Kingdom of Saudi Arabia

Ministry of Education

Northern Border University

College of Science

Department of Physics

جامعة الحدود الشمالية
NORTHERN BORDER UNIVERSITY
كلية العلوم

Quality System Manual

Second Version
1446 AH


بسم الله الرحمن الرحيم

Introduction

Based on the keenness of the Physics Department to integrate all its employees, including leaders, faculty members, students, technicians and administrators, in the processes of quality assurance and continuous improvement in accordance with the directions and policies of the Northern Border University, and in light of keeping pace with developments in the work environment and national transformation plans based on the Kingdom's vision 2030, and the Kingdom's responsibility And its leadership of great interest and care for higher education institutions to reach the national quality standards approved by the National Center for Academic Accreditation and Evaluation in all aspects of the educational and research process and the surrounding community service to achieve sustainable development. The Quality and Academic Accreditation Committee in the Physics Department unified the policies and procedures by designing the Quality System Manual for the Physics Program to represent an approach that clarifies and draws a comprehensive framework for the department's internal system for managing the

quality assurance operations of the program at the headquarter in Arar. To build this guide, the department relied on the Quality System Guide at Northern Border University, which is based on several references, the most important of which are the strategic plan 2025/2020, and standards quality assurance of institutional and program accreditation issued by the National Center for Academic Accreditation and Evaluation at the Education and Training Evaluation Commission. This guide includes four main chapters, which makes us put in your hands the first version of the Quality System Guide in the Physics Program, which represents the roadmap for managing the quality assurance and academic accreditation processes in the program to achieve the program's goals, the strategic goals of the university, the goals of the Vice Deanship for Development and Community Partnership, and the Deanship of Quality and Academic Accreditation.

We ask God Almighty to help and grant success

Quality and Academic Accreditation Committee

Department of Physics - College of Science - Northern Border University

Concepts and Terms

01 Quality:

It is conformity to certain requirements, specifications or characteristics that are able to meet the standards and requirements recognized in similar institutions.

02 Standards:

A way to judge something. A criterion is an adjective or rule used to evaluate, define, or categorize something, and it is also a level of evaluation.

03 Assessment:

Processes and procedures that aim to measure performance according to specific criteria and indicators.

04 External Assessment:

An independent review carried out by individuals or entities outside the organization to evaluate the activities, processes and quality standards adopted by the department.

05 performance appraisal:

It is intended to reach specific value judgments for activities through the use of some benchmarks that help in understanding and realizing the relationship between the various elements of the evaluation.

06 Program Evaluation:

The methods used to obtain the opinions of the beneficiaries of the program, with the aim of improvement and development.

07 External Resident:

A person from outside the department with experience in the field of specialization is invited to review the structure and content of the program and its relationship to educational outcomes, and the appropriateness of student assessment and grades, and compare this with the standard standards of the department.

08 Quality Committee:

A group of faculty members in the department is responsible for monitoring the progress of the program quality system within the department.

09 Self-Assessment:

It includes a set of procedures and steps carried out by the department in order to identify the reality achieved in the educational and teaching process at the level of the physics program, and compare that with the level desired by the physics department. It is the process of evaluating the department's performance by the department's employees themselves, by carefully analyzing, describing and diagnosing the current status of the institution's performance and identifying areas of strength and weakness in the light of specific criteria and according to the requirements of the accreditation body.

10 Quality Assurance:

It is an activity and a means to ensure that the requirements and standards required for the institution are met to achieve its goals and mission and to reach outputs that satisfy the labor market and the needs of society.

11 Priorities for Improvement:

After conducting a self-evaluation of quality and accreditation standards, it becomes clear a number of areas that need improvement, and of course the department cannot do all of them at the same time, so it identifies the important priority areas for improvement and clarifies them in the self-evaluation report.

