جامعة الملك خالد
KING KHALID UNIVERSITY

Department of Electrical Engineering

Quality Assurance Manual for Electrical Engineering

2024

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List of Abbreviations

KKU	King Khalid University
COE	College of Engineering
EE Dept.	Electrical Engineering Department
QMS	Quality Management System
SSRp	Self-Study Report
HODs	Head of the Departments
APR	Annual Program Report
NQF	National Qualification Framework
NQF-KSA	The National Qualification Framework for the Kingdom of Saudi Arabia
KPI	Key performance Indicator
QA	Quality assistance
PLOs	Program Learning Outcomes
CLOs	Course learning Outcomes
GA	Graduate attributes
SES	Self-Evaluation Scales
IP	Intellectual property
HRD	Humen resource department

MoM	Minutes of Meeting
VD-ED	The Vice Dean for Educational Affairs and Development
VD-RPS	Vice Dean of Research and Postgraduate Studies
HRD	Human Resource Development
NCAAA	National Commission for Academic Accreditation and Assessment

Overview

This manual provides a detailed guide to the quality management system adopted by the Electrical Engineering Department at King Khalid University, aligning with national educational strategies and international accreditation standards. Chapter 1: Electrical Engineering Program, this chapter introduces the Electrical Engineering program, emphasizing its alignment with Saudi Vision 2030. It discusses the educational strategies implemented to enhance learning, such as Constructivist Learning Theory and Experiential Learning, aiming to improve student outcomes and align educational practices with modern engineering demands. Chapter 2: Quality Management System (QMS) at Program the Quality Management System (QMS) is detailed in this chapter, highlighting its role in maintaining educational excellence and meeting international standards. The focus is on continuous quality assurance through periodic reviews, monitoring, and curriculum adaptation to ensure relevance and quality. Chapter 3: Committees Members and Tasks, this section lists the various academic and administrative committees within the department, describing their roles in overseeing and maintaining the quality and relevance of the engineering programs offered. Chapter 4: The National Qualifications Framework for Saudi Arabia (NQF-KSA), It outlines the framework's role in standardizing qualifications to meet job market demands and support societal development, ensuring that the programs adhere to national standards. Chapter 5: Academic Program Development and Review, the processes involved in developing and periodically reviewing academic programs are discussed. This includes mechanisms for incorporating stakeholder feedback, monitoring program outcomes, and implementing improvements based on systematic reviews and the latest industry trends. Overall, the manual serves as a comprehensive guide, ensuring that the department’s offerings remain at the forefront of educational development and are responsive to technological and societal changes.

Chapter 1 Electrical Engineering Program

1.1 College of Engineering (COE)

The College of Engineering at King Khalid University was established to address the escalating need for highly skilled engineers in Saudi Arabia, aimed at contributing to the nation's developmental goals. Its founding aligns with the country's broader educational strategies, particularly the objectives laid out in Saudi Vision 2030, which emphasize economic diversification and infrastructure development. Initially, the college offered a few select programs in key engineering disciplines. Over the years, it has expanded to include various specialized departments such as Civil Engineering, Mechanical Engineering, Electrical Engineering, and Chemical Engineering, among others. This growth has been supported by significant investments in infrastructure, including state-of-the-art laboratories and modern facilities that foster an environment conducive to learning and research.

The programs at the college are designed to meet international accreditation standards, ensuring that the curriculum is continuously updated and aligned with the latest industry requirements and technological advancements. This focus on quality and relevance in education enables the college to produce graduates who are well-prepared to enter the workforce and contribute effectively to both local and global engineering challenges.

The college is also actively engaged in community and industry partnerships, facilitating a symbiotic relationship where academic knowledge meets practical application. These collaborations not only enhance the educational experience but also contribute to the region's socio-economic development through focused research and innovation. As the College of Engineering at King Khalid University continues to evolve, it remains committed to excellence in engineering education, preparing future generations of engineers to lead and innovate in an ever-changing global landscape

1.2 History and Background of Electrical Engineering

The Electrical Engineering Department at King Khalid University is a vital part of the College of Engineering, which consists of seven different departments. This department uniquely offers a singular major track program the Bachelor in Electrical Engineering. Established with the approval of the Ministry of Education under the authorization number MOHE / 9683 on May

8, 2005, corresponding to 05/08/1426 in the Hijri calendar, the program is designed to run over five years, segmented into ten semesters.

The inception of this program was driven by multiple strategic objectives, each aiming to enrich the industrial and educational landscape of the region. One of the primary goals is to serve the industrial community by providing engineering practices in scientific principles, ensuring that theoretical knowledge meets practical application. This approach not only enhances the technical competencies within the local industries but also strengthens the connection between the university's academic pursuits and industrial needs. Another significant aim of the program is to disseminate electrical engineering knowledge among the local population. By doing so, the program helps in fostering a well-informed community that understands and appreciates the advancements and challenges in the field of electrical engineering.

The program also focuses on research, preparing students to contribute to and expand the body of knowledge in electrical engineering. This preparation is crucial for developing innovative solutions and advancing the state of technology in various subfields, including electrical power and machines, communications, computers, and control systems. Qualifying students as proficient electrical engineers equipped to tackle challenges in these specialized areas remains a cornerstone of the program. By providing comprehensive education and practical experience, the program ensures that graduates are well-prepared to enter the workforce as competent professionals who can contribute positively to the growth and development of the engineering sector.

As the program has evolved, it continues to adapt and update its curriculum to keep pace with technological advancements and changing industry needs, ensuring that it remains relevant and effective in fulfilling its mission of education and service to the community. The establishment and ongoing success of the Electrical Engineering program at King Khalid University underscore the university's commitment to high-quality education and its pivotal role in the socio-economic development of the region.

1.3 Program Organizational Structure

1.3.1. College-Level Leadership

The organizational structure of King Khalid University's College of Engineering, as illustrated in Figure 1 of the organizational chart, encapsulates a well-defined hierarchy aimed at ensuring effective management and governance within the college. This structure is designed to handle

the complexities of administrative and academic functions, ensuring that the college operates smoothly and aligns with its educational mission and goals.

- ***Appointment Process***

The process to fill administrative positions within the college begins with an application phase where interested and eligible administrators submit their applications. The selection of the most suitable candidate from a panel of applicants is typically conducted through a voting process or based on the recommendations of a selection committee. This method ensures that the appointments are merit-based and transparent, contributing to the overall effectiveness and integrity of the college's administration.

- ***College Council***

At the pinnacle of the college's administrative hierarchy is the College Council, which acts as the supreme authority. This council is responsible for making all major decisions and providing directions for the operational and strategic functioning of the college. The College Council likely includes senior faculty members, administrators, and possibly student representatives, ensuring that a wide range of perspectives is considered in decision-making processes.

- ***Role of the Dean***

Central to the college's leadership structure is the Dean, who serves as the full-time chief administrative officer. The Dean is tasked with overseeing all aspects of the college's operations, from academic programs to faculty affairs and student services. Supported by the Dean's Office, which provides administrative and logistic support, the Dean ensures that the

college's policies and decisions are implemented effectively and align with the university's broader goals, and administrative processes are up to standard and continuously improved.

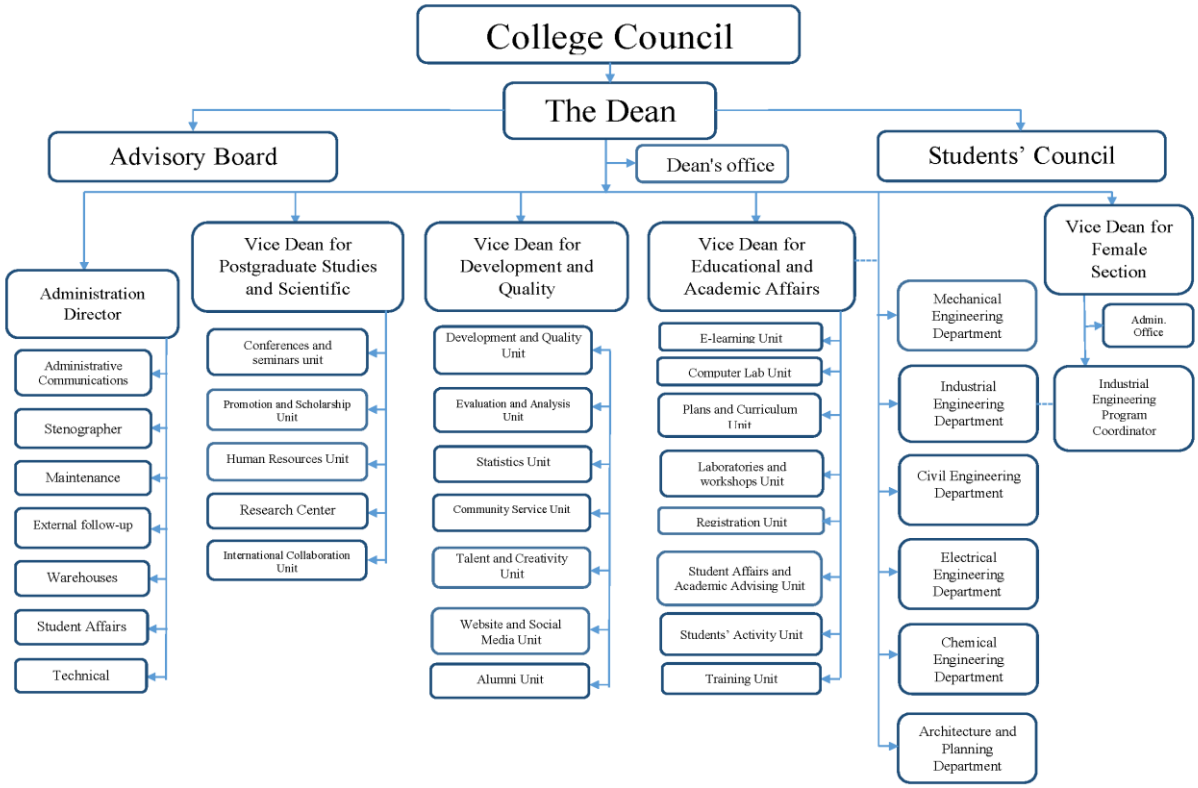

Figure 1 The organizational chart of the College of Engineering.

- ***Students Council and Advisory Board***

The Dean's decisions are also informed by inputs from the Students' Council and the Advisory Board. The Students' Council represents the voice of the student body, providing insights into student needs and concerns, thereby helping to shape student-related policies and activities. The Advisory Board, consisting of external and internal stakeholders, offers strategic advice, ensuring that the college remains aligned with industry standards and academic advancements.

- ***Role of Vice Deans***

Supporting the Dean are Vice Deans, each typically responsible for specific areas such as academic affairs, research, student affairs, or resource management. These Vice Deans play a crucial role in managing their respective units, committees, and centers. The specialized structure under each Vice Dean allows for focused attention on different aspects of college

operations, such as enhancing academic quality, promoting research, improving student life, and managing financial and physical resources.

- ***Operational Units, Committees, and Centers***

The operational units, committees, and centers are essential components of the college's structure. These entities are directly controlled by the Vice Deans and are pivotal in executing the college's strategic initiatives and day-to-day operations. Committees might include those for curriculum development, quality assurance, research ethics, and more, ensuring that all academic

1.3.2. Program-Level Leadership

The organizational structure at the program level within the College of Engineering at King Khalid University is specifically designed to align with the college's overarching strategic goals while addressing the unique operational needs of each department. This structure is centrally coordinated by the Head of the Department, who is supported by a comprehensive array of committees and a departmental council.

- ***Appointment and Role of the Head of the Department***

The Head of the Department is a pivotal leadership position, appointed by the Dean of the College. This individual bears a significant responsibility for steering the department toward achieving the college's educational and strategic objectives. The head's responsibilities are broad and encompass overseeing curriculum development, faculty and staff hiring, course allotment, workload distribution, faculty induction, student orientation, and the overall management and strategic vision of the department.

- ***Governance and Advisory Structure***

The Departmental Council, chaired by the Head of the Department, plays a critical role in the governance of the department. This council is involved in making key academic and administrative decisions that affect daily operations and long-term planning. The head also chairs the Advisory Board for Undergraduate and Postgraduate Studies, which ensures that the programs offered are both rigorous and relevant, meeting the evolving standards of academia and industry.

- ***Mentorship and Representation***

The Head of the Department acts as a mentor to faculty members and students, fostering an environment that encourages professional development and active engagement in university life. This role extends to organizing and supporting various activities, including training sessions and workshops that are often driven by student clubs. Additionally, the head represents the department in meetings with higher university administration and the College Council, ensuring that there is alignment between departmental initiatives and college-wide strategies.

