



Electrical Engineering Program Quality Assurance Manual

Prepared by: Quality Committee

August 2022

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Kingdom of Saudi Arabia
Ministry of Education
University of Tabuk



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Abbreviations

UT	University of Tabuk
EE	Electrical Engineering
NCAAA	National Commission for Academic Accreditation & Evaluation
KPI	Key Performance Indicator
PEO	Program Educational Objectives
PO	Program Outcomes
PLOs	Program Learning Outcomes
KSA	Kingdom of Saudi Arabia
NQF	National Qualification Framework KSA
TQM	Total Quality Management
APR	Annual Program Report
AES	Alumni evaluation survey
PES	Program evaluation survey
CES	Course evaluation surveys
SES	Student experience survey
EES	Employer Evaluation survey
LRSS	Learning Resources Satisfaction Survey

1. INTRODUCTION

The Bachelor of Science in Electrical Engineering (B.Sc. in EE) Program at the University of Tabuk is committed to continuous improvement in all aspects and has been implementing UT's well-established strategies for total quality management (TQM) since its inception.

The purpose of this quality manual is to:

- Act as a concise information hub for the quality assurance of the B.Sc. in Electrical Engineering program.
- Emphasize the crucial quality management policies, guidelines, and procedures that assist the BSc in EE program in accomplishing its objectives.
- Guarantee high-quality practices across all areas, the attainment of the program's mission and objectives, the required tasks following the respective deadlines, and program accreditation.

As the program obtains all its directives, comprising policies, procedures, and quality practices from the university, this handbook has been developed by following the university's Programs Quality Assurance System manual as a reference.

2. Vision, Mission, and Goals:

Mission of The University of Tabuk

To offer a distinguished university education that meets the needs of society and the job market through an attractive educational, administrative, and technical environment that supports research and innovation.

Mission of the Faculty of Engineering

To graduate qualified engineers in accordance with the International Academic Standards and prepare them to meet the changing needs of society. These graduates will be able to compete locally and internationally. The Faculty of Engineering is committed to providing excellent education and pursuing relevant scientific research and partnership with industry and governmental societies.

B.SC. in EE Program Mission:

To offer a comprehensive education that develops technical and professional engineering skills, instills moral values and ethical behavior, and motivates and prepares students to engage in research and community service.

B.SC. in EE Program Goals:

1. Produce competent Electrical Engineers.
2. Inculcate moral values and professionalism among students.
3. Engage students in community services.
4. Empower graduates to contribute towards economic prosperity of the country.

3. Definitions in the Quality Manual:

Quality: It is satisfying the requirements of the customer who invested in the product or service, and it is about being fit for the purpose for which the product or service was purchased.

Academic quality: Academic quality is a way of describing how well the learning opportunities available to students help them to achieve their awards. It is also about making sure that appropriate and effective teaching, support, assessment and learning opportunities are provided for them.

Academic standards: Academic standards are a way of describing the level of achievement that a student must reach to gain an academic award (for example, a degree). It should be at a similar level across the Kingdom.

Quality assurance (QA): Quality assurance refers to a range of review procedures designed to safeguard academic standards and promote learning opportunities for students of acceptable quality.

Quality system: A quality system, also known as a Quality Assurance (QA) system or a Quality Management System (QMS), is a management system that helps to ensure the consistency of quality of the goods or services (education) that are supplied. Compliance with Quality System Standards is demonstrated by completion of a successful quality system audit conducted by a certified organization recognized by the Government which is in our case: The National Commission for Academic Accreditation & Assessment (NCAAA).

Policies: A policy is a statement stated to guide decision-making based on the framework of the institution's objectives, goals, and management trends.

Procedures: A procedure is a "documented process": a series of prescribed steps which are followed in a specific regular order to secure adherence to the guidelines set in the policy the procedure adheres to. It describes the process: "who" does "what" and "when" "under what criteria" in a specific sequence.

Activity/ Task: These are work instructions that describe how to accomplish the process. An activity is an action representing a step in the procedure. A task is a detailed description of an activity.

Forms: These are documentations used to create records, checklists, surveys, which constitute the basis of the process communications, audit materials, and process improvement initiatives.

Records: These are the critical output documents of any procedure.

Program Learning Outcomes (PLOs):

The EE department has adopted the EE program learning outcomes in accordance with NCAAA. The definition and the required revisions of the PLOs were discussed initially in the Quality Committee followed by further discussions in the EE Department Council, which was then approved in the department council meeting.

Periodic Review of the PLOs:

The B.Sc. Electrical Engineering program has established a robust system for the periodic review of its program learning outcomes (PLOs). This systematic process involves monitoring of changes in the program's mission, accreditation body requirements, and academic standards. Additionally, the program actively solicits feedback from stakeholders through regular meetings with the program advisory board and the periodic administration of satisfaction surveys. The insights gleaned from these comprehensive reviews serve as a cornerstone for ensuring the continuous enhancement of the PLOs, aligning them with evolving industry needs and the dynamic landscape of academic expectations.

PLOs of the B.Sc. in Electrical Engineering Program:

The following table illustrates the list of PLOs of the B.Sc. in EE Program:

Table 4-1: EE Program Learning Outcomes

PLO(K1)	Demonstrate knowledge and comprehension with both breadth and depth in the underlying theories, principles, and concepts of electrical engineering and science.
PLO(S1)	An ability to identify, formulate, and solve complex engineering problems by applying principles of electrical engineering, science, and mathematics.
PLO(S2)	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
PLO(S3)	An ability to develop and conduct appropriate experimentation, analyze, and interpret data, and use engineering judgement to draw conclusions.
PLO(S4)	An ability to communicate effectively with a range of audiences.
PLO(V1)	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
PLO(V2)	An ability to function effectively on a team, whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
PLO(V3)	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The assessment of program learning outcomes is performed every semester using pieces of students work especially designed to assess some specific course learning objectives and consequently specific program learning outcomes.