12 Accreditation:

It means a set of procedures and processes carried out by the accreditation body in order to ensure that the department has met the quality conditions and specifications approved by the evaluation institutions. It is also known as a scientific institutional activity directed towards the advancement and upgrading of academic programs, and it is an effective and influential tool to ensure the quality of the educational process and its outputs and its continuity of development.

13 International Accreditation:

Accreditation of the program through an accreditation agency established in another country.

14 Program Accreditation:

That is, granting the program a certificate showing that it meets the standards required to provide an educational program in the field of physics at the required level.

15 provisional accreditation:

Temporarily accreditation of the program is on the basis of detailed plans. This provides an opportunity for the program to start working on this plan so that if these plans are implemented as proposed, the accreditation is likely to be granted.

16 Indicators:

They mean specific metrics that are used by the department to evaluate program performance.

18 Benchmarking:

Measuring the performance of the program in comparison with another body known for its excellence in the same field of the program and thus the department can determine the level of its achievement and work to improve its performance.

19 Evaluation:

The process of measuring the quality of performance in all activities with the aim of continuous improvement of future performance.

19 Field visit:

The visit carried out by the accredited external auditors for the purposes of evaluation and accreditation, during which the review and examination of all standards of quality and accreditation, and the evidence and performance indicators related to them, as contained in the self-study of the program.

20 Beneficiaries:

A group of people who have an interest in the quality of the program standards in terms of the effectiveness of the systems and processes put in place to ensure its quality, which is reflected in the quality and characteristics of the graduates of the program.

01 About the Physics Department

1.1 The Establishment of the Physics program

The Physics Department has offered a basic program since its inception in the academic year 1426/1427 AH, based on the approval of the Ministry of Higher Education No. 38 dated 5/26/1426 AH and the approval of the Honorable High Commissioner No. 10363/MB dated 08/22/1426 AH, which is a bachelor's program in physics It exists and is constantly being developed, so all its courses are taught in English. Therefore, the administration of the Northern Border University and the administration of the College of Science were keen to put all the capabilities and energies and provided all means for the program to come out with such distinction observed in its courses, learning outcomes and outputs in its graduate students. The program was also able to

contribute to providing the labor market with qualified graduates to work in various fields and within the framework of the strategy of developing study plans at the college in order to comply with modern developments in various sciences and meet the needs of the labor market in light of these changes. The program currently includes a number of faculty members in experimental and theoretical specializations. Various accurate in the field of physics, as well as a number of male and female teaching assistants, on scholarships, and a number of technicians qualified to work in the various physical laboratories.

1.2 Strategic framework for the Physics Program

1.2.1 Physics Department Mission

The Department of Physics seeks to provide advanced educational programs, and innovative scientific research that serve the community, meet the demands of the labor market and fulfill the aspirations of kingdom of Saudi Arabia.

1.2.2 Program Mission

To prepare highly qualified students in physics, through high quality education, learning experiences and scientific research to contribute to the community service and meet labor market needs.

1.2.3 Program Goals

1. To provide students with modern and up-to-date knowledge and skills in physics.
2. Enhancing students' critical thinking in research and solving problems.
3. To prepare graduates for the labor market by achieving the necessary professional attributes.
4. Preparing interdisciplinary training programs that develop research capabilities.
5. To activate effective partnerships with community service.