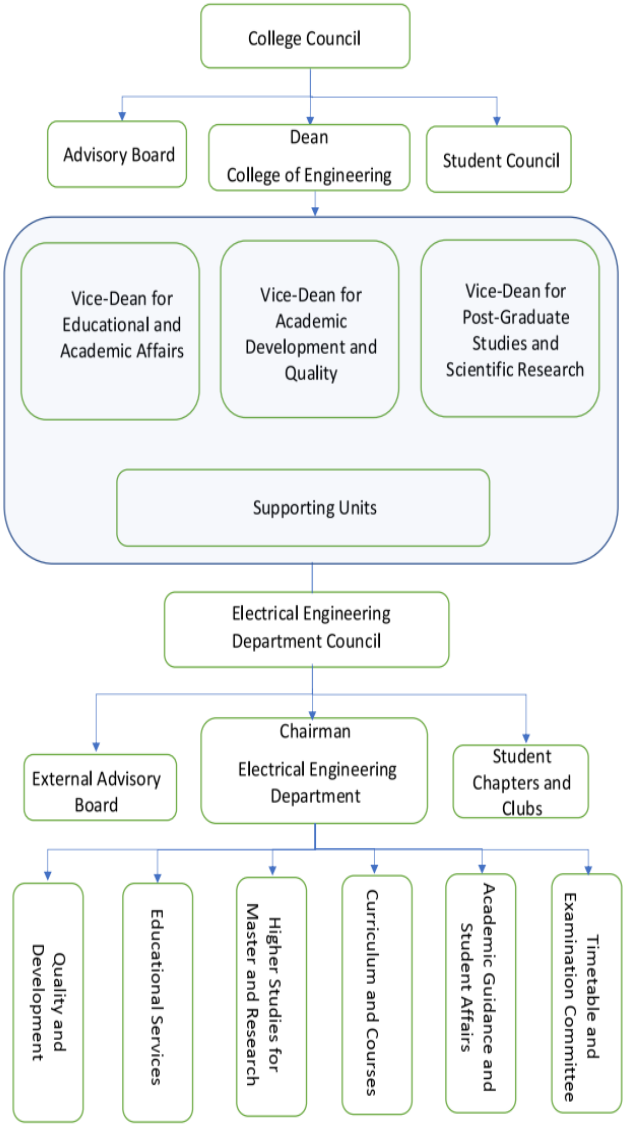

Figure 2 The program-level organizational structure.

- ***Continuous Improvement and Feedback***

A key responsibility of the Head of the Department is to monitor and continually improve the department's offerings. This is achieved through periodic meetings with faculty members and the Dean, alongside the collection of regular feedback from stakeholders such as students,

alumni, and industry partners. Such feedback is crucial for adapting to changes and addressing any issues promptly.

- ***Supportive Committees***

To effectively manage the diverse needs of the department, several specialized committees operate under the leadership of the head:

a. ***Quality Assurance Committee***: The Quality Assurance Committee plays a pivotal role in maintaining and enhancing the standards of academic and operational processes. This committee ensures that all departmental activities adhere to internal quality benchmarks and external accreditation requirements. Their work is critical for continuous improvement, involving regular reviews of teaching methods, facilities, and administrative processes to guarantee that students receive high-quality education.
b. ***Curriculum Committee:*** The Curriculum Committee is tasked with the ongoing review and revision of course offerings to ensure that the curriculum remains relevant and rigorous. This committee assesses the educational content against current academic standards and industry demands, making necessary adjustments to keep courses up-to-date. By integrating the latest advancements and trends into the curriculum, the committee helps prepare students to meet the challenges of the modern workforce.
c. ***Research Committee:*** The Research Committee fosters a vibrant research environment within the department by managing and promoting scholarly activities. This committee supports faculty and students in initiating and conducting innovative research projects, securing funding, and disseminating findings through publications and conferences. Their work not only enhances the department's reputation but also contributes to the advancement of knowledge in the field of engineering.
d. ***Postgraduate Studies Committee:*** Specializing in the oversight of postgraduate programs, the Postgraduate Studies Committee addresses the specific needs and administration of master's and doctoral studies. This committee ensures that postgraduate offerings are designed to advance students' knowledge and research skills, providing them with the expertise needed to excel in their careers or further academic pursuits.
e. ***Educational Services Committee:*** The Educational Services Committee oversees the logistical aspects of course delivery, which includes managing classroom resources, integrating educational technologies, and ensuring that the physical and digital learning

environments are conducive to effective teaching and learning. This committee plays a crucial role in the smooth operation of daily educational activities.

f. ***Graduation Projects Committee:*** Overseeing the completion, submission, and assessment of final-year projects, the Graduation Projects Committee ensures that students' capstone experiences reflect the cumulative knowledge and skills acquired throughout their studies. This committee sets the standards for these projects and evaluates them to ensure they meet academic and professional criteria.

g. ***Academic Advising Committee:*** The Academic Advising Committee provides essential guidance to students regarding their academic pathways and career planning. This committee helps students make informed decisions about their course selections, navigate academic challenges, and align their educational pursuits with their long-term career goals.

h. ***Timetable and Examinations Committee:*** Responsible for the planning and execution of academic schedules and the administration of examinations, the Scheduling and Examinations Committee ensures that the timetable is optimized to facilitate effective learning and teaching. This committee coordinates between various departments and services to manage the complexities of scheduling courses, exams, and faculty assignments efficiently.

1.4 Mission and Goals/Objectives of the College and Program

The mission and goals of a college and its programs are fundamental to guiding its strategic direction and educational offerings. These are crafted to reflect the overarching vision of the institution, aligned with academic excellence, research, community service, and professional development. Here, we will outline a typical structure for the mission and goals/objectives of the College of Engineering and its programs, such as those that might be found at King Khalid University.

- ***College Vision***

To be a pioneer in engineering education, innovative research, and sustainable development of the community.

- ***College Mission***

To achieve academic excellence by providing adequate teaching-learning resources, motivating scientific research, and bring forth qualified engineers to serve the community.

- ***College Objectives***

1 Academic excellence through development of curriculum at par with national and international standards.
2 Collaboration with colleges/universities for knowledge sharing and benchmarking.
3 Support innovative research to contribute to achieving the vision of King Khalid University.
4 Interaction with industries to produce trained and skilled graduates, solve real-life problems and obtain feedback for continuous improvement.
5 Contribute to the sustainable development of the community by continuing education, training and consultancy services.
6 Improvement in financial resources.

- ***Program vision***

Achieve leadership in the field of Electrical Engineering with a high-quality education, instill professional skills and contribute through scientific research for the sustainable development of the community.

- ***Program Mission***

To endow high quality education and prepare electrical engineers who are competent to use modern technology effectively for carrying out innovative research and engage in community services.

- ***Program Objectives***

The PEOs of the Electrical Engineering Undergraduate Program are to be professionally accomplished so that our graduates will be able to:

1 Establish themselves in productive and successful careers in electrical engineering or related area and function effectively in interdisciplinary teams involving design and/or support of engineering activities.
2 Pursue advanced studies and scientific research and engage in lifelong learning in electrical engineering and allied fields.
3 Practice and inspire high technical standards and communicate their work and accomplishments to colleagues and the public.
4 Contribute to community service through their technical expertise and skills while maintaining professional ethical conduct.

1.5 Stakeholders

Stakeholders play a critical role in the success and continual improvement of educational institutions. In the context of King Khalid University's College of Engineering and its Electrical Engineering program, both internal and external stakeholders contribute valuable insights that influence the program's direction and effectiveness. Here is an elaborate view of how these stakeholders engage with and impact the College of Engineering

1.5.1. Internal Stakeholders

- ***Teaching Staff:*** Faculty members are integral to the academic and operational aspects of the college. They are involved in preparing course reports which document the outcomes and efficacy of each course offered. These reports help in identifying areas of strength and potential improvement. Faculty members also participate in the program's self-evaluation using various scales, providing insights based on their expertise and experience. Their feedback is crucial for adjusting curriculum and teaching methods to better meet educational objectives.
- ***Students:*** As the primary beneficiaries of the educational programs, students offer vital perspectives on their learning experience. They are actively involved in evaluating the quality of education through tools such as the Course Evaluation Survey and Program Experience Survey. These surveys assess various aspects of the educational process, including the effectiveness of teaching methods, the relevance of the curriculum, and the overall educational environment. This feedback is essential for making student-centric improvements.
- ***COE Graduates:*** Alumni are asked to reflect on the quality and impact of their education through the Alumni Survey. This survey gathers data on how well the program prepared them for their careers and further studies. Alumni feedback helps in understanding the long-term value of the program and its alignment with industry and societal needs.

1.5.2. External Stakeholders

- ***Employers of Graduates***: Employers provide critical feedback on the preparedness and performance of graduates in the workforce. Their input helps the college assess whether its curriculum is adequately equipping students with the necessary skills and knowledge to meet the demands of the job market. Employers might highlight areas where graduates excel or where they may need additional training or competencies.

- ***Program Directors of Postgraduate Studies:*** These stakeholders include directors of programs where COE graduates pursue further studies, such as master's. Feedback from these institutional heads can provide insights into the academic preparedness of graduates and their ability to engage in advanced studies and research. This feedback is particularly very important for assessing the foundational knowledge imparted by the undergraduate programs and can lead to enhancements in the depth and breadth of academic.
- ***External Advisory Board:*** It consists of industry experts, alumni, and academicians from other institutions, the External Advisory Board offers strategic insights into the evolution of the engineering field. Their recommendations can influence major decisions about program directions, research focuses, and partnerships. The board plays a pivotal role in aligning the college's objectives with industry trends, technological advancements, and community needs.

1.6 Teaching and Learning Strategies

Teaching and learning strategies are fundamental to enhancing the educational experience and ensuring that graduates are well-prepared for the demands of their professional careers. For the Electrical Engineering program at King Khalid University (KKU), implementing effective strategies based on sound educational theories can significantly boost the development of relevant skills and enhance graduate employability. Here's a detailed look at how these theories can be applied:

1.6.1. Constructivist Learning Theory

Constructivist learning theory posits that learners construct their understanding and knowledge of the world, through experiencing things and reflecting on those experiences. It emphasizes active participation rather than passive reception of information.

- ***Problem-Based Learning (PBL):*** This approach involves presenting students with real-world problems and guiding them to solve these problems through research, experimentation, and collaboration. In electrical engineering, PBL can be used to tackle complex circuit designs or troubleshoot electrical systems, encouraging students to apply theoretical knowledge in practical scenarios.
- ***Group Projects and Collaborative Tasks:*** Encouraging students to work in groups helps them to exchange ideas and solutions, fostering a deeper understanding of

electrical engineering concepts while developing teamwork skills critical in the workplace.

1.6.2. Cognitive Load Theory

This theory deals with the amount of information that the working memory can hold at one time. Cognitive load theory suggests that educational activities should be designed in a way that does not overload the brain's capacity to process new information.

- ***Segmented Learning:*** Breaking down complex topics into smaller, more manageable segments helps students absorb and retain information more effectively. For instance, a detailed topic like microprocessor architecture can be divided into subtopics like instruction sets, microarchitecture, and interfacing.
- ***Use of Visual Aids***: Diagrams, flowcharts, and videos can help illustrate complex electrical concepts like electromagnetic fields or signal processing, reducing cognitive strain and enhancing comprehension.

1.6.3. Social Learning Theory

Social learning theory asserts that people learn from one another through observation, imitation, and modeling. This theory highlights the importance of learning environments where students can observe and interact with peers and instructors.

- ***Peer Learning and Mentorship***: Senior students or more experienced peers can be involved in teaching and guiding newer students through mentoring programs. This can include peer-led workshops or study groups and through academic advising committee members.
- ***Demonstrations and Practical Sessions:*** Instructors can model troubleshooting processes or the use of specific tools and software in a lab setting, providing students with clear examples of professional practice in electrical engineering.

1.6.4. Experiential Learning Theory

This theory emphasizes learning through experience or learning by doing. It is particularly effective in disciplines that involve physical or practical skills.

- ***Hands-on Labs and Simulations***: Students should regularly engage in laboratory exercises where they can work with real circuits, electronic devices, and simulation software. These practical experiences are crucial for understanding the tactile aspects of electrical engineering work.

- ***Internships and Industrial Training:*** Incorporating internships or cooperative education within the curriculum can provide students with invaluable real-world experience, bridging the gap between theoretical studies and professional engineering practice

1.7 Closing Loop for Teaching and Learning Strategies

The process of updating course content and teaching methodologies at the College of Engineering (COE) is an ongoing, structured cycle designed to continuously enhance educational offerings in response to student feedback and assessment data. This process helps ensure that the curricula remain relevant, effective, and aligned with current academic and industry standards. Here is a detailed explanation of each step involved in this cycle:

1.7.1. Collection of Key Indicators

Student Feedback: At the end of each term, students complete a "course evaluation survey" which gathers their perceptions and feedback on the effectiveness of the teaching and learning experience.

Assessment Data Analysis: Performance data from students' assessments are thoroughly analyzed to identify trends, strengths, and areas for improvement in both course content and instructional methods.

1.7.2. Drafting Action Plans

The course coordinator reviews the findings from the student feedback and assessment data to draft a detailed action plan aimed at addressing specific areas of the course that may need improvement. This plan might include adjustments to the course content, teaching methodologies, or both.