The PLOs are published in the Electrical Engineering department web site.

<https://www.ut.edu.sa/en/Faculties/engineering/>

4. The National Commission for Academic Accreditation & Assessment (NCAAA)

The National Commission for Academic Accreditation & Assessment has been established by the Higher Council of Education in Saudi Arabia with responsibility to establish standards and accredit institutions and programs in post-secondary education.

The system for quality assurance and accreditation is designed to support continuing quality improvement and to publicly recognize programs and institutions that meet required quality standards. The objective is to ensure quality across six predefined standards in all post-secondary institutions and in all programs offered in Saudi Arabia.

The Five Standards of NCAAA work to ensure that quality guides all policies, procedures, and practices in the following:

1. Program management and quality assurance
2. Teaching and learning
3. Students
4. Faculty members
5. Learning resources, facilities, and equipment

The program has adopted the five quality standards as well as the National Qualification Framework (NQF) standards to ensure effective quality practices at all levels and in all domains. These quality standards and processes are also in place to ensure that the mission, goals, and program learning outcomes are derived from and consistent with that of the University, faculty, and NQF.

The Quality Committee of the B.Sc. in Electrical Engineering Program works in a systematic way to ensure compliance with best practices and quality standards as stated in the NCAAA Standards for Program Accreditation.

5. Faculty of Engineering Organization Structure

The organizational structure of Faculty of Engineering is built in accordance with its vision, mission and goals and based on the efficiency of the human and financial resources in the faculty.

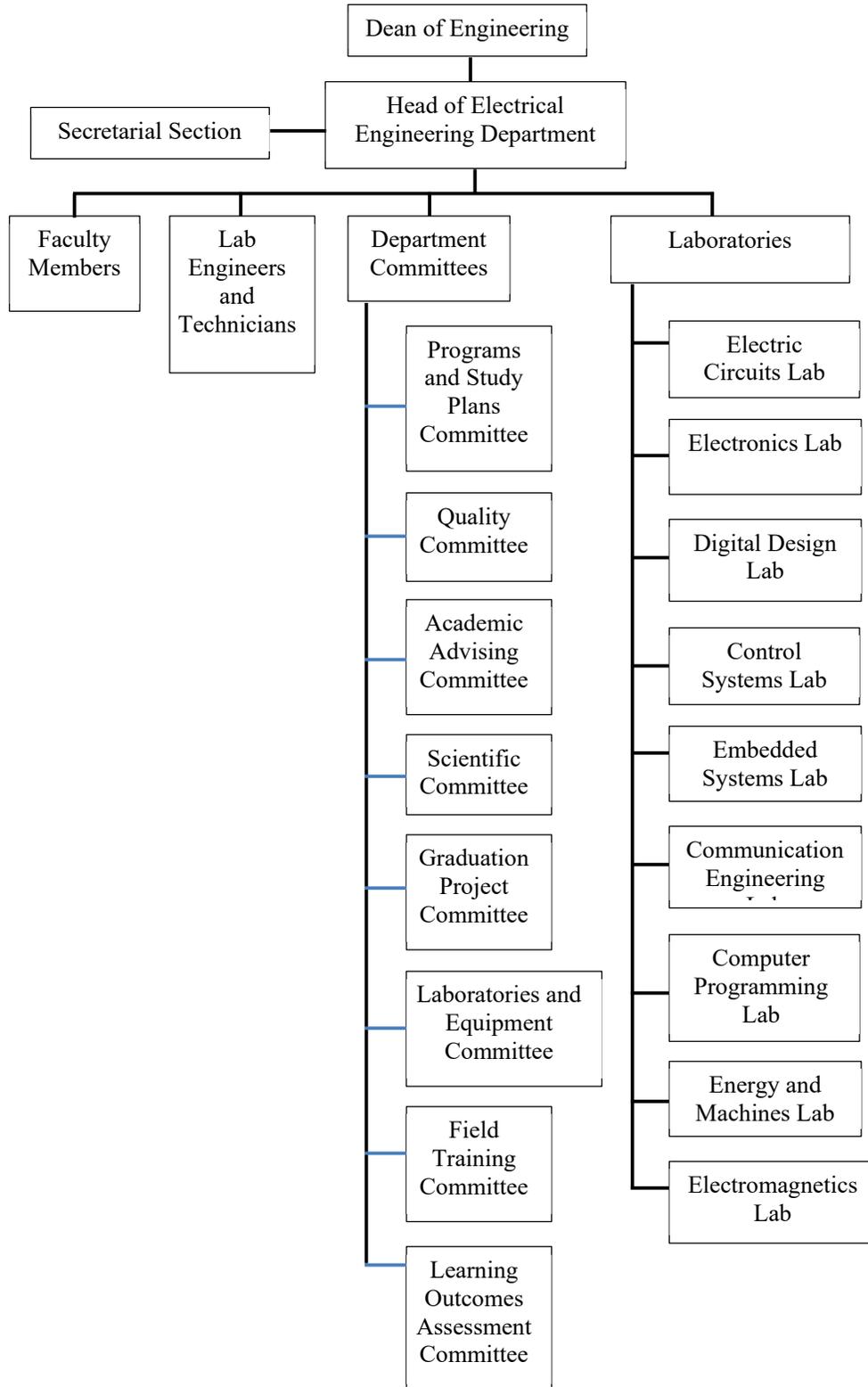
Mission of Faculty of Engineering is “To graduate qualified engineers in accordance with the International Academic Standards and prepare them to meet the changing needs of society. These graduates will be able to compete locally and internationally. The Faculty of Engineering is committed to providing excellent education and pursuing relevant scientific research and partnership with industry and governmental societies.”