1.2.4 Attributes of the program graduates

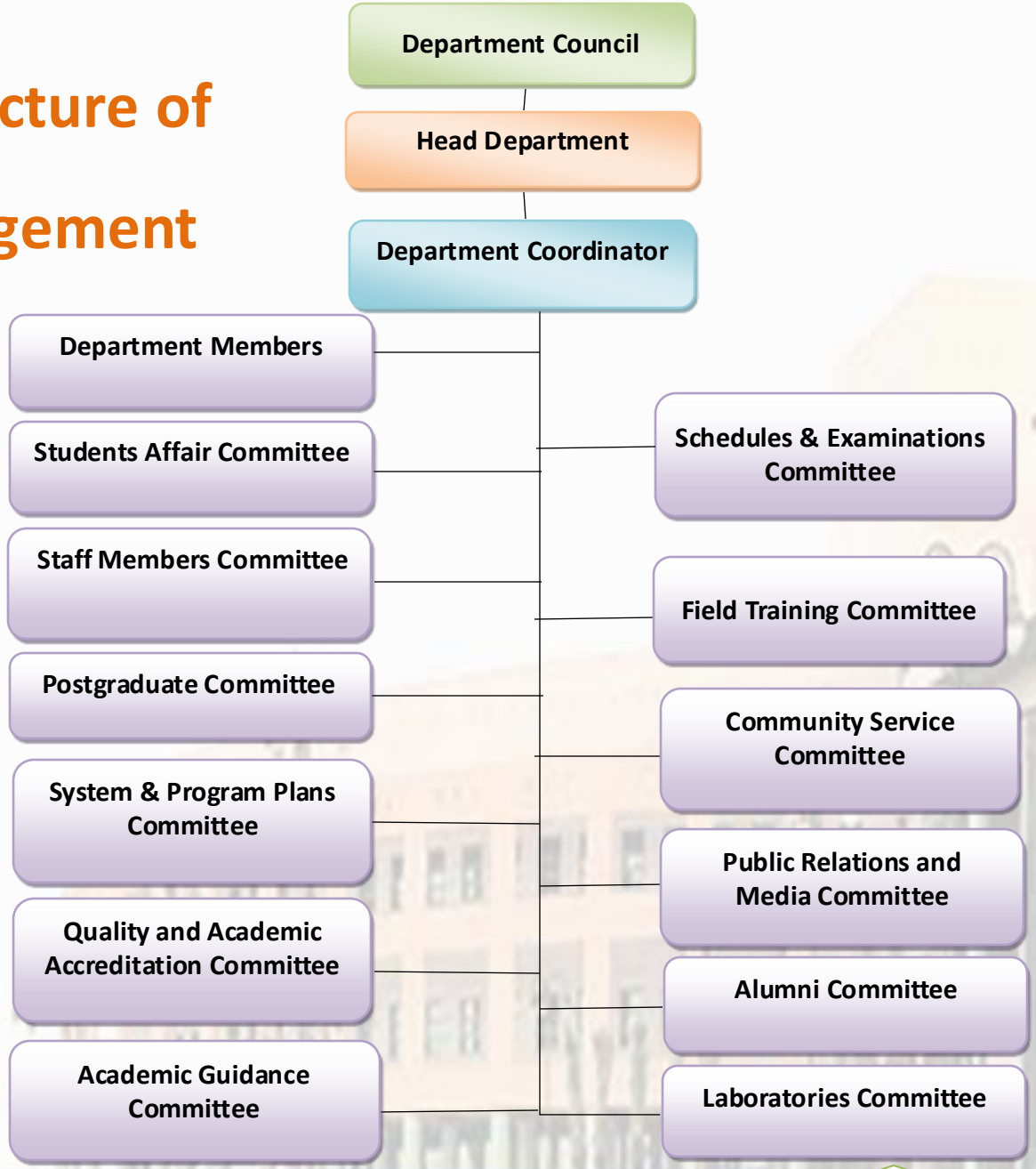
1. Identifies the basic concepts, principles, and theories in physics

2. Identifies, analyzes and solves physical, scientific and life problems using modern mathematical, statistical and technological methods, with his critical thinking skills.

3. Observes, measures and analyzes the results of a pilot test, extracts the most important results, writes them in a report and presents them in a convincing way.
4. Possesses the skills of self-learning and working as a team to achieve and achieve the desired goals.
5. Uses modern techniques and skills necessary for professional practice in his specialization.
6. Communicates well orally and in writing with team members and can lead that team to achieve specific goals and achieve targeted leadership.
7. Characterized by impartiality, integrity, objectivity, responsibility and independence.