1.7.3. Departmental Review

The drafted action plans are presented to the department's Quality and Development Committee. This committee discusses the proposed changes to ensure they are comprehensive and suitable for meeting the identified needs. They consider various factors such as the feasibility of the proposed changes, their potential impact on learning outcomes, and alignment with the overall program objectives.

1.7.4. College-Level Approval

Once the departmental committee approves the action plans, they are forwarded to the College Quality Committee. This higher-level committee reviews the plans to ensure consistency and

alignment across different courses and departments within the college. They provide additional feedback and ultimately approve the action plans for implementation.

1.7.5. Implementation of Updates

With all necessary approvals in place, the course content and teaching methodologies are updated as outlined in the action plans. This step is crucial as it directly impacts the delivery of the course in subsequent terms.

1.7.6. Evaluation of Teaching Strategies

To assess the effectiveness of the updated teaching strategies, data from new iterations of the course evaluation survey are analyzed. This feedback serves as a key performance indicator (KPI-P-06) to measure student satisfaction with the changes. This evaluation helps determine if the updates have successfully addressed the initial concerns and improved the overall educational experience.

1.7.7. Closing the Feedback Loop

The entire process is cyclical. With each term, new data and feedback are used to continuously refine and enhance course offerings. This iterative process ensures that the courses evolve in response to student needs and the dynamic requirements of the engineering field.

Chapter 2 Quality Management System (QMS) at Program

2.1 Introduction to Quality Management Systems

In higher education, the implementation of Quality Management Systems (QMS) is crucial for maintaining high standards across various facets of university operations, including academics, administration, research, and support services. For universities like King Khalid University, adopting recognized standards such as ISO 9001:2008 provides a robust framework that guides the institution toward maintaining excellence and improving its competitiveness. These standards are instrumental in ensuring consistent quality in response to evolving market demands, particularly from the job market, which seeks graduates who are well-prepared and knowledgeable.

The effectiveness of QMS in universities is evidenced through its comprehensive application, spanning educational processes to management practices. This system is not static; it requires continuous refinement and adaptation to align with new educational trends and market needs. It involves regular updates to the curriculum, methodologies, and administrative procedures to ensure they remain relevant and effective. For instance, King Khalid University adheres to the National Commission for Academic Accreditation & Assessment (NCAAA) standards, particularly focusing on Program Management and Quality Assurance to uphold its educational standards.

Within specialized departments like Electrical Engineering, the impact of QMS is profound. Here, QMS ensures that all educational and administrative processes meet stringent standards of quality. The department consistently applies quality assurance procedures to enhance teaching methodologies and learning outcomes. This structured approach includes periodic curriculum reviews, faculty development programs, and the incorporation of industry feedback to ensure that the education provided aligns with current professional and technological standards.

Moreover, the QMS manual serves as a vital document in these processes, outlining the university's organizational structure, quality objectives, and the strategies for achieving these goals. Through such documentation, the university ensures transparency and facilitates a uniform application of its quality standards across all departments. Ultimately, by integrating these quality management principles, King Khalid University, particularly its Electrical Engineering Department, aims to continuously improve its offerings and maintain its standing as a leading institution in the academic and professional landscapes.

2.2 Defining Quality Assurance in Education

Quality Assurance (QA) in education embodies a systematic approach through which educational institutions ensure and maintain certain standards of quality. These standards are crucial for institutions aiming to provide education that meets both the expectations of students and the requirements of external bodies. Quality Assurance encompasses a range of processes and procedures, from internal evaluations to external reviews, all designed to foster continuous improvement and uphold excellence in educational offerings. At its core, Quality Assurance involves setting clear and achievable standards. These standards, often derived from both national benchmarks and international best practices, articulate the expected knowledge, skills, and attitudes that students should acquire by the end of their educational journey. Establishing these standards allows institutions to consistently measure educational outcomes against defined criteria, ensuring that students receive a level of education that prepares them for professional success and personal growth.

Internally, Quality Assurance processes include self-evaluation activities conducted by the institution itself. This self-assessment is integral to maintaining internal standards and involves thorough reviews of curricular content, teaching methodologies, faculty performance, and resource allocation. Through these evaluations, institutions can identify areas of strength and opportunities for improvement, ensuring that their offerings remain relevant and effective in meeting the goals of diverse student populations. Externally, Quality Assurance is enhanced through reviews conducted by independent, often international, experts. This external review process is crucial for adding an objective layer of evaluation, providing institutions with an outsider's perspective on their educational quality. These experts examine the alignment of the institution's goals with its outcomes, offering insights that might be overlooked internally. External reviews often lead to accreditation, a formal recognition that an institution meets the high standards required in higher education, which is pivotal for enhancing an institution's credibility and attractiveness to prospective students. The cycle of Quality Assurance does not end with assessment but extends into continuous improvement. Based on insights gained from internal and external evaluations, educational institutions are expected to develop and implement detailed action plans aimed at addressing any identified weaknesses. This continuous improvement cycle ensures that institutions not only meet existing standards but also adapt to evolving educational landscapes, such as new technological advancements or shifts in the job market.

Engagement with stakeholders forms another critical element of Quality Assurance. This engagement involves soliciting feedback from students, faculty, industry partners, and alumni to ensure that educational programs remain responsive to the needs of all interested parties. Incorporating this feedback helps institutions to refine their educational strategies and ensure that graduates are well-equipped to meet the demands of the workforce. Documentation and transparent reporting are also vital components of an effective Quality Assurance system. Maintaining detailed records of QA processes, standards, and outcomes helps institutions in tracking their progress over time and communicating this progress to stakeholders. Regular reporting ensures accountability, providing stakeholders with confidence in the institution's commitment to quality and its continuous pursuit of excellence.

Table 1 Quality Assurance Governance Structure

Level	**Responsible Unit**	**Role in QA**
Program	Academic Development & Quality Committee	QA planning, monitoring, improvement
Department	Statistics Committee	Data collection, validation, and reporting
College	College Quality Unit	Data verification and benchmarking
University	Deanship of Quality	Policy oversight and accreditation

2.3 Program Quality Assurance Framework and Alignment with Institutional Quality System

The Electrical Engineering Program at King Khalid University implements a structured Program Quality Assurance (QA) Framework that is fully aligned with the University Quality Management System and the College of Engineering quality policies. The framework is designed to ensure academic excellence, compliance with NCAAA standards, and continuous improvement of program outcomes.

The Program QA Framework is aligned with:

- King Khalid University Quality Manual
- College of Engineering Quality System

- National Commission for Academic Accreditation and Assessment (NCAAA) standards
- Saudi Qualifications Framework (NQF)

Quality assurance responsibilities are distributed across multiple levels to ensure effective governance and accountability. At the program level, the Academic Development and Quality Committee oversees quality planning, monitoring, and improvement. At the department level, the Statistics Committee supports systematic data collection, validation, and reporting. At the college and university levels, the College Quality Unit and the Deanship of Quality and Academic Accreditation provide oversight, guidance, and verification, as shown in Figure 3.

The Program QA Framework follows a continuous quality improvement cycle based on the Plan–Do–Check–Act (PDCA) model. This includes planning program objectives and learning outcomes, implementing academic activities, monitoring and evaluating performance through KPIs and assessment data, and implementing improvement actions approved by the relevant academic councils.

All quality-related reports and improvement actions are reviewed and approved by the Department and College Councils to ensure effective closure of the quality loop and alignment with institutional quality requirements.

2.4 Importance of Quality Assurance in Electrical Engineering

Quality Assurance (QA) plays a pivotal role in the field of electrical engineering, a discipline that demands precision, reliability, and safety. Given the complexity and technical rigor of electrical engineering, QA processes are indispensable for ensuring that educational programs, research initiatives, and technical operations align with established standards of excellence. This adherence is not only critical for maintaining academic integrity and enhancing educational outcomes but is also essential for ensuring compliance with both national and international accreditation standards.

2.4.1. Educational Excellence in Electrical Engineering

In educational settings, QA is integral to developing and maintaining high-quality electrical engineering programs that produce graduates who are well-prepared to enter a competitive and ever-evolving job market. Quality assurance processes ensure that curricula are up-to-date with the latest technological advancements and industry standards. By regularly reviewing and revising course content and teaching methodologies, institutions can provide their students with the knowledge and skills necessary to succeed. This continuous improvement process is driven

by feedback from academic peers, industry experts, and graduates, ensuring that the programs remain relevant and rigorous.

2.4.2. Research Initiatives and Innovation

Quality assurance also extends into the research domain of electrical engineering, where it supports the development and dissemination of innovative technologies and solutions. QA processes help in maintaining the integrity and validity of research outcomes by ensuring that studies are well-designed, methodologies are properly implemented, and results are rigorously evaluated. This level of scrutiny is essential for fostering a culture of excellence and innovation, which drives the field forward. By adhering to strict QA standards, research projects can achieve greater scientific accuracy and technological breakthroughs, which in turn can lead to commercial applications and enhancements in everyday technological devices and systems.

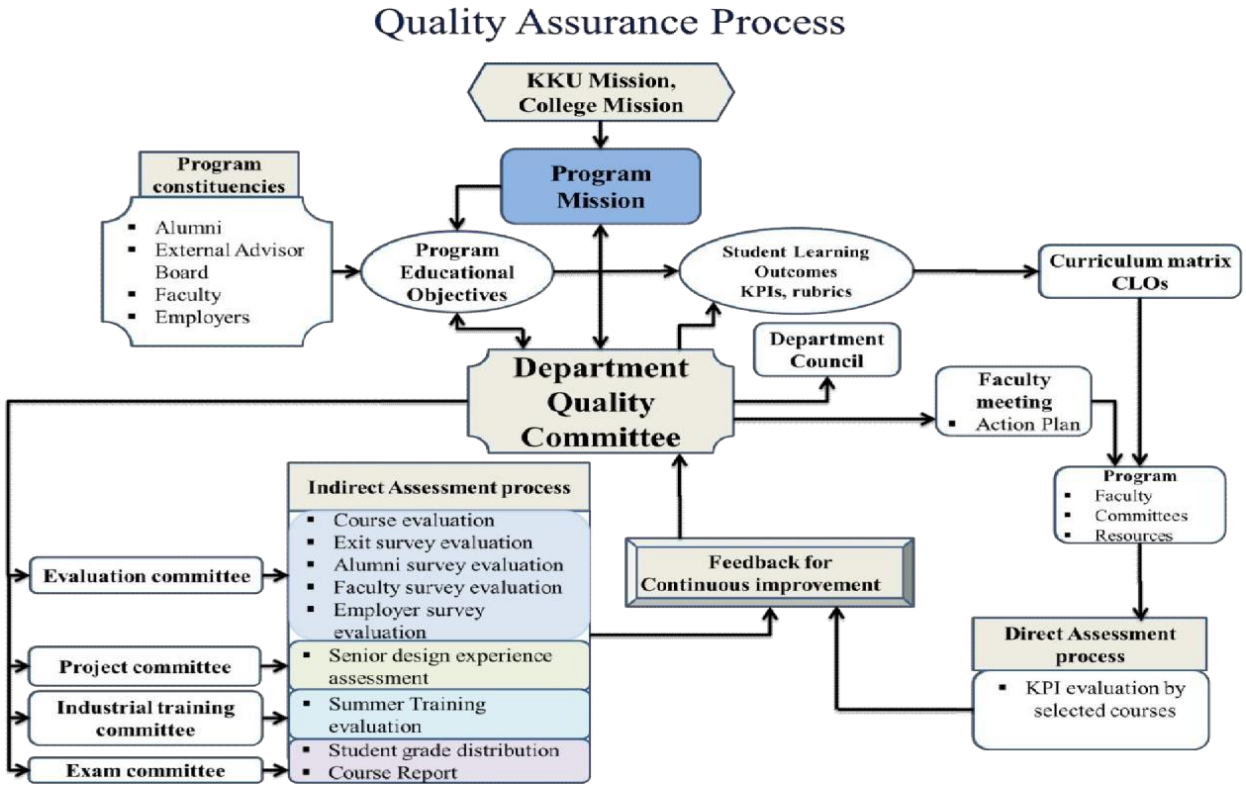

Figure 3 Quality Assurance Process

2.4.3. Technical Operations and Industry Compliance

Beyond academia, QA is crucial in the technical operations associated with electrical engineering. In an industry where products and systems must perform reliably under various conditions, QA ensures that all aspects of production, from design to manufacturing to implementation, meet stringent safety and performance standards. Compliance with these standards prevents costly failures and ensures the safety of both the end-users and those

involved in the production process. Quality assurance protocols, such as regular testing and certification, help companies avoid the legal and financial repercussions of delivering substandard or unsafe products.

2.4.4. Accreditation and Professional Standards

Maintaining compliance with national and international accreditation bodies is another fundamental aspect of QA in electrical engineering. Accreditation not only underscores the credibility of educational programs but also enhances their attractiveness to prospective students and employers. It serves as a benchmark for quality that prospective students and faculty rely on when choosing an institution. Furthermore, accreditation often involves regular reviews that prompt institutions to continuously elevate their standards, thereby improving the quality of education and research over time.