For building the organizational structure, the faculty went through several stages, starting with defining the faculty’s objectives and preparing detailed lists of activities by deanship, vice deanships, academic departments; and then defining the organizational relationships connecting them together at different levels vertically and horizontally, then defining the communication network that allows the exchange of information, then drawing the organizational structure, and then preparing job description in a guide that explains the competence, tasks and functional relationships, and finally monitoring the organization process on a continuous basis. Accordingly, the below Faculty of Engineering organizational structure (Figure 1) shows the deanship, academic departments, vice deanships, and committees and the relationship between them and lines of authority and the responsibility that links the parts of the faculty and the dimensions of the scope of supervision.

Their job description, authorities, and affiliation are described in details in the

[*Guide for tasks and duties of Deanship, vice deanships, and committees*](#)

Organizational structure of B.Sc. in EE program:



6. Concept of Quality Planning and Review Cycle

The process of quality improvement involves assessing current levels of performance and the environment in which the programs are operating, identifying strategic priorities for improvement, and setting objectives, developing plans, implementing those plans, monitoring what happens and adjusting if necessary, and finally, assessing the results achieved. These steps involve a repeating cycle of planning and review. Major plans may involve a sequence of activities over several years, with several steps to be taken and the results of each step assessed at stages within that long-term plan. While the monitoring should be continuous, there are normally two time periods when more formal assessments take place; one is annual with monitored performance and adjustments made as required, and the other is on a longer cycle in which major reviews are undertaken. Issues related to quality assurance and accreditation assessments should be planned to coincide with the five-yearly external reviews for accreditation and re-accreditation conducted by the NCAAA.

Program Planning

UT published the first version of the procedural guide for programs and study plans in the academic year 2014/2015. The second updated version was published in 2019/2020 and the third updated version was released in 2021. The guide contains all procedures for the programs' establishment, accreditation, forms, and all other procedures. All programs in UT should be committed to UT policies, standards, and procedures that are published in the manual. ([UT Procedural guide for Programs and study plans](#))

The B.Sc. in EE program is committed to the institutional policies, standards, and procedures in the design, development, and modification of the curriculum. Introduction of a new program in UT starts with assessing the needs for this program, followed by preparing a program specification document that specifies the main program objectives, learning outcomes satisfying the NQF domains, teaching

strategies, and assessment methods to measure the PLOs.

All course specifications are then prepared according to the NCAAA standards and forms and updated accordingly. Appropriate learning outcomes for each course as well as teaching strategies and assessment methods and the distribution of the course topics are developed. Courses are prepared to achieve program goals and learning outcomes. The teaching and learning methodologies followed in each course are according to those stated in the course specification, which is considered as a contract between the instructor and the students. At the beginning of each semester, course instructors are responsible for reviewing their respective course reports from the previous semester, as well as the recommendations of the previous instructor of the course. They should also consider all issues related to the course and the results of previous improvement plans. Based on this information, they can plan for course delivery, check facilities and resources, and distribute tasks and responsibilities. Throughout the course, the course coordinator continuously monitors all course activities, ensuring the plan for delivery of the course is followed and facilitates difficulties and overcome obstacles faced during its delivery, gathering evidence for completion of course file and completing the course report. After the final assessment and release of exam results, the course coordinator discusses the results and Course Evaluation Survey analysis with the program chair. The coordinator also receives feedback from instructors and finalizes the course report and the course binder. Finally, the coordinator submits the course binder and the course report, which contain recommendations for improvement and an action plan. The course reports are prepared using NCAAA forms and provide an opportunity for the instructors to highlight issues they experienced or noted related to the effectiveness of the planned teaching strategies, and the extent to which the intended learning outcomes had been achieved.

The B.Sc. in Electrical Engineering program annually evaluates the feedback from beneficiaries to ensure that the program is achieving its mission and goals. Feedback is provided to all faculty members, course coordinators and administration. The course and program reports are used annually to assess the quality of education and

any obstacles facing the quality of this process.

Proposed changes are presented, discussed, and approved according to the type and percentage of changes to the authorized level as stated in the UT procedural manual for programs and study plans.

Intended Changes	Level of Approval						
							
	Department Council	Faculty Programs & Study Plans Committee	Faculty Council	UT Management of programs & study plans	UT Standing Committee of Programs and Study Plans	UT Council	Ministry of education

The levels for approval changes in UT courses and programs are summarized in table (1). Any modification in the program plan must be documented and approved. The B.Sc. in EE program strictly follows the university regulations in this concern.

Table (1): Levels for approval of changes in UT courses and programs.

Intended curriculum changes	Final Level of Approval
Program Level	
Changes including a program's mission, objectives, title, program length (total number of years/levels/ hours), program learning outcomes, program specification, study plan, and adding co-requisites, or prerequisites	UT Standing committee of programs and study plans
Changes in ordering of PLOs, program KPIs, course code	Administration of Academic Programs and Study Plans in UT.
Change in the facilities, operational plan, dropping program co-requisites or pre-requisites	Faculty Council
Course Level	
Changes in the title, credit hours, length of period for teaching, timing in the program plan, update of course specification affecting >25% of CLOs, language of teaching	Standing committee of programs and study plans in UT
Course code	Administration of Academic Programs and Study Plans in UT.
Changes in course policies and regulations	Faculty council
Course teaching strategies, <25% change in CLOs, textbooks, reference materials, updates in electrical engineering knowledge in related topics, distribution of topics/weeks, methods for assessment; measurement and evaluation grading systems.	Department Council

7. Course planning, implementation, delivery, and reporting

The Course Coordinator is the leader in successful implementation of Integrated curriculum. At the program level, the Course coordinator is responsible for ensuring effective management of the course, its conduction according to what is stated in the course specification, by analyzing the teaching, learning and assessment strategies used by the course instructor (s). The coordinators ensures whether the instructor has properly used the methods specified in course specifications to achieve the course learning outcomes and the aligned program learning outcomes. The course coordinator is also responsible for ensuring that the instructor has delivered and managed the course by following the Faculty and University educational policies and regulations. The course coordinator is responsible for maintaining, updating all course data and information (course specification, course report etc.) to assure that this information will help other parties for governing program planning, implementation, and evaluation.