1.3 Organizational Structure of Physics Program Management

- The Physics program is considered one of the distinguished academic programs offered by the Physics Department at the Faculty of Science, Northern Border University, and it is offered at the headquarter in Arar in its male and female branches. The decisions of the Councils of the College of Science and the Department of Physics regarding academic and technical matters are binding and enforceable in both branches.



02 Quality Management System Methodology for Physics Program

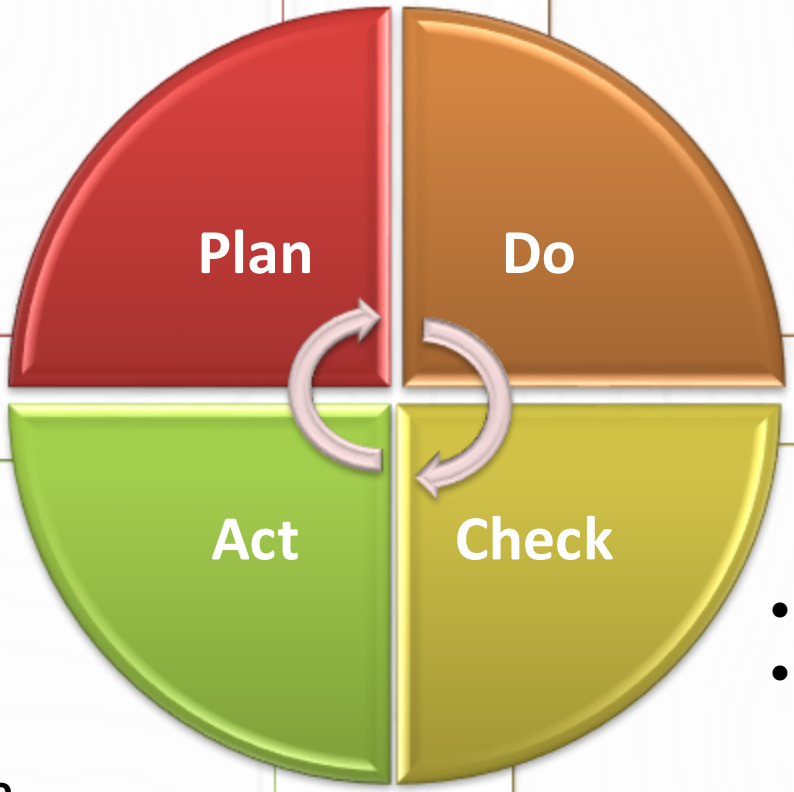
- The methodology of the quality management system for the physics program is as follows:

- Operations management using the Plan-Do-Check-Act (PDCA) methodology: Operations are activities that interact with each other to transform inputs into outputs with added value, and the activities of a single process may involve more than one entity within the program, and the operations approach focuses on functional integration and not functional specialization The process approach is the systematic management of operations and their interactions to achieve the desired goals and results.

- Operations management and the system as a whole can be achieved using the "Plan-Do-Check-Improve" methodology (PDCA), which is known as the Deming Cycle, as shown in the following figure:

- Planning process:
- Vision
- Strategic goals
- performance indicators
- implementation plan