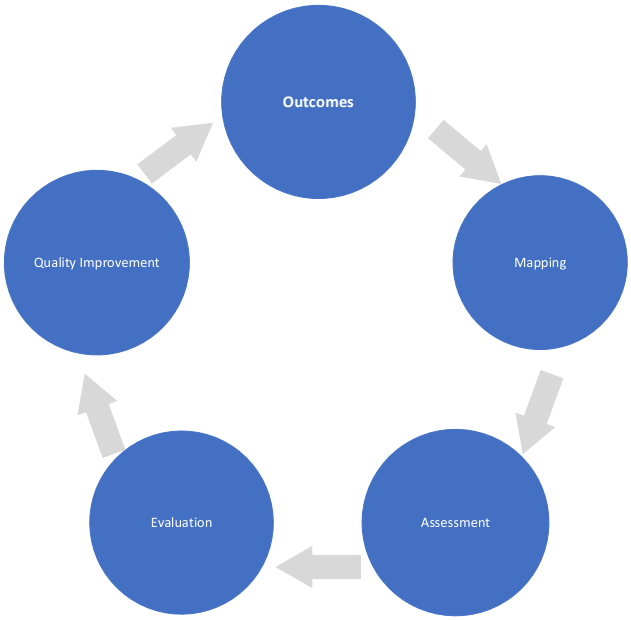

Figure 4 Program Quality Assurance Cycle

2.4.5. Safety and Ethical Considerations

Lastly, the importance of QA in electrical engineering cannot be overstated when it comes to safety and ethics. Electrical engineers often work on systems that affect public safety, such as power generation and distribution, telecommunications, and electronic devices. Quality assurance processes ensure that engineers adhere to the highest safety standards and ethical guidelines during the design, testing, and implementation phases of their projects. This vigilance helps prevent accidents, reduces the risk of malfunctions, and ensures the ethical deployment of new technologies.

2.5 Processes in Program Quality Assurance

Program quality assurance in electrical engineering departments involves a meticulous and structured approach designed to ensure the highest standards of education and research. By employing a range of processes such as periodic reviews, continuous monitoring, and curricular adaptations, departments can maintain alignment with the evolving demands of technology and industry. These efforts are crucial for maintaining accreditation standards, enhancing the educational experience, and preparing students for professional success.

2.5.1. Periodic Reviews

Periodic reviews are a cornerstone of program quality assurance, providing a systematic evaluation of the curriculum, teaching methods, and educational outcomes. These reviews are typically conducted on an annual or biennial basis and involve comprehensive audits of course content, instructional methods, and program objectives. The goal is to identify areas where the program excels and areas that require improvement. Reviews often involve internal committees and can also include external experts from academia or industry, who bring an unbiased perspective to the evaluation process.

2.5.2. Continuous Monitoring

Continuous monitoring is another vital aspect of quality assurance. This process involves the ongoing collection and analysis of data related to various facets of the program. Key performance indicators (KPIs) such as student retention rates, graduation rates, job placement rates, and student performance on standardized assessments are tracked regularly. This data helps in making informed decisions about program modifications and resource allocation. Continuous monitoring ensures that any potential issues are identified and addressed promptly, thereby preventing minor challenges from evolving into significant problems.

2.5.3. Curriculum Adaptation

To ensure that graduates remain competitive in the job market, electrical engineering programs must continuously adapt their curricula to reflect the latest technological advancements and industry needs. This involves integrating new scientific discoveries, emerging technologies, and engineering practices into the curriculum. Adaptation may also include the development of new courses or the revision of existing ones to include new theories, tools, and techniques. Engaging with industry stakeholders, alumni, and advisory boards is crucial in this process, as they provide valuable insights into the skills and knowledge that are most in demand.

2.5.4. Curriculum Assessment

Curriculum assessment is a focused process where specific components of the curriculum are evaluated for their effectiveness in achieving learning outcomes. This involves assessing not only the content but also the pedagogical approaches used to deliver that content. Techniques such as surveys, quizzes, exams, and project evaluations help gather detailed feedback on the curriculum's effectiveness. This feedback informs adjustments and enhancements to course offerings and teaching methodologies, ensuring that the curriculum remains rigorous and relevant.

2.5.5. Student Feedback Systems

Incorporating student feedback is essential in the continuous improvement of program quality. Feedback mechanisms such as course evaluations, suggestion boxes, and forums are used to gather students' perspectives on their educational experiences. This feedback is crucial for understanding students' needs and concerns, which can vary widely across different cohorts. Regularly soliciting and acting on student feedback demonstrates a commitment to student-centered learning and continuous improvement.

2.5.6. Faculty Evaluations

Faculty evaluations are another critical component of program quality assurance. These evaluations assess the effectiveness of faculty in teaching, research, and service. They can include peer reviews, student evaluations, self-assessments, and reviews of scholarly work. The insights gained from these evaluations help identify professional development needs and inform decisions related to tenure, promotion, and compensation. Furthermore, they ensure that faculty members are effectively contributing to the program's goals and maintaining high standards of teaching and research.

2.5.7. Ongoing Accreditation Activities

Maintaining accreditation is vital for electrical engineering programs. Accreditation processes provide external validation of the quality of a program's educational offerings. Preparing for accreditation involves a thorough review of the program against the standards set by accrediting bodies. This often includes compiling extensive reports and hosting site visits by accrediting teams. Ongoing accreditation activities ensure that the program not only meets the required standards but also commits to continuous improvement based on the accrediting body's feedback.

2.5.8. Monitoring and Evaluation Mechanisms

The Electrical Engineering Program implements systematic monitoring and evaluation mechanisms to assess academic performance, ensure achievement of Program Learning Outcomes (PLOs), and support continuous quality improvement in alignment with the King Khalid University Quality Management System and NCAAA standards.

- ***Program Learning Outcomes (PLO) Assessment***

The Program conducts a structured PLO assessment cycle to evaluate the extent to which students achieve the intended learning outcomes. PLO assessment is carried out using direct and indirect assessment tools, and the results are analyzed periodically by the relevant academic committees. Assessment findings are documented and used to identify strengths, gaps, and required improvement actions.

- ***Key Performance Indicator (KPI) Tracking***

Key Performance Indicators (KPIs) are identified in alignment with program goals and university strategic objectives. KPI data are collected, analyzed, and reviewed on a regular basis to monitor program effectiveness and efficiency. KPI results are reported through official quality reports and are used to support evidence-based decision-making.

- ***Annual Program Report (APR)***

An Annual Program Report (APR) is prepared to provide a comprehensive evaluation of program performance. The APR integrates findings from PLO assessments, KPI analysis, student feedback, and other performance indicators. The report highlights achievements, challenges, and recommended improvement actions, and is reviewed by the Department and College Councils.

- ***Program Goals Evaluation***

The achievement of program goals is evaluated periodically using quantitative and qualitative performance data. The evaluation ensures that program goals remain aligned with stakeholder expectations, labor market needs, and institutional strategic priorities. Evaluation outcomes are documented and incorporated into program improvement plans.

- ***Benchmarking***

Where applicable, benchmarking is conducted to compare program performance with national and international peer institutions. Benchmarking results are used to identify best practices, enhance competitiveness, and inform strategic improvement initiatives.

2.6 Implementing Quality Management in Curriculum Design

In the Electrical Engineering Department, implementing Quality Management System (QMS) components within curriculum design is a strategic process aimed at continuous improvement and alignment with both academic and professional standards. This critical endeavor ensures that the curriculum not only meets but also anticipates the needs of the industry, preparing students to excel in their future careers. Here's an elaboration on how the department integrates quality management into its curriculum design:

2.6.1. Integration of Industry Feedback

The curriculum is regularly reviewed and updated with significant input from industry professionals. This feedback is crucial as it provides insight into the current trends, technologies, and skills demanded by employers. By incorporating such feedback, the department ensures that its courses are relevant and that graduates are well-prepared for the workforce. Industry advisory panels, guest lectures, and internship feedback are among the key sources of industry insights.

2.6.2. Regular Updates to Course Materials

To keep pace with rapid technological advancements and changes in industry practices, the department commits to regularly updating its course materials. This involves revising textbooks, lab exercises, and project work to reflect new knowledge and tools. Faculty members are encouraged to stay abreast of their fields through continuous professional development and to integrate their research findings and the latest industry practices into their teaching.

2.6.3. Ensuring Learning Outcomes Align with Standards

The department meticulously designs its curriculum to ensure that all learning outcomes align with professional and academic standards. This alignment is critical for accreditation purposes and for maintaining the integrity and reputation of the educational programs offered. Learning outcomes are clearly defined for each course and are mapped to both program-level outcomes and broader educational objectives.

2.6.4. Utilization of Continuous Feedback Mechanisms

To adapt and enhance the curriculum effectively, the department employs various continuous feedback mechanisms. These include:

- ***Student Evaluations:*** Regular course evaluations by students provide direct feedback on teaching effectiveness and curriculum relevance.
- ***Peer Reviews***: Faculty members review each other's courses and teaching methods, offering constructive feedback for improvement.
- ***Alumni Surveys:*** Feedback from graduates provides insights into the long-term effectiveness and relevance of the curriculum.

2.7 Quality Manuals and Practices

The Electrical Engineering Department has established a comprehensive Quality Manual that meticulously outlines all procedures related to the Quality Management System (QMS), extending from student admissions to the tracking of graduates. This manual ensures rigorous adherence to quality standards across all department operations, which is crucial for maintaining the integrity and effectiveness of the educational programs. The manual is reviewed and updated regularly to respond to new educational guidelines, technological advancements, and feedback from stakeholders. This dynamic updating process ensures that the department remains aligned with the best practices and standards in engineering education.

Table 2 Key QMS Documents

Document Type	**Description**
Admission Policies	Criteria and procedures for student selection and enrollment
Graduate Tracking	Strategies for monitoring the professional progress of alumni
Review Protocols	Timelines and procedures for periodic reviews to ensure continuous improvement.

2.8 Quality Planning and Review Cycles

Quality planning and review cycles form the backbone of the department's efforts to uphold and enhance educational quality. This systematic approach involves setting strategic annual goals, designing and revising courses, and implementing changes based on evaluative feedback. The cycles are structured to assess educational outcomes rigorously and align them with both industry demands and technological trends. This process ensures that the curriculum

is not only relevant but also robust, preparing students to meet the challenges of the modern engineering landscape effectively.

2.8 Relationship of Quality Assurance to Accreditation

Quality Assurance in the Electrical Engineering Department is intrinsically linked to accreditation. It serves as a structured framework that accreditation bodies utilize to assess the quality of educational programs. By continuously improving quality, the department ensures compliance with accreditation standards and demonstrates its commitment to excellence. This ongoing process is vital for maintaining accreditation and for fostering trust and confidence among students, employers, and the academic community.

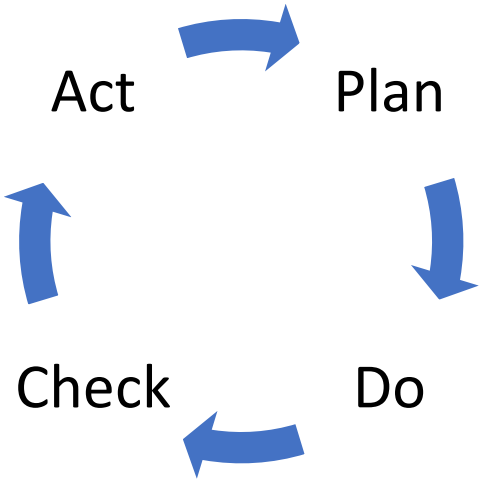

Figure 5 Quality Planning and Review Cycle

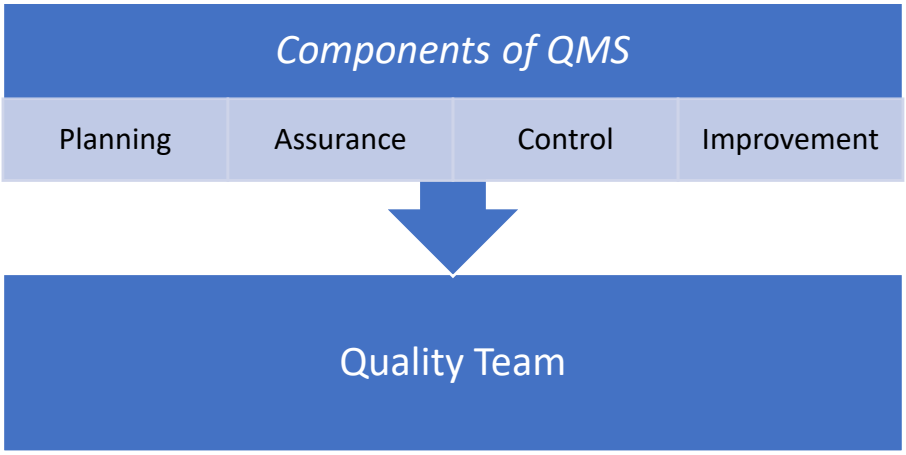

Figure 6 QMS Component Interaction

2.9 Components of Quality Management System

The QMS in the Electrical Engineering Department is comprised of several key components, each dedicated to ensuring that the educational offerings meet and exceed established standards. These components include.