Responsibility of Course Coordinators and Instructors

- Actively participate in all course activities in all its phases (planning, implementation, evaluation, and improvement).
- Act professionally within the team of instructors.
- Chairing the course team and arranging for course meetings (Pre and post course meeting).
- Supervise all the tasks and activities of the course team.
- Ensure that the course is conducted as scheduled with adherence to the schedule and teaching plan.
- Communicate regularly with the students to monitor any deviation from the teaching schedule.
- Ensure that all course documents are prepared and go through the appropriate approval procedures.

- Deal with questions and problems related to the course conduction and management.
- Ensure that all educational materials, resources, and facilities are ready when required for the students and teaching staff.
- Work with the relevant committees to create efficient systems to support the delivery of the course.
- Ensure that the course is being run in accordance with general faculty and university guidelines.
- Ensuring that all academic staff teaching the course are clearly and well informed by what is required from them through group and/or individual meetings as appropriate.
- Ensure that the students are oriented with the course learning outcomes, contents, teaching and learning strategies, assessment methods, required educational resources, student support and counselling and their roles in course evaluation and improvement.
- Clarifying the course requirements and the assessments methods for the students at the beginning of teaching every course
- Provide ongoing guidance to teaching staff of the course and deal with any problems that arise.
- Provide ongoing guidance to the students and deal with any questions and problems.
- Monitor the progress of the course and provide feedback to teaching staff and the students if required.
- Monitoring the commitment of the teaching staff to implementing the teaching strategies and the approved assessment methods mentioned in the course specification.
- Encourage instructors to exchange ideas and provide support for each other.
- Clarifying the requirements of students' attendance in the course and monitoring the extent of their commitment

- Monitoring the attendance and counselling for their better performances
- Preparing and updating course documents and materials
- Update course specification based on previous course report, NCAAA templates and guidelines, and recommendations and feedback of the Quality Committee.
- Put and follow up course timetable including all teaching and practical training activities besides teaching and simulation session.
- Updates student's study guide, and active teaching materials
- Implement and monitor course improvement plan.
- Assuring high quality student assessment
- Setting up a clear plan for post exam tasks as marking and correction of exam papers, discussion of the students' results, approval of the student grades and finally setting a recommendation for improvement.
- Collecting feedback on the course from a variety of sources, including students through electronic surveys, teaching staff, and other staff, to identify areas for improvement, both in terms of syllabus and materials design and administrative systems.
- Measurement of achievement of CLOs and verify the students' achievement levels, their grades distribution, and their program completion rate in coordination with Quality Committee.
- Collecting the data is essential for the preparation of course report.
- Analyzing the feedback and statistical data and report on the course
- Identifying the training needs related to the course.

8. Program Quality Assurance and Review Cycle:

Course Level:

At the end of each course, the course coordinators submit the course binders, including the course reports on the NCAAA forms. The minimum requirements for annual course evaluation should include a summary and analysis of the final marks of students with comments on grade distribution, item analysis, measurement of the achievement course learning outcomes (CLOs), effectiveness of planned teaching and assessment strategies for CLOs, course evaluation by students and other evaluators, and an action plan for improvement that may include rising issues or proposals for change.

1. Course reports are prepared by the course coordinators on NCAAA forms.
2. The Program Quality Committee reviews (and revises if required) the submitted course reports and checks their completion and prepares a collective report on the completion status and on the plan of improvement in the submitted reports.
3. The collective report is discussed and approved by the department council meeting.
4. The Course Reports are also submitted electronically to the Deanship of Development and Quality through Meyar Plus.
5. The Deanship of Development and Quality reviews all the submitted reports and ensures that they fulfill the requirements of program accreditation and then submits them to the higher standing committee of academic accreditation and quality assurance.
6. The higher standing committee of academic accreditation and quality assurance revises the course reports and ensures the fulfillment of the CLOs and sends its recommendations to the deanship of quality and development.
7. The deanship of development and quality sends the recommendation to the

program coordinator for follow up.

8. The program coordinator sends the recommendations to the concerned departments, course teams, and committees for execution, follow up of implementation of the improvement plan with supporting entity if needed and the results are recorded in the course report of the next academic year.

2. Program Level

The quality management of the program is implemented through the PDCA cycle and monitored on a regular basis using an appropriate evaluation mechanism in order to support the continuous improvement of program and its activities and ensure that it is achieving its mission, goals and learning outcomes.

Steps of the Program Assessment Process.



- i. The course coordinators submit the finalized approved course reports to the Quality Committee.
- ii. The Quality Committee forms a team and puts and approves the operational plan for writing the annual program report (APR). The operational plan encloses the distribution of tasks, the coordination of meetings, writing and finalization of the APR. The APR summarizes the quality of the program performance and sets action plans for improvement of the educational process and other processes.
- iii. The Quality Committee reviews and approves the APR and submits it to the program coordinator for approval and submission to the faculty council.
- iv. The faculty council discusses the APR, approves it, and submits it to the deanship of quality and development.
- v. The Deanship of Quality and Development reviews the APR and ensures its fulfillment for the requirement of program accreditation and submits it to the higher standing committee of academic accreditation and quality assurance.
- vi. The higher standing committee of academic accreditation and quality assurance revises the completion of measurement of the PLOs and sends its recommendations to the deanship of quality and development.
- vii. The Deanship of Quality and Development sends the recommendations to the program coordinator and follows their implementation.
- viii. The program coordinator sends the recommendations to the sub-committee, responsible for preparing the APR.
- ix. The Quality Committee follows the execution of the improvement plans and the percentage of achievement of the improvement plans is reported in the APR of the next year.

The quality assurance activities at the program level are presented in table (2) with the specified by time.