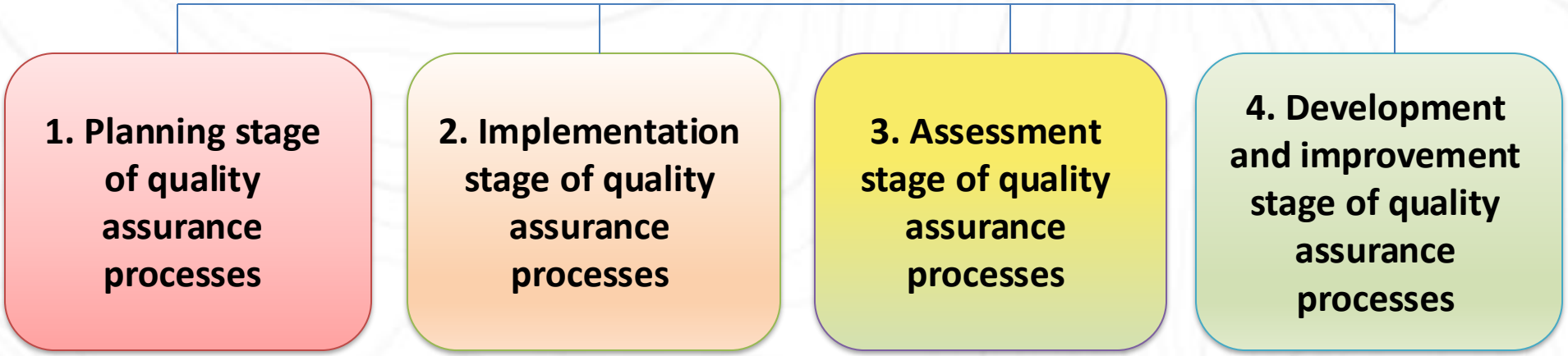
- Implementation process:
- Execution of the plan



- Improvement process:
- Make decisions to improve and start the cycle over

- Assessment process:
- Measuring performance indicators
- periodic reports

- This methodology can be applied to the Physics Program as a comprehensive work methodology in all its practices. It ensures the participation of all its employees, including academics, employees, students, as well as representatives of the local community, in quality assurance processes at all stages. The participation of beneficiaries in general in the four stages of quality processes can be reviewed as follows:



2.1 Planning stage of quality assurance processes

- Faculty members in the Physics program participate in planning quality assurance processes, course descriptions, and planning processes for measuring the educational outcomes of the Physics program and its courses.

- Many faculty members and administrators also participated in developing the previous strategic plan for the physics program, as well as procedures for setting the current strategic plan for the program, identifying issues and strategic priorities, evaluating the initiatives submitted by faculty members, administrators, students and beneficiaries, and determining their priority according to their link to the objectives of the program's strategic plan.

- The faculty, administrators and students also participated in providing comments on the basic document of the strategic plan of the program.

2.2 Implementation stage of quality assurance processes

- Physics program employees participate in the implementation of quality assurance processes through their membership in the various committees, which are the Quality and Academic Accreditation Committee, the Academic Guidance Committee, the Schedules and Exams Committee, the Systems and Study Plans Committee, the Student Affairs Committee, the Faculty Affairs Committee and the like, the Graduate Studies Committee, the Field Training Committee, the Alumni Committee, and the Laboratories Committee The Community Service Committee, as well as the Public Relations and Media Committee.

2.3 Assessment stage of quality assurance processes

- All beneficiaries participate in evaluating the quality assurance processes for the physics program by responding to questionnaires measuring the satisfaction of the beneficiaries, whether they are faculty members, technicians, administrators, students and representatives of the local community.
- The head of the department receives faculty members, staff, students and external auditors to receive direct observations, complaints and suggestions for study and guidance in evaluating the performance of the various committees and working to improve them.

2.4 Development and improvement stage of quality assurance processes

- Continuous improvement is done using standards matching to identify the gaps and then improvement plans are developed to reduce the gaps and improve performance, and continuous improvement should be a permanent goal of the physics program.
- The auditors must be familiar with the specifications of the reference standards, and have mastered auditing methods and tools in order to identify problems and gaps for improvement and development. The external recognition represents an acknowledgment of the quality of the operations and the adequacy of improvement plans for the physics program, and represents a continuous impetus for development as the recognition is renewed according to a specific periodicity. This is done by directing the various committees to prepare plans for improvement and development based on the results of questionnaires measuring the satisfaction of beneficiaries and evaluation studies with the aim of development and improvement.