- ***Quality Planning***: Setting objectives and outlining methodologies to achieve educational and administrative excellence.
- ***Quality Assurance***: Systematic activities designed to implement and meet the quality standards.
- ***Quality Control***: Regular monitoring of outcomes to ensure compliance with the desired educational standards.
- ***Quality Improvement***: Iterative enhancements based on analytical feedback, aimed at elevating the educational process and outcomes.

Table 3 Components of QMS and Their Functions

Component	**Function**
Quality Planning	Define objectives and processes to achieve them.
Quality Assurance	Implement activities to meet quality standards.
Quality Control	Monitor outcomes to ensure alignment with standards.
Quality Improvement	Adjust and enhance processes based on feedback and review outcomes.

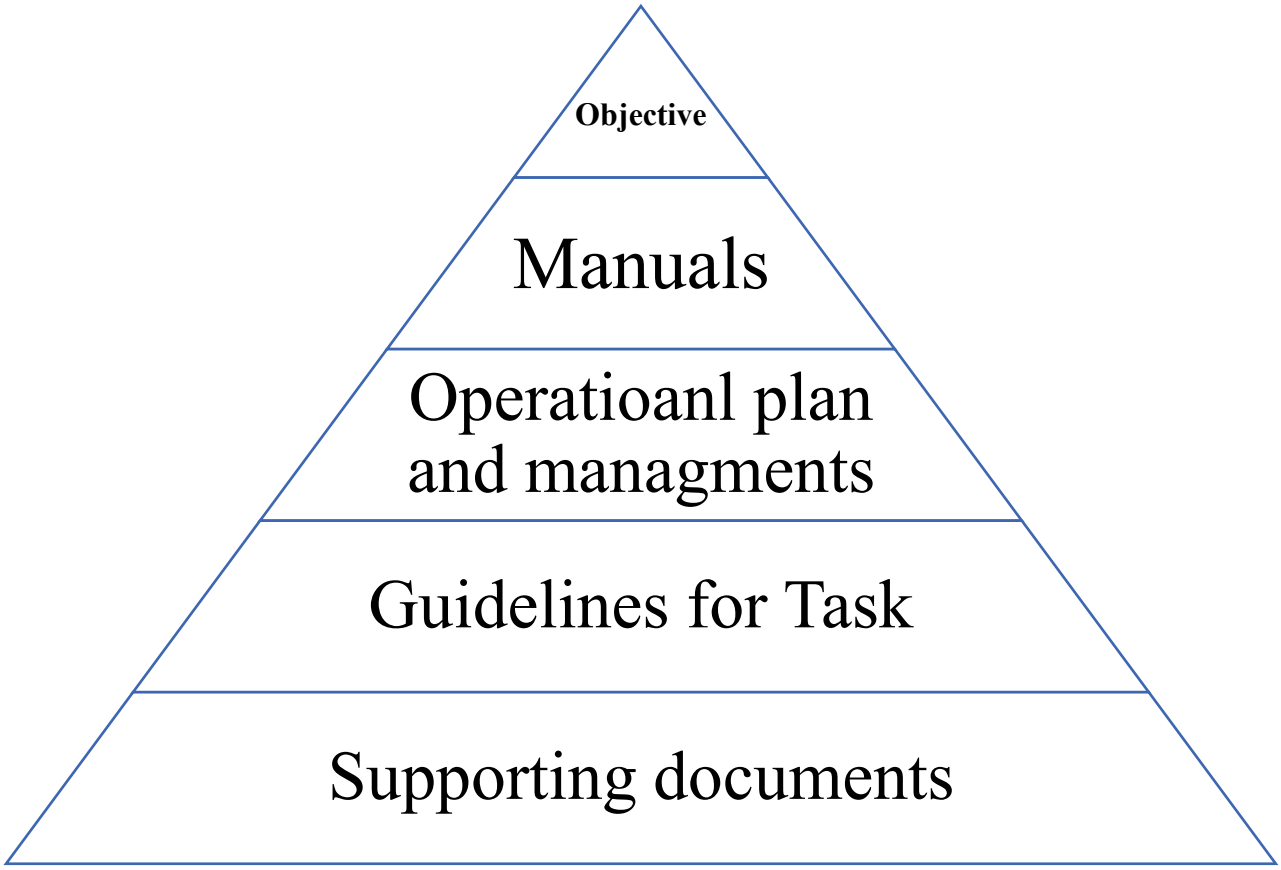

Figure 7 Program QMS documentation structure

2.10 General Requirements for Quality Management System (QMS) Implementation

In the context of the Electrical Engineering Department, the implementation and maintenance of a Quality Management System (QMS) are crucial for ensuring the continuous improvement and alignment of the department's operations with the standards set by the National Commission for Academic Accreditation and Assessment (NCAAA), stakeholder expectations, and strategic departmental goals. The Vice Deanship of Educational Affairs and Development plays a pivotal role in orchestrating these efforts, as outlined below:

2.11.1. Process Sequence and Management

Determine Process Sequence and Related Processes: The Vice Deanship is responsible for identifying and outlining the sequence of processes required within the QMS. This includes defining how various processes interact and ensuring that they are logically structured to meet the department's quality objectives efficiently.

2.11.2. Criteria and Operational Mechanisms

Determine Criteria, Operational Mechanism, and Effective Process Control: Establishing clear criteria for all quality processes is vital. The Vice Deanship ensures that these criteria are not

only well-defined but are also accompanied by robust operational mechanisms that facilitate effective control and management of these processes.

2.11.3. Resource Allocation

Ensure Adequate Resources and Accurate Data, to support process excellence and monitoring, the Vice Deanship ensures that sufficient resources (human, financial, technological) are available. They also oversee the gathering and validation of data used in quality assurance activities, crucial for accurate process evaluation and decision-making.

2.11.4. Monitoring and Evaluation

Monitor, Measure, and Analyze Process Achievement or KPIs Achievement: Regular monitoring and measuring of processes against key performance indicators (KPIs) allow the department to assess the effectiveness of the QMS. The Vice Deanship analyzes these metrics to identify areas of success and those needing improvement.

2.11.5. Continuous Improvement

Execute Opportunities for Improvements, Preventive and Corrective Control: The Vice Deanship initiates and implements improvement strategies based on the data and feedback collected through the QMS. This involves both preventive measures to avoid potential issues and corrective actions to address existing problems.

2.11.6. Compliance and External Resources

Manage Major Processes and External Resources: All major processes under the QMS are managed in accordance with the guidelines set by the College Council and University Council, aligning with NCAAA requirements. Additionally, when external resources or services are needed, the Vice Deanship ensures these meet the necessary standards and are effectively integrated into department processes.

2.11.7. Quality Practices

These procedures and practices are foundational to implementing an effective Quality Management System (QMS), as outlined in Table 1. They ensure that the organization not only meets quality standards but also continually enhances its operational efficiency and effectiveness.

Required Procedures:

- Document Control.
- Control of Records.

- Self-Study or Internal Audit.
- Risk Management.
- Improvement Initiatives.

Management Supporting Procedures:

- Self-Study Report (SSRp).
- Human Resource Development (HRD).
- Stakeholders' feedback (survey and action plans).
- QMS monitoring.

Table 4 Major processes for effective QMS implementation

S. No	Name of the Activity	Every Semester	Annually	Every 5 Years	Responsibilities	Stakeholder Involved
1	Program's Mission, Vision, Goals, Objective and Learning Outcome preparation and review			✓	College board/College's Committees /Program Advisory Committee	Students, Staff, Employers, NQF, Advisory Committee
2	Program Specification Review			✓	VD-ED	Staff
3	Course Report	✓			Course Coordinator	Staff
4	Course Recommendation Reporting	✓	✓		Plans and Curricula Committee	Staff
5	Course File Preparation and Submission	✓			Course Coordinator	Staff
6	Program KPI Report Preparations and Analysis		✓		Quality Assurance Committee	Staff
7	Annual Program Report		✓		Quality Assurance Committee	Staff
8	Program Assessment, Recommendations and Conclusion		✓		Quality Assurance Committee	Staff and Advisory Committee
9	Program Review and Evaluation (SWOT Analysis)			✓	VD-ED	Staff and Advisory Committee

S. No	Name of the Activity	Every Semester	Annually	Every 5 Years	Responsibilities	Stakeholder Involved
10	Program Self Study Report Development			✓	SSRp Committee	Staff
11	Course Evaluation Survey	✓			Measurement and Assessment Unit/Quality Assurance Committee	Students
12	University Experience Survey (Mid-Level Students)		✓		Measurement and Assessment Unit/Quality Assurance Committee	Students
13	Program Evaluation Survey (Final Level Survey)		✓		Measurement and Assessment Unit/Quality Assurance Committee	Students
14	Exit Student Survey for Student Attributes		✓		Measurement and Assessment Unit/Quality Assurance Committee	Students
15	Employer Survey for Student Attributes		✓		Measurement and Assessment Unit/Quality Assurance Committee	Employers
16	Alumni Surveys for Student attributes		✓		Measurement And Assessment Unit/Quality Assurance	Program Alumni
17	Employer Survey		✓		Measurement and Assessment Unit/Quality Assurance Committee	Employers
18	Alumni Survey		✓		Measurement and Assessment Unit/Quality Assurance Committee	Program Alumni

2.12 Annual program Report

The figure 8 provided outlines the process of preparing and evaluating the Annual Program Report (APR) in program. This systematic approach ensures thorough documentation and

evaluation of course effectiveness and program quality over the academic year. Here's a breakdown of each step depicted in the flowchart:

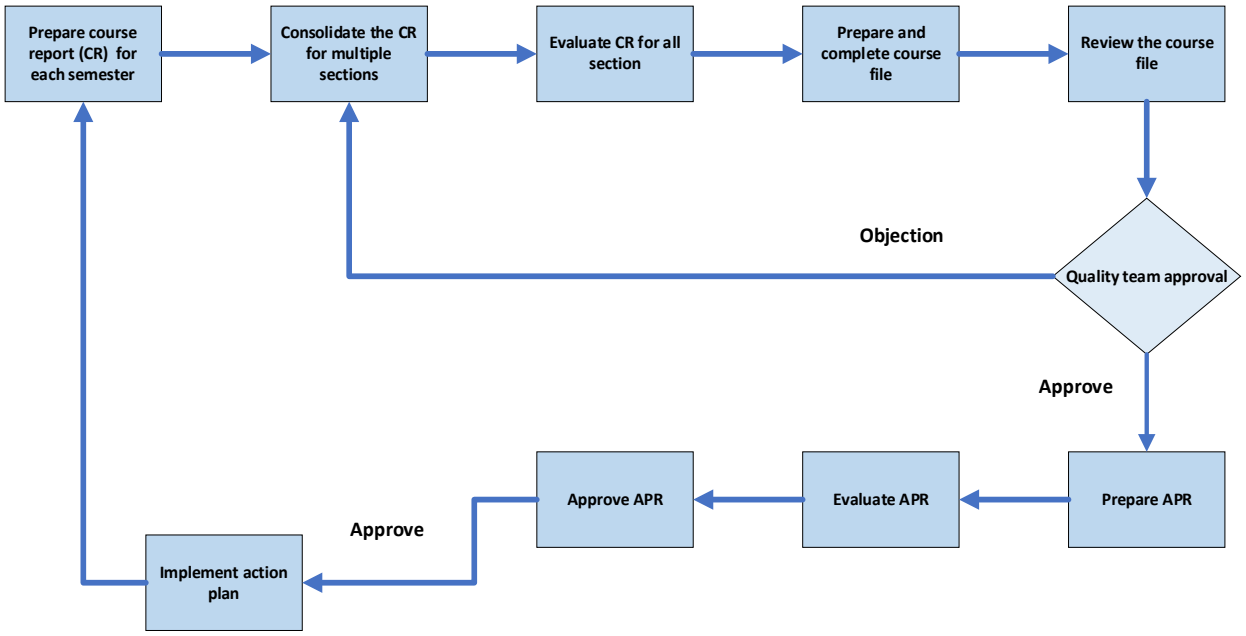

Figure 8 Process of preparation and evaluation of APR

- ***Prepare Course Reports for Each Group (Course Instructors):*** Course instructors are responsible for preparing detailed reports for their respective courses each semester, documenting student performance, instructional effectiveness, and any issues encountered.
- ***Prepare Consolidated Course Report (Course Coordinator):*** The Course Coordinator compiles all individual course reports into a consolidated report. This comprehensive document provides an overview of the academic performance and challenges within the entire course offering.
- ***Evaluate Consolidated Course Report:*** The consolidated course report is evaluated by the Department Council and the Department's Quality Committee. This step involves a detailed review to assess the overall effectiveness of the course offerings and identify areas needing improvement.
- ***Prepare and Compile the Course File:*** The Quality Assurance Committee at the College compiles all relevant documents and evaluations into the Course File, which serves as the official record for the course's performance over the semester.
- ***Review the Course File (Quality and Development Committee at the program):*** The Course File undergoes a final review by the Quality and Development Committee at

the program. They approve the file if it meets all required standards or send it back for further revision if any objections are raised.