Table 2: The Quality assurance Procedures at the course and Program level

Activity Name	End of Course	Annually	Responsibility
Course Evaluation Survey	√		Course Instructor through the Meyer Plus Platform
Course Report finalization	√		Course Coordinator
Course Binder Submission	√		Course Coordinator
Student Experience Survey		√	Quality Committee
Program Evaluation Survey		√	Quality Committee
Staff Satisfaction Survey		√	Quality Committee
Employer Evaluation Survey		√	Quality Committee
Alumni Evaluation Survey		√	Quality Committee
Academic Advising Survey		√	Academic Advising Committee
Operational Plan report		√	Quality Committee
Program KPI Report Preparation and Analysis		√	Quality Committee
Annual Program Report Preparation		√	Quality Committee
Annual Program Report Revision		√	Deanship of Development and Quality
APR and Course Reports approval		√	Faculty Council
Actions Plan Preparation and Distribution		√	Quality Committee
Actions Plan Execution Assessment		√	Program Chair

Although most of the items in the previous table indicate that they fall under the responsibility of the Quality Committee, the committee members themselves will not perform the duties.

Instead, the Quality Committee may request an individual faculty member or another committee to perform the respective job and forward the findings to the Quality Committee. The Quality Committee may hold another internal meeting to approve the data and produce the respective report in the appropriate place.

Table 3: The Quality assurance Procedures at the course and Program level

Activity Name	Monthly	Start of the Course	End of the Course	Annually	Every 5 years
Committee meetings	√				
Departmental council meetings	√				
Faculty council Meeting	√				
Course Binder			√		
Course Evaluation Surveys			√		
Course Reports			√		
Needs Assessment and Checking the Resources				√	
Teaching Plan and Schedules				√	
Surveys (Students' Evaluation Survey, Program Evaluation Survey, Alumni Evaluation Survey, Employer Evaluation Survey, Learning Resource Satisfaction Survey)				√	
Program KPI Report and Analysis				√	
Operational plan Report and Analysis				√	

Stakeholders' surveys Report and Analysis				√	
PLOs measurement, analysis, report finalization with the improvement plan				√	
APR & the Improvement Plan				√	
Course reports and APR Revision/Recommendat ions by Deanship of Development and Quality				√	
Improvement Plan Distribution, Execution and Assessment				√	
Advisory committee meetings and recommendations				√	
Independent Program Review (SSRP)					√
Review of Program & course Specifications and LOs and study plan				√ (Internal review) (Minor change)	√ (Extern al Review) Major Chang e
Program mission, goals, and operational plan					√
Program SWOT Analysis Preparation and Reporting					√

Self-Evaluation Scale				√	√
Self-Study Report of the program (SSRP)					√

Table 4: Program Evaluation Matrix

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time
Effectiveness of teaching and assessment methods	Students, Alumni, Faculty, Employers	Exam results and Course reports PLOs achievement APR Program leaders-students meeting PES AES EES SES National exam results	End of each course Annually
Learning resources	Students, Alumni, Faculty, Employers	Course reports Course Evaluation Survey (CES) APR LRSS PES AES EES SES	End of each course Annually
Overall quality of the program	Students, Graduates, Alumni, Faculty, Employers,	Course Reports APR Operational plan report	

	Advisory committee.	KPIs reports Program goals report PLOs report Stakeholders survey report Advisory committee meetings	Annually
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Table 5: Role of BSc in EE program Staff and Students in Planning, Quality assurance and Decision making

	<i>Teaching staff</i>	<i>Employee</i>	<i>Students</i>
Planning	Involved in formulation of program mission, goals. Involved in preparation program specification, Participation in preparation of course specifications Head and member in department council, and committees Participate in measuring PLOs - CLOs	Members of the program Committees Share in preparation of SWOT analysis (Strategic and operational plan) Providing feedback and proposals for improvement	Students are members in the following committee: Students' activities clubs.

<i>Quality Assurance</i>	Feedback through meetings and surveys Members in Accreditation committees Members in the Quality Committee	Satisfaction survey.	Students share in evaluation of quality of courses and program and share in developing of improvement plans through various surveys: AES SES CES PES
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<p>Decision Making</p>	<p>Faculty council members (faculty leaders) Committees Academic department councils Course Coordinators and Course Instructors Participate in designing improvement plans (course report, APR, operational plan report, KPI report) Participate in reviewing and improvement of the study plan</p>	<p>Members in the program Committees Share in preparation of SWOT analysis Providing suggestions for improvement Provide requests for improvement of facilities and purchasing equipment</p>	<p>Students share in decision making through:</p> <ul style="list-style-type: none"> • Initiation of different students' clubs • Designing students' activities • The priorities for improvement through the surveys.
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9. Five-Year periodic Evaluation of the Quality of the B.Sc. in Electrical Engineering Program

The program follows a set of procedures to manage its quality assurance according to specific schedule. It starts from planning to implementation and passing through performance measurement and evaluation of the achieved results that lead to review and improvement to start a new cycle.

The program follows a set of practical steps to conduct the annual cycle to ensure its quality according to a specific time frame and specific procedures. It proceeds from developing plans that enable the achievement of its mission and goals, passing through the implementation processes in accordance with the roles, responsibilities, tasks and powers, and finally evaluating the performance through the use of the various data received from the various activities, which lead to the review and development of annual improvement plans in order to achieve the mission and objectives of the program.

The program conducts a comprehensive periodic evaluation every 5 years after completion of the program cycle and prepares reports about the overall level of quality, with the identification of points of strength and weakness; plans for improvement; and follows up its implementation. It is a systematic evaluation for all aspects of the B.Sc. in Electrical Engineering program, including study plan, and program learning outcomes, policies, academic services, and resources for improvement based on changes in the Electrical Engineering sectors and stakeholder perceptions.