03 Internal Quality System for Physics Program

3.1 Objectives of establishing the internal quality system for the physics program

1. Evaluation of the current status of the quality processes in the program (self-study) based on quality standards and academic accreditation.
2. Monitoring and correcting the application of quality requirements and academic accreditation in the department and program.
3. Develop continuous improvement plans as required by the requirements of the National Commission for Academic Accreditation and Evaluation.
4. Developing the capabilities of faculty members and identifying their training needs in the program to enable them to prepare program descriptions, courses and various periodic reports.

5. Ensuring the achievement of an appropriate level of quality in the Physics Department, through which beneficiaries and employers are assured that the level of quality is appropriate and achieves their aspirations.
6. Communication and transfer of knowledge and experiences between faculty members in the various scientific programs at the College of Science.
7. Working on the use of appropriate scientific methods for collecting and processing statistical data, calculating performance indicators, and establishing the databases required to provide evidence and proofs to judge quality practices.

3.2 Quality Standards for Program Accreditation

- The National Center for Academic Accreditation and Assessment has developed a set of standards to ensure the quality and accreditation of higher education programs. These standards cover six areas, and the following are the main standards:

1. Mission and goals
2. Program management and quality assurance
3. Education and learning
4. Students
5. Teaching Staff
6. Learning resources, facilities and equipment

- The Physics program enhances its ability to meet these standards through the document of self-evaluation standards for academic programs (for the undergraduate stage) prepared by the National Center for Academic Accreditation

and Evaluation, which aims to provide assistance in conducting the evaluation in an objective manner, and can also be used in the field of planning and internal auditing, and supporting strategies Quality improvement in physics program.

- The Physics program uses the list of evidence and evidence proposed for program accreditation criteria prepared by the Deanship of Quality and Academic Accreditation at Northern Border University to guide it when preparing the program's self-evaluation scales as well as when writing a self-study report. The program adds some evidence and proofs that it deems appropriate, as the Deanship indicated this possibility.

3.3 Programmatic Performance Indicators (KPIs)

- The Physics program uses specific KPIs approved by the National Center for Academic Accreditation and Assessment (for the academic program).
- The National Authority system requires academic programs to use 70% of the 17 KPIs. .You can refer to the following QR for more information on the key performance indicators for academic programs

- Specific and approved KPIs are extracted from the Education Evaluation Authority at least once every academic year.

3.4 Questionnaires approved by the National Center for Academic Accreditation and Assessment

- The Physics Program uses the 6 questionnaires established by the National Center for Academic Accreditation and Assessment:

1. Program Evaluation Questionnaire (Last Level Students in Physics Program)
2. Course evaluation questionnaire
3. Student experience questionnaire
4. The graduates' questionnaire including (the graduates' opinion about the characteristics of the graduates and the learning outcomes of the physics program, field experience, and extra-curricular activities)
5. Employers' and employers' satisfaction questionnaire about the characteristics of graduates and the learning outcomes of the physics program
6. A questionnaire for students' achievement of the learning outcomes of the periods of field experience

- You can refer to Chapter Five of the Internal Quality Assurance System Manual at Northern Border University, which includes the details of the quality system for program accreditation through QR :

04 Quality processes in the physics program

Quality processes have been limited to the physics program in various fields, including enhancing the quality of the educational program, raising the efficiency of academic guidance, raising the efficiency of scientific research, and improving the quality of support services, which include the areas of activity of the quality assurance system in the program, education and learning, scientific research, community service, and areas of administrative services. which will be reviewed as follows:

4.1 Quality management in administrative processes

The Physics Program believes in the importance of the quality of administrative processes and in order to achieve its mission and goals, it has worked to ensure the quality of administrative processes in accordance with total quality management systems and used the "plan-Do-check-Act" methodology with the aim of simplifying administrative procedures and understanding each individual's role in the administrative system and his easy understanding of the tasks his job and the implementation of the tasks with ease and ease, with high efficiency and in the least possible time and in a positive, appropriate atmosphere characterized by comfort and achievement, which is reflected in the results of their evaluation, program development and provision of data and statistics necessary to support decision-making.