- ***Prepare Annual Program Report:*** Concurrently, the program Quality Committee prepares the Annual Program Report, summarizing the year's academic achievements, challenges, and the effectiveness of the quality processes in place.
- ***Evaluate Annual Program Report (Quality and Development Committee at the College)***: The Annual Program Report is then evaluated by the Quality and Development Committee to ensure it accurately reflects the program's status and quality metrics for the year.
- ***Approve Program Report (College Council):*** Upon satisfactory evaluation, the Program Report is forwarded to the College Council for final approval. This endorsement is crucial for the implementation of any suggested improvements.
- ***Implementation and Monitoring:*** Once approved, the recommendations within the Program Report are implemented. Continuous monitoring is crucial to assess the effectiveness of these changes and make further adjustments as needed.

2.13 Self-Study Report (SSR)

The figure 9 shows the outlines the process of preparing a Self-Study Report (SSR) for an undergraduate program, crucial for accreditation and continuous improvement. This systematic approach integrates various data sources and evaluation mechanisms to ensure comprehensive self-assessment. Here's a breakdown of each step in the

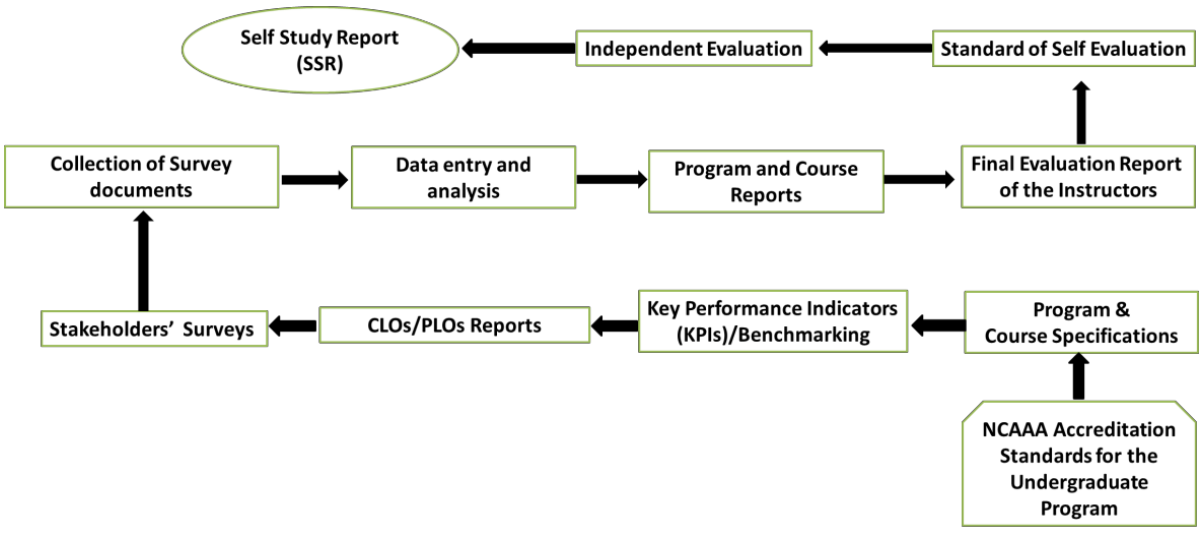

Figure 9 Process of Self Study Report preparation

- ***Collection of Survey Documents:*** The process begins with the collection of relevant survey documents. These are essential data sources that provide insights into different aspects of the educational program from various stakeholders.
- ***Data Entry and Analysis:*** Collected data is systematically entered and analyzed. This step is crucial for transforming raw data into actionable insights that inform the rest of the self-study process.
- ***Program and Course Reports:*** Using the analyzed data, detailed reports on individual courses and the overall program are prepared. These reports highlight strengths, weaknesses, and areas for improvement in the curriculum and teaching methods.
- ***Key Performance Indicators (KPIs)/Benchmarking:*** The process involves identifying and evaluating key performance indicators (KPIs) against established benchmarks. This helps measure the program's effectiveness relative to set standards or comparable programs.
- ***Program & Course Specifications:*** Detailed specifications for each course and the overall program are developed or updated based on the insights gained from KPIs and course reports. These specifications ensure that the program meets educational objectives and accreditation standards.
- ***NCAAA Accreditation Standards for the Undergraduate Program:*** The program and course specifications are aligned with the National Commission for Academic Accreditation & Assessment (NCAAA) standards. Compliance with these standards is essential for accreditation.
- **Stakeholders' Surveys**: Surveys are distributed to stakeholders, including students, faculty, and industry partners, to gather feedback on the program's effectiveness and areas for improvement.
- ***CLOs/PLOs Reports:*** Course Learning Outcomes (CLOs) and Program Learning Outcomes (PLOs) reports are prepared, detailing the achievement of educational objectives at both the course and program levels.
- ***Final Evaluation Report of the Instructors***: A comprehensive evaluation report of the instructors is compiled, assessing teaching effectiveness and contribution to learning outcomes.
- ***Independent Evaluation:*** An independent evaluation of the Self-Study Report is conducted to ensure objectivity and comprehensiveness.

- ***Standard of Self Evaluation***: The SSR is compared against a standard set of self-evaluation criteria to ensure it meets all expected quality and integrity benchmarks.
- ***Monitoring:*** Continuous monitoring is integral to the process, ensuring that all activities are aligned with the goal of maintaining and enhancing program quality.

2.14 Data Collection, Validation, and Reporting Mechanism

The Electrical Engineering Program adopts a structured and systematic approach to data collection, validation, and reporting to support effective monitoring, evaluation, and continuous quality improvement in alignment with the King Khalid University Quality Management System.

2.14.1. Role of the Department Statistics Committee

The Department Statistics Committee is responsible for overseeing systematic data collection, verification, analysis, and reporting related to academic and administrative performance. The committee ensures data accuracy, consistency, and reliability before official use in quality reports and institutional submissions.

2.14.2. **Types of Data Collected**

The following data are collected and maintained on a regular basis to support evidence-based decision-making:

- Student enrollment statistics
- Student retention and progression rates
- Graduation rates
- Graduate employability data
- Alumni feedback and tracer study results

These data are collected periodically and used for internal quality reviews, program evaluation, and accreditation purposes.

2.14.3. **Data Validation and Verification**

To ensure data accuracy and eliminate discrepancies:

- Collected data are reviewed and verified by the Department Statistics Committee.
- Data are cross-checked in collaboration with the **College Quality Unit**.
- Verified data are approved prior to inclusion in official reports such as KPIs, APRs, and accreditation documents.

2.14.4. **Data Reporting**

Validated data are documented and reported through official quality reports, including:

- Annual Program Reports (APR)
- KPI performance reports
- Statistical summaries required by the College and University

Chapter 3 Committees, Members and Tasks

3.1 Dean of COE

Role: The Dean of the College of Engineering (COE) oversees all academic, programmatic, managerial, and fiscal aspects of the college. They ensure the quality of instruction, maintain academic integrity, and are responsible for degree conferment and student progression.

Responsibilities: The Dean develops the college's strategic vision and aligns it with the university's goals, manages the budget, and oversees the ethical conduct of research. They are also responsible for faculty and staff development, promoting excellence in teaching, research, and community service.

Reporting and Compliance: The Dean reports to the Vice-Presidency of Academic and Educational Affairs and the Vice-Presidency for Development and Quality, ensuring adherence to university policies and fostering a culture of compliance.

3.2 Vice Dean for Educational Affairs and Development (VD-ED)

Role: The VD-ED is instrumental in enhancing educational quality and curriculum development within the COE. They oversee academic support systems and quality assurance processes.

Responsibilities: The Vice Dean leads curriculum enhancements, supports faculty and student development, and ensures that educational programs meet accreditation standards and industry needs.

3.3 Vice Deanship for Research and Postgraduate Studies

Role: This office focuses on advancing the COE's research initiatives and postgraduate programs, promoting innovation and fostering academic excellence.

Responsibilities: The Vice Deanship coordinates research activities, develops postgraduate programs, and facilitates the commercialization of research. They work to enhance the research profile of the college and ensure it meets global standards.

These roles collectively strengthen the COE's capacity to provide high-quality engineering education and to conduct cutting-edge research, positioning the college as a leader in both academic and industrial sectors.

3.4 Head of Department (HOD) of EE

The Head of Department of program serves as a pivotal role in managing both the day-to-day and strategic operations of the department. Here is a concise overview of the role and its key responsibilities:

- Academic Oversight and Curriculum Management: The HoD is primarily responsible for the academic integrity and curriculum adequacy of the department. They oversee curriculum updates, ensuring the content is current, relevant, and meets both educational standards and industry needs. This involves curriculum assessment, development, and occasionally, complete redesigns to integrate new technologies or theoretical advancements.
- Faculty Development and Management: The HoD plays a critical role in faculty recruitment, retention, and development. They assess faculty performance, encourage professional growth, and foster a supportive environment that promotes academic excellence. This includes organizing regular reviews and providing opportunities for faculty to upgrade their skills through workshops and seminars.
- Budget and Resource Allocation: Managing the department's budget, the HoD ensures that resources are allocated efficiently to maximize educational outcomes. This includes funding for research initiatives, educational tools, and infrastructure improvements. They negotiate with the college administration to secure necessary funding and manage expenditures to align with departmental priorities.
- Student Engagement and Support: The HoD addresses student academic issues, oversees advisement, and implements programs that support student welfare and academic success. They work closely with student affairs to ensure that student concerns are addressed promptly and effectively.
- Research Direction and Support: They enhance the department's research profile by fostering an environment conducive to research and innovation. This includes facilitating research collaborations, seeking external funding, and ensuring that research activities align with the department's strategic goals.
- Quality Assurance and Accreditation: The HoD ensures that the department meets accreditation standards and maintains high-quality educational offerings. They oversee the preparation for accreditation visits and the implementation of corrective actions arising from accreditation feedback.

3.5 Detailed Committee Structures and Functions in program

Each of these committees plays a crucial role in the smooth and effective operation of the department, contributing to its ability to deliver high-quality education and research outputs.

3.5.1. Timetable and Examination Committee

This committee is responsible for the organization and management of academic timetables and examination schedules within the department. It ensures that all courses are appropriately scheduled and that examinations are planned and conducted efficiently. This committee is further classified as parts academic courses, mid exam, final exam and graduation projects. Each subcommittee has a coordinator responsible for performing task for smooth flow of time table in program. Subcommittee in charge report to the coordinator of committee, coordinator reports to HOD.

3.5.1.1 Academic Courses Subcommittee

- This subcommittee arranges the schedule of all academic courses offered by the department each semester. It ensures that course timings do not overlap and are aligned with the availability of faculty and classrooms.
- The coordinator oversees the course scheduling process, liaising with faculty to accommodate their time preferences and special requirements.

3.5.1.2 Mid Exam Subcommittee

- Focused on the scheduling and administration of mid-term examinations, this subcommittee ensures that exams are evenly spaced and do not conflict with regular class schedules.
- The coordinator manages the logistical arrangements for mid-term exams, including room assignments, invigilation schedules, and the distribution of examination materials.

3.5.1.3 Final Exam Subcommittee

- This subcommittee organizes the final examinations schedule, ensuring compliance with university guidelines for exam spacing and duration. It also handles special arrangements for students requiring accommodations.
- The coordinator is responsible for finalizing the exam timetable, coordinating with the university's central examination services, and overseeing the security measures to maintain academic integrity.

3.5.1.4 Graduation Projects Subcommittee

- This subcommittee manages the timelines and evaluation schedules for graduation projects. It ensures that students receive timely feedback and that panel evaluations are scheduled efficiently.
- The coordinator arranges presentations and evaluation sessions, liaises with external examiners, and ensures that all graduation project assessments are completed within the academic year.

3.5.2. Academic Guidance and Students Affairs Committee

This committee focuses on the academic and personal well-being of students, providing guidance and support to help them achieve their educational and career goals. The Academic Guidance and Students Affairs Committee within the program is structured to address various facets of student support and development. This committee is divided into three key subcommittees, each focusing on distinct areas of student life and academic progression Each subcommittee operates under the broader umbrella of the Academic Guidance and Students Affairs Committee, ensuring a cohesive approach to student support. Coordinators from each subcommittee regularly report to the main committee to update on activities, progress, and any challenges faced. The committee, in turn, aligns its strategies with the department's educational goals and reports to the HOD for further strategic direction and support.