The program also performs quality control audit every year based on results of stakeholders' surveys, operational plan reports, APR, advisory committee recommendations and in accordance with updates in the National Qualifications Framework, the requirements of the NCAAA framework with abidance by the matrix of authority approved by UT. In parallel with the updating of the university strategic plan every 5 years, the program revises its mission and goals to ensure consistency with the faculty and university mission and goals and updates its operational plan.

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To maintain the quality of the B.SC. in Electrical Engineering program for long term, a self- assessment should be carried out to the program every five years to ensure that it remains in accordance with the re/accreditation requirements of the organization. The self-evaluation process involves a retraction from the continuous process and a revision of all areas of the program based on present developments during a specific period, and on the potential changes that have occurred in the environment in which the students are being prepared to work.

10. Key Performance Indicators (KPIs) and Benchmark

KPIs are specific forms of evidence used by the Quality Committee to provide evidence and measure the of quality performance. The KPIs are one of the most important tools for assessing the quality of academic programs according to the criteria and rules of the NCAAA and are among the most prominent practices that contribute to decision-making and follow-up processes and continuous development and improvement.

The NCAAA has identified 17 KPIs at the program level all of which are in line with the evolving program accreditation standards. These indicators are the minimum to be periodically measured, and the academic program can use additional performance indicators if it believes they are necessary to ensure the quality of the program. One program KPI is added to the 17 KPIs of the NCAAA as it is believed to add valid information for assessing and evaluating the performance of the B.SC. in Electrical Engineering program.

1. Levels of Each KPI

It is expected that the program measures the KPIs with benchmarking using the appropriate tools, such as (Surveys, Statistical data, etc.) according to the nature and objective of each indicator, as well as determining the following levels for each indicator:

i. Actual performance

Refers to the finding outcome determined when the KPI is measured or calculated. It represents the actual reality of the present situation. A finding benchmark is also an internal benchmark.

ii. Targeted performance level:

Refers to the anticipated performance level or desired outcome (goal or aim) for a KPI. A target benchmark is also an internal benchmark.

iii. Internal reference (Internal benchmark):

Refer to benchmarks that are based on information from inside the program or institution.

Internal benchmarks include target or finding benchmark data results from previous years.

iv. External reference (External benchmark)

Refer to benchmarks from similar programs that are outside the institution, it refers to other institutions (national or international).

v. New target performance level

Refers to the establishment of a new or desired performance level or goal for the KPI that is based on the outcome of the KPI analysis.

2. Selection of KPI:

For each KPI, an acceptable target level to be achieved is set based on the program strategic goals, the comparative data of the internal and external benchmarking, with the intention to gain a performance growth with a minimum rate of 5% annually.

For each KPI the following values are measured:

Target KPI: which is determined according to the KPIs measurements of the internal and external benchmarking. Hence, it is the new target KPI of the former academic year.

Actual KPI: which is the actual level of the current year's performance.

New target KPI: which is determined in consideration of the actual benchmark.

KPI Analysis:

Refers to a comparison and contrast of the benchmarks to determine strengths and recommendations for improvement.

- For the achieved target KPI level, a holding of the new targeted level is kept for an additional year to establish and maintain the good practice before setting an increment of the new target KPI.
- A 5% growth rate is considered an acceptable improvement of the practice when setting a

new target KPI level.

- If the target is not achieved the previous target will be held as a new target for the year after, with investigating the reasons and delineating a plan for improvement to reach the targeted performance.

3. Sources of data:

- The EE program operational plan reports.
- Reports on stakeholder surveys
- Program evaluation survey (PES).
- Courses' evaluation surveys (CES).
- Student experience survey (SES).
- Academic staff Satisfaction survey (SSS-AC)
- Administrative staff satisfaction survey (SSS-AD).
- Employer Evaluation survey (EES).
- Stakeholder satisfaction with learning resources report.
- Official students' records obtained for the university secured internal system (e- register).
- Students marking of the National progress test
- EE program staff university records from human resources.
- Scopus and ISI databases.

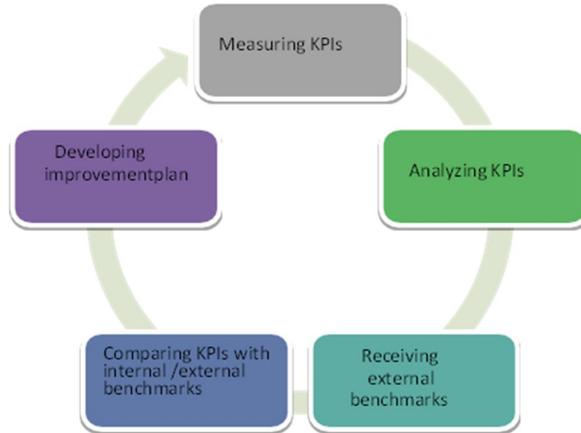
4. Data analysis methodology:

All data analysis is performed using Microsoft Excel for Microsoft 365. KPIs are presented as one of the following:

- Weighted mean and scored on a scale of 5 considering (3/5) as a cut-off level of satisfaction. However, in few cases this consideration of 3 out of 5 score is compromised.
- A proportion
- A percentage of performance.