4.1.1 Administrative Quality Management System Methodology

The Physics program uses Deming's approach to quality management, which is "plan-Do-check-Act" which gave the program clear specific steps and procedures to ensure the quality of all steps and stages.

1. **Plan**

The program developed a strategic plan for the current year.

2. **Do**

The program management is committed to the executive plans attached to the strategic plan, which are related to administrative operations.

3. Check

The executive plan clarifies those responsible for executing the task, and the program monitors the extent to which the performance indicators established in the executive plan attached to the strategic plan are achieved. Those responsible for implementation submit periodic reports on the percentages of achievement and obstacles.

4. Act

The program monitors the implementation rates and takes immediate decisions about delays beyond the dates specified in the implementation plan.

4.2 Quality management in teaching and learning

4.2.1 Study Systems and Plans Committee in the program

The committee is formed at the level of the physics department to build, design and review the plan and program or to develop them. The committee has the right to seek the assistance of specialized experts from outside the physics department or from outside the university as needed after completing the procedures followed in that.

4.2.1.1 Tasks of the Study Plans and Systems Committee in the program

1. Building new study plans and reviewing their descriptions with reference to the reference framework approved at the university.
2. Reviewing and developing the study plan for the existing physics program.
3. Supervising the preparation of course reports at the end of each semester, studying the extent to which the course learning outcomes have been achieved, and proposals for improvement and changes proposed by course professors (if any) and submitting them to the department council to take the appropriate recommendation.

4. Supervising the preparation of the annual report of the physics program, studying the extent to which the learning outcomes of the program have been achieved, the strengths and weaknesses, and suggestions for improvement and proposed changes, and submitting them to the department council to take the appropriate recommendation.
5. Study all the proposals submitted to it to improve the quality of the program and complete the necessary procedures in this regard.
6. Providing opinion and advice on everything that would improve the quality of the program.
7. Periodic review and evaluation of the program and study plan in the department.
8. Any other tasks assigned to it in this regard by the Dean of the College of Science or the Vice Dean for Academic Affairs.

4.2.1.2 The role of the department council to support the tasks of the systems and study plans committee in the program

1. Study the program and study plan submitted by the committee and submit written visuals to it.
2. In the event that some or all of them are not taken into consideration by the committee, or if opinions differ, the department refers the disputed topic to the Committee on Systems and Study Plans at the College of Science, and in the event that each of them remains on their opinion, the matter is referred to the College Council.
3. Recommend approval of the study plan, and refer it to the Study Systems and Plans Committee at the College of Science to be presented to the College Council to recommend approval and submit it to the Standing Committee for Study Systems and Plans.
4. Suggesting study plans, academic programs, curricula, references, and books prescribed to the Systems and Study Plans Committee at the Physics Department.

4.2.2 Steps to design or develop the program

4.2.3 Program periodic review procedures

4.2.4 Permissions to modify the program

The Physics program follows all the approved steps and stages described in the guide for designing, developing and reviewing academic programs at Northern Border University. The guide can be viewed through the following QR:

4.2.5 Performance Measurement and Evaluation Standards (Evaluation Circuit) for the Program

The evaluation of the physics program, according to what was approved by the University of Northern Borders, to achieve consistency with the requirements of the Saudi Qualifications Framework (SQF), depends on two main mechanisms:

4.2.5.1 Direct Evaluation Mechanisms

It includes various methods and processes of evaluation and direct measurement to measure the characteristics and learning outcomes of the Physics program graduates and all of its courses, including the graduation project course and field experience.