3.5.3.1 Academic advising

This subcommittee is dedicated to providing comprehensive academic advising to students throughout their academic journey. It ensures that students receive the guidance needed to navigate their course selections and academic requirements effectively.

- Offer one-on-one counseling sessions to help students understand degree requirements and plan their academic schedules.
- Monitoring Academic Progress: Track the academic progress of students to proactively address any issues that might affect their performance.
- Equip students with resources and tools that help in making informed decisions about their educational paths.

3.5.3.2 Student Affairs Subcommittee

This subcommittee focuses on the broader aspects of student life, encompassing both academic and non-academic issues that impact student well-being and college experience.

- Implement support systems for handling academic challenges, personal issues, and any conflicts that may arise during the student's tenure at the college.
- Engagement and Well-being: Organize events and workshops that promote a balanced college life, focusing on mental health, social engagement, and academic success.
- Serve as the primary point for addressing student grievances, ensuring a fair and effective resolution process.

3.5.3.3 Summer Training Subcommittee

The Summer Training Subcommittee is tasked with overseeing and facilitating summer internships and training programs that are crucial for the practical education of students.

- Secure and manage placements for students in industry settings that align with their academic studies and career aspirations.
- Develop and maintain partnerships with industry leaders to ensure a continuous influx of training opportunities.
- Monitor and assess the performance of students during their internships, providing feedback and support to maximize their learning experiences.

3.5.3. Curriculum and Courses Committee

The primary role of this committee is to oversee the curriculum and ensure that course offerings remain relevant and rigorous, meeting the educational standards and needs of the industry.

- Regularly reviewing and updating the curriculum to incorporate new knowledge and technologies, and to align with industry demands and accreditation standards.
- Evaluating course effectiveness through student feedback and academic performance data, making recommendations for course improvements or developments.
- Approving new courses and modifications to existing courses, ensuring they contribute positively to the educational objectives of the department.

3.5.4. Higher Studies for Masters and Research Committee

The Higher Studies for Masters and Research Committee in the College of Engineering plays a pivotal role in advancing the department’s postgraduate educational and research agendas. To effectively manage its broad scope of responsibilities, the committee is subdivided into three focused subcommittees: Scholarship, MSc Plan, and Research and Project. Each subcommittee within the Higher Studies for Masters and Research Committee works closely together to ensure a holistic support system for postgraduate students. Regular meetings are

held to coordinate efforts across the subcommittees, with comprehensive reports generated to inform the main committee of progress, challenges, and achievements. The main committee then integrates these insights into the broader strategic objectives of the department, maintaining alignment with the college's goals for postgraduate education and research.

3.5.4.1 Scholarship Subcommittee

This subcommittee is dedicated to managing and facilitating scholarship opportunities for postgraduate students. Its primary aim is to support students financially and academically through their studies, enhancing the accessibility and appeal of the department's master's programs.

- Identify potential scholarship opportunities within and outside the institution. Manage applications and awards processes to ensure students receive necessary financial support.
- Act as the primary contact point between students and scholarship providers, including industry partners, academic institutions, and government bodies.
- Monitor the progress of scholarship recipients, ensuring they meet the academic and performance criteria set by their sponsors and the department.

3.5.4.2 M.Sc. Plan Subcommittee

Focused on the academic structuring and content delivery of the Master of Science programs, this subcommittee ensures that the curriculum is current, rigorous, and aligns with both industry needs and academic standards.

- Regularly review and update the MSc curriculum to incorporate new research findings, technological advancements, and industry trends.
- Ensure that all course offerings meet the accreditation standards and university academic policies.
- Track the academic progress of MSc students, providing guidance and support to ensure they meet their educational objectives.

3.5.4.3 Research and Project Subcommittee

This subcommittee spearheads the research initiatives for postgraduate students, facilitating a supportive environment for research and innovation.

- Oversee the research projects undertaken by postgraduate students, ensuring they are of high quality and contribute significantly to the field.

- Secure funding for research projects and ensure that adequate resources are available for students and faculty involved in research.
- Foster collaborations with industry and academic partners to enhance the research opportunities and exposure of postgraduate students.

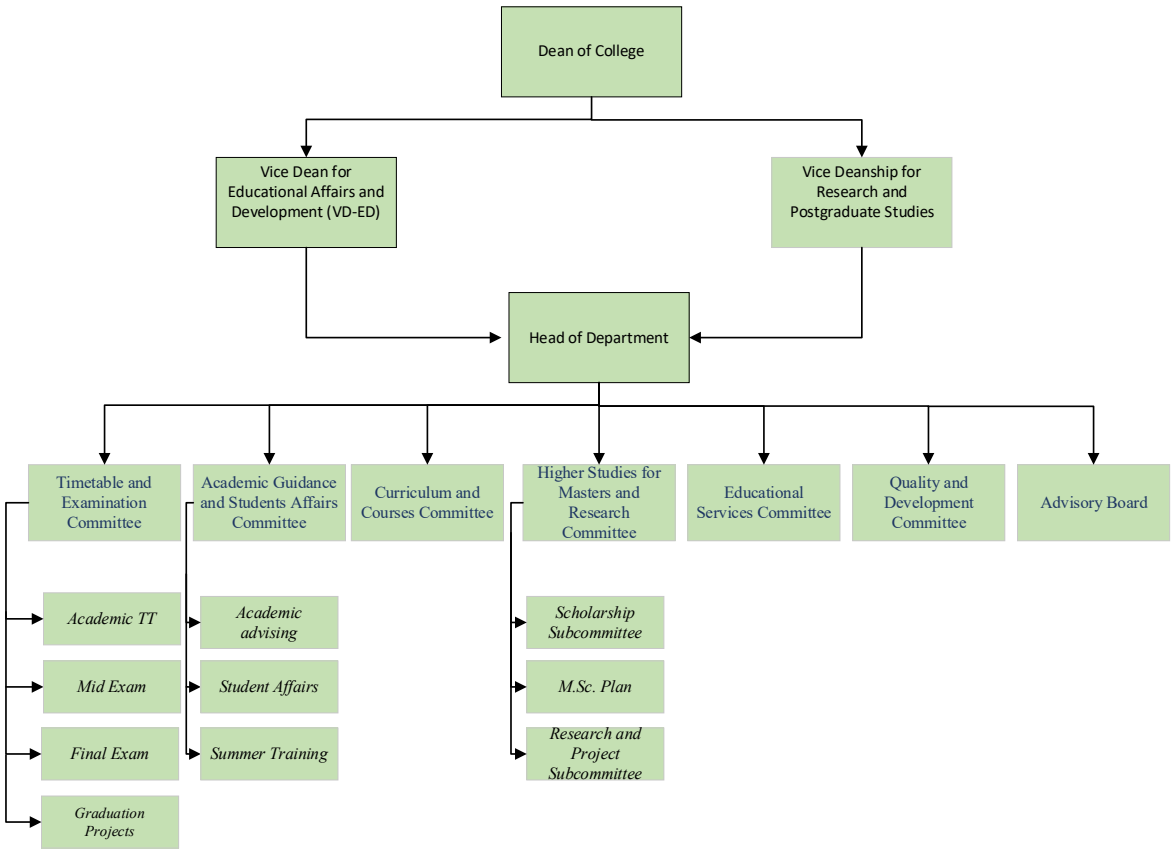

Figure 10 committees' hierarchy

3.5.5. Educational Services Committee

Responsible for managing and supporting the logistical and operational needs related to educational activities in the department.

- Ensuring that classrooms, laboratories, and other learning environments are well-equipped and maintained to support teaching and learning activities.
- Managing the procurement of educational materials and resources, including software, lab equipment, and textbooks.
- Coordinating with IT services and other support departments to ensure that technological and infrastructural needs are met.

3.5.6. Quality and Development Committee

The Quality and Development Committee in the College of Engineering is critical to maintaining and enhancing the quality of educational and administrative processes within the department. This committee plays a pivotal role in ensuring that all departmental functions adhere to established quality standards and undergo continual improvements to meet the evolving demands of education and industry. Developing strategies for ongoing departmental improvement based on feedback from stakeholders including students, faculty, and industry partners. Preparing for and managing accreditation processes, ensuring that the department meets all external standards and requirements.

3.5.6.1 Accreditation Management

NCAAA and ABET Accreditation: The committee is directly responsible for managing all aspects of accreditation processes related to the National Commission for Academic Accreditation and Assessment (NCAAA) and the Accreditation Board for Engineering and Technology (ABET). This includes preparing for accreditation visits, ensuring compliance with accreditation standards, and overseeing the submission of necessary reports and documentation.

3.5.6.2 Quality Assurance

***Monitoring and Evaluation*:** Implement and monitor quality assurance systems to evaluate the effectiveness of teaching, research, and administrative services. This includes regular assessments of academic programs to ensure they meet the criteria set forth by accreditation bodies.

***Feedback Integration**:* Collect and analyze feedback from students, faculty, and external stakeholders to identify areas for improvement. This feedback is crucial for adapting programs and services to better meet the needs of users.

3.5.6.3 Continuous Improvement

***Process Improvement Initiatives*:** Initiate and manage continuous improvement projects aimed at enhancing the quality of education and operations within the department. This involves updating processes and practices based on the latest educational trends and feedback from internal and external audits.

***Professional Development**:* Organize and promote professional development opportunities for faculty and staff to ensure they are up-to-date with the latest teaching methods, research advancements, and quality assurance practices.

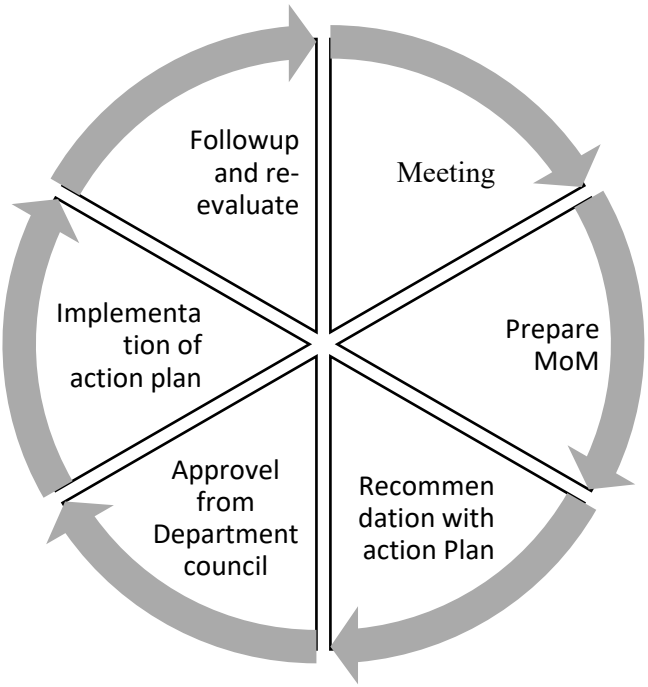

Figure 11 Work cycle of committee

3.6 Committee Operations and Documentation

3.6.1. Scheduling Meetings and Attendance

All committees within the Electrical Engineering Department, conduct periodic meetings to deliberate on various subjects pertinent to their specific roles and responsibilities. To standardize the documentation of these discussions, a dedicated meeting minutes format, termed Minutes of Meeting (MoM), has been instituted. This ensures that all discussions are recorded consistently and comprehensively. Department secretary is taking care of this MoM

3.6.2. Minutes of Meetings for Committee

The MoM format is crafted to capture the essence of the discussions, decisions, and recommendations made during the meetings. This structured documentation aids in ensuring that all committee recommendations and action plans are systematically monitored and assessed, thus facilitating the closure of the quality loop and ensuring continuous improvement.

3.7 Advisory Board

The Advisory Board for the program has been established to collaborate with the College and provide expert advice related to its educational and academic programs. The advisory board plays a crucial role in shaping the program strategic plan with College's strategic direction and enhancing its educational offerings.

Objectives of the Advisory Board

- Offer advice to support the program teaching, research, and service missions, leveraging external perspectives to enhance these areas.
- Advise the HOD, faculty, and other administrative officers on strategies for resource development and goal achievement.
- Help in placing students at employment sites, ensuring that they transition smoothly from education to professional environments.
- Facilitate cooperation and communication between the program and the broader community.
- Participate in setting priorities and ongoing planning activities to ensure the program remains aligned with industry needs and educational trends.
- Assist the program in adapting its programs to meet the demands of the labor market effectively.

3.7.1. Composition

The Advisory Board consists of 9-15 members drawn from academic circles, public and governmental agencies, businesses, industry, and alumni, HOD is also the member of this.

3.7.2. Member Selection

Members are selected and appointed by the Department and College of Engineering Board, subject to approval by the college board and the University President. The Committee chair may invite additional attendees as needed based on the agenda. The selected member has to contribute for one year extendable depending upon need contributions of the individual members.