The outcome of all KPIs values is presented as a percentage to calculate the final performance of the EE program indicators for the academic year of interest. Rates of growth (increment) or

decline (decrement) are calculated in the comparative and trending analysis of the current performance with the internal and external benchmarking



KPIs annual assessment cycle

Code	Indicator	Goal	Time for measurement	Data Measurement Provider	Measurement Responsibility	Measurement Tools
KPI-P-01	Percentage of achieved indicators of the program operational plan objectives	Measuring the quality of program performance	Annually at the end of academic year	All committees	Head of Program and Study Plans Committee	Operational plan template Completion rate report template
KPI-P-02	Students' Evaluation of quality of learning experience in the program	Measuring the educational quality of the program	Annually at the end of the academic year	Quality Committee	Head of the Quality Committee	Program Evaluation Survey
KPI-P-03	Students' evaluation of the quality of the courses	Measuring the educational quality of the program	Annually at the end of academic year	Quality Committee	Head of the Quality Committee	Course Evaluation Survey
KPI-P-04	Completion rate	Measuring the educational quality of the program	Annually at the end of academic year	Academic Affairs Coordinator	Head of the Quality Committee	Statistical data and analysis
KPI-P-05	First-year students retention rate	Measuring the educational quality of the program	Annually at the end of academic year	Academic Affairs Coordinator	Head of the Quality Committee	Statistical data and analysis
KPI-P06	Students' performance in the professional and/or national examination	Measuring the educational quality of the program	Annually at the end of academic year	Program Chair	Program Chair	Statistical data and analysis of progress test results
KPI-P-07	Graduates' employability and enrolment in postgraduate programs	Measuring the quality of graduates <Characteristics, and the extent of employers> satisfaction, and the labor market's need	Annually at the end of academic year	Program Chair	Program Chair	Statistical data and analysis

		for them				
KPI-P-08	Average number of students in the class	Measuring the quality of educational facilities	Annually each academic year	Academic Affairs Coordinator	Head of the Quality Committee	Statistical data and analysis
KPI-P-09	Employers evaluation of the program graduate proficiency	Measuring the quality of graduates <Characteristic s and employers>	Annually each academic year	Quality Committee	Head of the Quality Committee	Employer Evaluation Survey
KPI-P-10	Students' satisfaction with the offered services	Measuring the quality of support for students	Annually each academic year	Quality Committee	Head of the Quality Committee	Program Evaluation Survey
KPI-P-11	Ratio of students to teaching staff	Measuring the quality of education elements	Annually at the end of academic year	Academic Affairs Coordinator	Head of the Quality Committee	Statistical data and analysis
KPI-P-12	Percentage of teaching staff distribution	Measuring the quality of education elements	Annually at the end of academic year	Academic Affairs Coordinator	Head of the Quality Committee	Statistical data and analysis
KPI-P-13	Proportion of teaching staff leaving the program	Measuring faculty's satisfaction with the educational environment	Annually at the end of academic year	Program Chair	Program Chair	Statistical data and analysis
KPI-P-14	Percentage of publications of faculty members	Measuring the quality of the axis of scientific research	Annually at the end of academic year	Scientific Committee	Head of Scientific Committee	Statistical data and analysis
KPI-P-15	Rate of published research per faculty member	Measuring the quality of the axis of scientific research	Annually at the end of academic year	Scientific Committee	Head of Scientific Committee	Statistical data and analysis
KPI-P-16	Citations rate in refereed journals per faculty member	Measuring the quality of the axis of scientific research	Annually at the end of academic year	Scientific Committee	Head of Scientific Committee	Statistical data and analysis
KPI-P-17	Satisfaction of beneficiaries	Measuring the quality of learning	Annually at the end of academic year	Quality Committee	Head of the Quality Committee	Staff Satisfaction Survey (SSS)

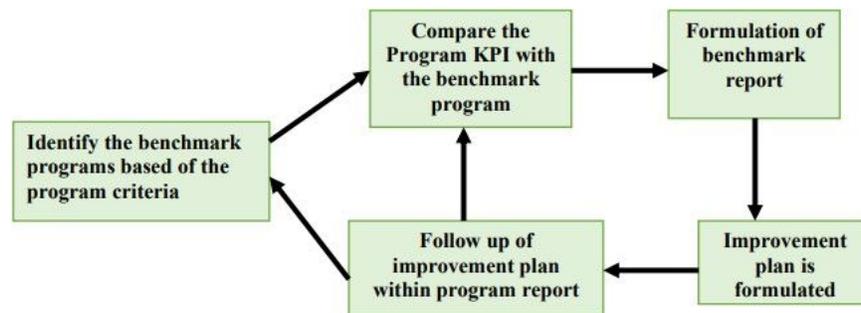
	with the learning resources	resources				Program Evaluation Survey (PES) Student Experience Survey (SES) Course Evaluation Survey (CES)
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The target of the KPI is determined based on: The future plan for faculty strategic plan, internal and external benchmarking.

Graduation in the target value is applied whenever the current values are far from the strategic targets

11. Benchmarking and Improvement Cycle

It is a systemic and continuous process for measuring the program performance by comparing it to another program within or outside this university to identify the causes of the gap and work to address them and reach the best performance. Benchmarking is a vital process for maintaining the high quality of performance of any program and ensure continuous quality improvement (Fig.4). It allows for comparing the performance of various aspects of the program with respect to the good practices recommended by the NCAAA.



KPI Improvement Cycle

The Importance of Benchmarking:

1. Rationalization of expenditure.
2. Providing continuous learning opportunities.
3. Provide an opportunity to move internally and externally towards better models.

4. Providing cooperation opportunities between local organizations.
5. Adopting an organizational culture aimed at solving problems.
6. Assisting the foundation in precisely defining the gap between its performance and that of the leading institutions in its field of work.
7. It helps to provide the appropriate climate and enhances the desire for leadership of the institution and its employees to adopt a policy of change towards all that is better and new.
8. Helping define critical processes, give them the necessary attention and priority in implementation, and actively contribute to developing individual and group creativity.
9. It actively contributes to increasing the chances of achieving additional benefits for the program.
10. The external focus of the benchmarking method creates external competitive measures that necessarily increase the efficiency and effectiveness of internal performance quality measures and makes them more competitive.

12. Stakeholders Surveys

The relationship between stakeholder's satisfaction and program sustainable growth and success is investigated focusing on the importance of a firm's relationships with critical stakeholders that may lead to better performance, as program while integrating business and societal considerations create value for their stakeholders. However, it is of most importance that top management actively leads this approach and that the governance bodies of the organizations support and check that this really happens. There are different types of surveys for all program stakeholders.