4.2.5.2 Indirect evaluation mechanisms

The methods and processes of evaluation and indirect measurement include evaluating the learning outcomes of the program by surveying the opinions of the beneficiaries of the physics program through 6 questionnaires to survey the opinions of the beneficiaries provided by the Agency for Development and Quality at the university (mentioned in item 3.4)

4.3 Quality management in scientific research

The quality management system and its government in the field of scientific research depend on the main methodology (PDCA), which depends in achieving process management and the system as a whole on the use of the "plan-Do-check-Act" methodology, and this is done through the main steps represented in the following:

1. Plan

- The Physics program sets the scientific research plan in line with the strategic plan of the university, provided that it includes the following:

- Environmental analysis of the program to determine the current status of scientific research and research services.
- The objectives of the scientific research according to the results of the environmental analysis and the operational plans to achieve those objectives.
- An integrated study of the strengths, weaknesses, opportunities and challenges, and the policies and procedures required by the study in line with the beneficiaries of the service.

2. Do

- This step depends on the implementation of all executive plans for scientific research for the physics program in line with the executive plans for scientific research at Northern Border University, and this is done by implementing the following procedures:

- Develop clear mechanisms with the priorities of scientific research to keep pace with global developments in line with the needs of society.
- Involve students in the physics department in research projects to develop their skills in the field of scientific research.
- Improving the publication rate of scientific research for one member to exceed at least two research papers during the current year. Forming research groups that cooperate with universities and external institutions to exchange experiences between researchers.
- Expansion of laboratories and research laboratories needed by different specializations Serving the community and the surrounding environment and working to help solve its problems through various research projects.

3. Check

This step depends on the following:

- Periodic follow-up by the Deanship of Scientific Research at the university to ensure that the objectives of scientific research are achieved in line with the strategic objectives of the university.
- Periodic follow-up of the implementation stages of the executive plans for scientific research.
- Ensuring the achievement of performance indicators for the implementation plans of scientific research

4. Act

This step depends on making improvement decisions according to the current status of scientific research, to raise the status of scientific research in the program in line with the strategic goals of the university.

4.4 Quality management in community service

The quality management system and its government in the field of community service and community participation relies on the main methodology (PDCA). This methodology depends in achieving operations management and the system as a whole on the use of the "plan-Do-check-Act" methodology, and this is done through the main steps represented in the following:

1. Plan

The Physics program sets a plan for community service and community participation in line with the strategic plan of the university, provided that it includes the following:

- Strengthening the societal relationship between the program and the various community bodies.

- Strengthening the relationship with the students of the program, which contributes to raising the educational level of the university's external community.
- Consolidating values and principles in the community and spreading the culture of community participation and volunteer work to improve the work environment and raise community awareness.
- Working on the implementation of protocols and agreements for community cooperation and community participation with various institutions, government and private agencies, and the local community.
- Encouraging program employees to volunteer to expand community participation to serve the community.

2. Do

- This step depends on the implementation of all executive plans to serve the community, and this is done through the implementation of the following procedures:

- Spreading the culture of quality in community service among the program's employees and the importance of social participation and developing a sense of belonging to the community and the nation.
- Develop mechanisms to stimulate and encourage community participation. Encouraging program employees to volunteer and presenting initiatives that contribute to the consolidation of community relations with the university.
- Introducing community service mechanisms to keep pace with societal developments and changes.

- Develop a plan for using the program's resources to contribute to community service according to studying the community's needs and setting priorities.
- Executing projects and supporting initiatives submitted by program employees that serve this community.
- Supporting the various activities provided by the program to develop students' skills and awareness of their duties and obligations in the work contributing to community service.
- Encouraging teamwork and benefiting from the various experiences available in the program to achieve goals related to community service and community participation.

3. Check

- This step depends on the following:

- Periodic follow-up of the program to ensure that the goals of community service are achieved in line with the strategic goals of the university.
- Periodic follow-up of the implementation stages of the executive plans for community service.
- Ensuring the achievement of performance indicators for the executive plans for community service.

4. Act

This step depends on making improvement decisions according to the current situation to serve the community, to raise the level of community relations in the program in line with the strategic objectives of the university.

- References

1. Education and Training Evaluation Commission -The National Center for Academic Accreditation and Evaluation.

2. The internal quality assurance system of the Northern Border University.

3. The guide for designing, developing and reviewing academic programs at Northern Border University.

- Communication with the Physics Department

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