Main Principles

There are several general principles that should be followed if student surveys are to be as useful as possible.

1. It must be made clear to students that all survey responses are anonymous.
2. Surveys should include common questions to enable them to be used for comparisons within departments and between courses.
3. Some open-ended questions should be included to permit respondents to comment on additional matters of concern.
4. In addition to several individual items relating to matters considered important, surveys can include one or two summary items that can be used as general quality indicators.

5. To be used for benchmarking quality between programs the surveys should be distributed in similar ways and at similar times and comparisons made between comparable institutions.
6. Questions should be consistent over time (normally at least three years) so that valid trend data can be obtained.
7. The validity of responses depends on having a reasonable response rate. Normally at least 50% is essential. To encourage participation:
 - a) Surveys should not be overused.
 - b) Use should be made of the responses, and summary reports and indications of action taken in response made available.
 - c) The surveys should not be too long (a maximum of 20 to 25 items plus a small number of open-ended items is usual).

13. Recommended Surveys

Students and staff are the principal customers of the education system and surveys of their opinions are one of the most important sources of evidence about quality in higher education. Other stakeholders should be considered, they can provide very good insight about the outcomes of the program. They can provide very useful suggestions for improvement that should be considered in the quality cycle for improvement as applied to individual courses, programs, and institutional planning.

Type of surveys used:

1. Course Evaluation Survey (CES):

- a) A course evaluation survey is distributed at the end of each course. It is recommended that this survey be distributed in each course once each year.
- b) The survey does not directly assess the quality of teaching by individual instructors. However, the evaluation of the course is seen as a reasonable measure of the quality of teaching in a way that minimizes personal issues that could inhibit responses from students.
- c) The survey asks questions about several aspects of each course. The final question is intended to provide a summary question that might be used as a general quality indicator.

2. Student Experience Survey (SES):

- a) This is intended as a general survey that is distributed to all students mid-way through

their program (in between phase 2 and phase 3) of B.SC. in EE program.

a) The survey deals with the student's life at the institution including both major elements of the program in which they are enrolled and several general items relating to services and facilities. As for the other surveys the final question is a summary item that might be used as a general quality indicator.

3. Program Evaluation Survey (PES):

b) This survey is conducted annually. It is intended for use at the time students have finished their program and are about to graduate. It is recommended to be distributed shortly before final year classes are finished so their opinion of the total program at that stage can be assessed.

c) The questions include several items about the program itself together with some items like those in the SES that deal with their life as a student at the institution. As for the other surveys the final question is a summary item that might be used as a general quality indicator.

4. Alumni Evaluation Survey (AES):

a) A survey of alumni is conducted annually. The target alumni are those graduates from the last year earlier and 3 years earlier.

b) This instrument captures quantitative rankings about their experience in the program and PLOs, their achievement in FE exams, enrolment in post-graduate program and employability.

5. Employers Evaluation Survey (EES):

This survey is conducted on an annual basis aiming to assess the level of satisfaction among employers about the outcomes of the program and also used to assess the PLOs.

6. Learning Resources Satisfaction Survey (LRSS):

This annual survey is divided into two parts. The first part aims to gather information on the adequacy of learning resources, while the second part is designed to collect data on the diversity of learning resources. The survey is focused on the key stakeholders of the program, namely, Faculty, Alumni, Employer, Advisory Board, and Students.

Response Scale

It is recommended that each item in the surveys be responded to on a five-point scale. The recommended scale is:

1. Strongly agree (5)
2. Agree (4)

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3. Neutral (or undecided) (3)
4. Disagree (2)
5. Strongly disagree (1)

Table (8): Stakeholders' Survey

Stakeholders' Survey Plan

Survey	Area of Evaluation	Target Group	Distribution Responsibility	Distribution Timing	The Uses of the Survey	The Target of the Response
CES (Course Evaluation Survey)	Course quality	Students	Course coordinator	End of the course	-KPI-P-03 Average student overall rating of course quality on five-point scales -Course report	Applying to all program courses With a response rate of not less than 50% of the sample
SES (Students' Evaluation Survey)	The student's academic life in the educational institution, including the basic components of the program.	Students who have passed half of the program's duration	Quality Committee	Through some selected courses, midway through the program.	KPI-P-10 Student satisfaction with services provided KPI-P-17 Beneficiaries' satisfaction with learning Resources	A response rate of not less than 50% of the sample size of 25 to 50 students.
PES (Program Evaluation Survey)	Final year students' satisfaction with program, services, facilities, and program management	Final year students of the program	Quality Committee	Through some selected courses, which are offered at the tail end of the program.	KPI-P-02 Students' evaluation of the quality of learning experiences in the program KPI-P-10 Student satisfaction with services provided KPI-P-17 Beneficiaries' Satisfaction with Learning Resources	A response rate of not less than 50% of the sample size of 50 to 100 students.

AES (Alumni Evaluation Survey)	Alumni satisfaction with the program	Alumni	Quality Committee	At least 6 months after their graduation	KPI-P-02 Students' evaluation of the quality of learning experiences in the program KPI-P-10 Student satisfaction with services provided	With a response rate of not less than 50% of the sample size of 25.
EES (Employers' Satisfaction Survey)	Employers' satisfaction with program outcomes	Employers	Quality Committee	It is submitted to the employers one year after the student's graduation.	KPI-P-09 Employers' assessment of the competency of program graduates	With a response rate of not less than 50% of the sample size of 15 to 25
LRSS (Learning Resources Satisfaction Survey)	Satisfaction of the beneficiaries with the learning resources	Students, Faculty, Alumni, Advisory Board	Quality Committee	This survey is sent to the stakeholders anytime during an academic year	KPI-P-17 Stakeholders' assessment of the level of satisfaction on the learning resources and the diversity of the learning resources	With a response rate of not less than 50% of the sample size of 25.