3.7.3. Meetings

The board meets at least twice per year, following a structured procedure and some of the major points comes under the discussion like

- Necessary surveys and forms are provided to gather comprehensive feedback.
- Meeting minutes are documented and sent to all members for signatures. The Advisory Committee Action Plan Form ("ACAP") is used to track the implementation of recommendations.
- The effectiveness of implemented actions is reviewed in subsequent meetings to ensure they achieve the desired outcomes.

Chapter 4: The National Qualifications Framework for Saudi Arabia (NQF-KSA)

The National Qualifications Framework (NQF) serves as a standardized system designed to classify qualifications based on specific learning outcomes at varying levels. Its primary purpose is to create a cohesive structure for qualifications, facilitating clear communication and comparability both nationally and internationally. The NQF acts as a vital link between educational and training systems and the real-world requirements of the job market, ensuring that education and training are responsive to societal needs, aspirations, and capabilities. This responsiveness supports sustainable development across all life areas by aligning educational outcomes with the demands of modern work environments and societal expectations.

The structure of the NQF ensures that learners are equipped not only with the technical skills required for professional success but also with the ethical foundations and cognitive abilities to adapt and thrive in various life and work scenarios. This comprehensive approach to defining and delivering qualifications ensures that education and training are closely aligned with the evolving demands of a dynamic global environment.

4.1 Learning Domains

Learning domains within the NQF articulate the essential knowledge, skills, and values a learner must acquire to achieve a qualification at each specified level, which range from Level 1 to Level 8. These domains are structured to progress in scope and complexity as learners advance through the levels of the Framework.

4.1.1. Knowledge and Understanding

- *Extensive Deep Knowledge*: Involves a thorough understanding of facts, concepts, principles, theories, processes, and procedures pertinent to a specific area of learning, work, or profession.
- *Depth of Knowledge:* May be either general, covering a broad scope, or specialized, focusing on specific areas within a discipline.
- *Breadth of Knowledge*: Can extend from narrowly focused topics to multi-disciplinary fields.

Table 5 NQF Level Descriptors (Level-6)

Domain	Code	Program Learning Outcomes (PLOs)	NQF Level Descriptors of Learning Outcome – Level 6
Knowledge and understanding	1.1	Broad in-depth integrated body of knowledge and comprehension of the underlying theories, principles, and concepts in electrical engineering and related discipline	K1
	1.2	In-depth knowledge and comprehension of processes, materials, techniques, practices, conventions, and/or terminology in electrical engineering	K2
	1.3	A broad range of specialized knowledge and understanding informed by current developments in electrical engineering, profession, and related discipline	K3
	1.4	Knowledge and comprehension of research and inquiry methodologies	K4
Skills	2.1	Apply integrated theories, principles, and concepts in various contexts, related to electrical engineering, profession, and related discipline.	S1
	2.2	Solve problems in various complex contexts in in electrical engineering and related discipline.	S2
	2.3	Use critical thinking and develop creative solutions to current issues and problems, in various complex contexts, in electrical engineering, profession, and related discipline.	S3
	2.4	Use and adapt advanced processes, techniques, tools, instruments, and/or materials in dealing with various complex practical activities.	S4
	2.5	Carry out various complex practical tasks and procedures related to electrical engineering, professional practice, or related discipline.	S5
	2.6	Communicate effectively to demonstrate theoretical knowledge comprehension and specialized transfer of knowledge, skills, and complex ideas to a variety of audiences.	S6
	2.7	Select, use, and adapt various standard and specialized digital technological and ICT tools and applications to process and analyze data and information to support and enhance research and/or projects.	S7
Values, Autonomy and Responsibility	3.1	Demonstrate commitment to professional and academic values, standards, and ethical codes of conduct, and represent responsible citizenship and coexistence with others	V1
	3.2	Effectively plan for and achieve academic and/or professional self-development, assess own learning and performance, and autonomously make decisions regarding self-development and/or tasks based on convincing evidences.	V2
	3.3	Collaborate responsibly and constructively on leading diverse teams to perform a wide range of tasks while playing a major role in planning and evaluating joint work.	V3

- *Types of Knowledge*: Ranges from concrete to abstract concepts, and from segmented to cumulative knowledge structures.
- *Complexity of Knowledge*: Refers to how the types, depth, and breadth of knowledge are interwoven and applied.

4.1.2. Skills

- *Cognitive Skills*: These include the application of knowledge, critical thinking, problem-solving, inquiry, and creativity.

- *Practical and Physical Skills*: Entail the use of appropriate materials, devices, and tools, as well as the application of motor and manual skills with ingenuity.
- *Communication and Information Technology Skills*: Cover effective written, verbal, and non-verbal communication, numeracy, and the proficient use and production of information and communication technology.

4.1.3. Values

- *Academic and Professional Ethics:* Upholding the highest standards of integrity and ethical behavior in academic and professional settings.
- *Continued Self-learning and Autonomy*: Commitment to lifelong learning and the ability to work independently.
- *Teamwork and Responsibility:* Demonstrating effective collaboration skills and accountability in both individual and group settings.

4.2 Qualification Components

The regulations ensure a structured approach to measuring academic effort and aligning educational outcomes with the expectations set by the accreditation bodies, thereby facilitating a comprehensive framework for academic progression and credentialing

4.1.4. Determination of Credit Hours (Accredited Units)

According to the Education and Training Evaluation Commission, credit hours represent a measure of the amount of learning required to obtain a qualification, expressed in units of time. These hours are quantified based on the time needed to achieve the learning outcomes associated with a qualification, where one credit hour equates to no less than 50 minutes of learning time. This structure is governed by the following principles:

- Credit Hours and Learning Expectations: The number of accredited units for each module or program indicates the expected volume of learning. This is linked to the actual hours of study involved in various learning activities, including lectures, supplementary classes, and laboratory work.

Table 6 Qualification Components

Item	Requirements according to NQF	Program	Level of Compliance (to be completed by NCAAA Consultant)
Minimum credit hours (units) required	- Completion of a minimum of (120) credit hours (units) for Bachelor's qualification or equivalent.	161	The program meets the minimum of credit hours required.

Item	Requirements according to NQF	Program	Level of Compliance (to be completed by NCAAA Consultant)
	-Completion of a minimum of (24) credit hours (units) including advanced courses on a specific academic or vocational specialty after a Bachelor's Degree		
Program duration (Minimum number of years)	- The study duration to obtain the qualification is usually four years or a minimum of three (3) years for Bachelor or equivalent. - The study duration to obtain the qualification is one full-time year or equivalent.	5 Years (10 Levels)	The program meets the minimum duration required in years.
Minimum Actual (contact) hours	1800 contact hours for Bachelor's degree. 24 contact hours for Higher Diploma, Professional Master and Applied Master.	211	The program meets the minimum actual (contact) hours required.
Enrollment conditions (According to NQF)	- Obtaining a Secondary education qualification or equivalent. - Obtain a bachelor's degree or equivalent.	*Admission and Graduation Requirements	The Program meets the minimum requirements for students' enrolment at level 4 qualification.

- This term refers to the total number of study units in which a learner is permitted to enroll during a semester. Educational and training institutions set the minimum and maximum credit limits, typically not less than 12 units per semester for a full-time student, and 24 units per academic year across two semesters.
- A standard of 15 credit hours per semester is used as a benchmark for the expected amount of teaching and learning for regular learners at graduate levels, and 30 credit hours per academic year consisting of two semesters. This represents the minimum effort expected.
- For a bachelor's degree, the minimum teaching requirement is set at 120 credit hours.
- The minimum learning period for one semester is 15 weeks under a full-time system, or its equivalent in a part-time format.

4.1.5. Number of Credit Hours (Accredited Units) for Qualifications

- Achieving a bachelor's degree typically necessitates the completion of at least 120 credit hours, which generally spans (4-5) academic years in a full-time educational system.
- The duration of the program may vary based on the specialization. While most specializations require a minimum of 120 credit hours, certain fields may demand more extensive study and a greater number of credit units, particularly in vocational disciplines.
- The additional learning required for these specializations is recorded in the academic registry. Some fields, like medical specialties, may require up to 5 years of study or more under a full-time system.

Chapter 5 Academic Program Development and Review

5.1 Program Planning and Design

The curriculum design of the Electrical Engineering program at King Khalid University is guided by a commitment to high academic integrity, alignment with national and international standards, and responsiveness to the diverse needs of our student body. The implementation of the curriculum design adheres to relevant NCAAA qualification standards and includes a thorough recognition of curriculum contents and strategic educational approaches.

NCAAA qualification standards establish specific qualifications, course learning outcomes, and program learning outcomes, clarifying the purposes and associated credit guidelines and assessment criteria. Identifying appropriate curriculum contents such as course learning outcomes, program learning outcomes, and the strategic methods to achieve these outcomes is executed following detailed steps shown in the accompanying.

It is crucial to ensure that the variety of programs offered aligns with the university's mission, vision, and goals, as well as the needs of the Kingdom of Saudi Arabia. Program design, development, and approval are vital to maintaining appropriate academic standards. Special attention is given to relevant external reference points and benchmarks, which demonstrate a comparison of standards with those of nationally and internationally recognized institutions and organizations.

Adapting to international standards should respect the NCAAA's Standards for Quality Assurance and Accreditation of Higher Education Programs, the National Qualifications Framework (NQF), and any relevant national and international professional bodies. Proposals for new programs are considered within the college based on both academic and planning criteria, including resource implications and stakeholder input. The meetings are structured and objective, aiding in program improvement with clear decisions, including any recommendations for changes.

Proposed plans for the program must subsequently be submitted to higher authorities. The review process by these authorities considers the strategic plans of universities and colleges and their alignment with primary objectives. The final program planning agreement is approved by the KKU Plans and Curricula Committee and the University Council. After the program design is completed by the program design team, the approval process through the departmental council, university student plans and curricula committee, and the university council takes place before being submitted to the King Khalid University Council. It is ultimately authorized

to approve academic provisions within the university and is sent to the Supreme Council of the Ministry of Education for approval.

5.2 Major Changes

The process for implementing major changes follows specific steps, requiring discussions and approvals at various committee levels within the college before final approval by the KKU president and, subsequently, the Ministry of Education. Major changes in the curriculum design of the Electrical Engineering program at King Khalid University include

- Study plan adjustments.
- Program name revisions.
- Modifications to program learning outcomes.
- Changes in program/course total credits.
- Revisions to the program mission and goals.
- Course additions or removals (elective or compulsory).
- Changes to the offered degree name.

5.3 Minor Changes

These changes must also undergo a structured approval process, beginning with the college plans and curricula committee and concluding with final approval from the KKU president. Minor changes in the curriculum may include:

- Course code updates.
- Course name changes.
- Modifications to prerequisites.
- Adjustments to course learning outcomes.
- Transferring courses to different levels.
- Updates to teaching strategies.
- Changes in assessment methods and grade distribution.
- Course content changes (not exceeding 20%).

5.4 Program and Course Annual Monitoring and Reporting

Annual monitoring and reporting are essential for maintaining the quality and relevance of the Electrical Engineering program. This process includes the collection of statistical information on student recruitment, progression, and completion, and consideration of feedback from students and external agents such as professional and accreditation bodies. This reflective

process leads to continual improvement of the program, ensuring its alignment with current needs and standards. The quality assurance activities at the program level are presented in Table 6 below.

Table 7 The Quality Assurance and Accreditation Procedures at Programs/Faculty levels

Activity Name	Start of Semester	End of Semester	Annually	Every 5 years
Programs level Activities				
Strategic Plan Development				✓
Self-Scale Evaluation Report				✓
Program Specification Review				✓
Student's evaluation of the quality of the course		✓		
Course Report Preparation		✓		
Course Recommendation Reporting/Action Plan	✓		✓	
Course File Preparation and Submission		✓		
Program mission and goals SWOT Analysis Reparation and Reporting				✓
Program KPI Report Preparations and Analysis			✓	
Annual Program Report Preparation/Revision			✓	
Program Self- Study Report Development				✓
KPI Execution Follow-up		✓		
Advisory committee report			✓	
External reviewer report				✓

- *Program and College Missions Aligned with University Mission:*

The program mission aligns with the college and university missions, setting a foundational directive that guides the educational goals and outcomes.

- *Goals and Program Learning Outcomes:*

Specific goals of the program are established, which lead to defined Program Learning Outcomes (PLOs). These outcomes articulate what graduates are expected to know, do, and value by the end of their studies.

- *Curriculum Plan and Course Specifications:*

A detailed curriculum plan is developed based on the program's goals and learning outcomes. Course specifications are then designed to ensure each course contributes effectively to the PLOs.

- *Mapping and Assessment:*

Program Learning Outcomes (PLOs) are mapped to specific Course Learning Outcomes (CLOs), ensuring that each course contributes to the overarching educational objectives.

Various assessment methods are implemented to evaluate the achievement of CLOs, which feed into the evaluation of PLOs.

- *Outcome Assessment and Level of Outcome Assessment:*

The effectiveness of the learning outcomes (both PLOs and CLOs) is assessed to determine the level at which students meet these expected outcomes. This step is crucial for identifying areas where the curriculum may need adjustment.

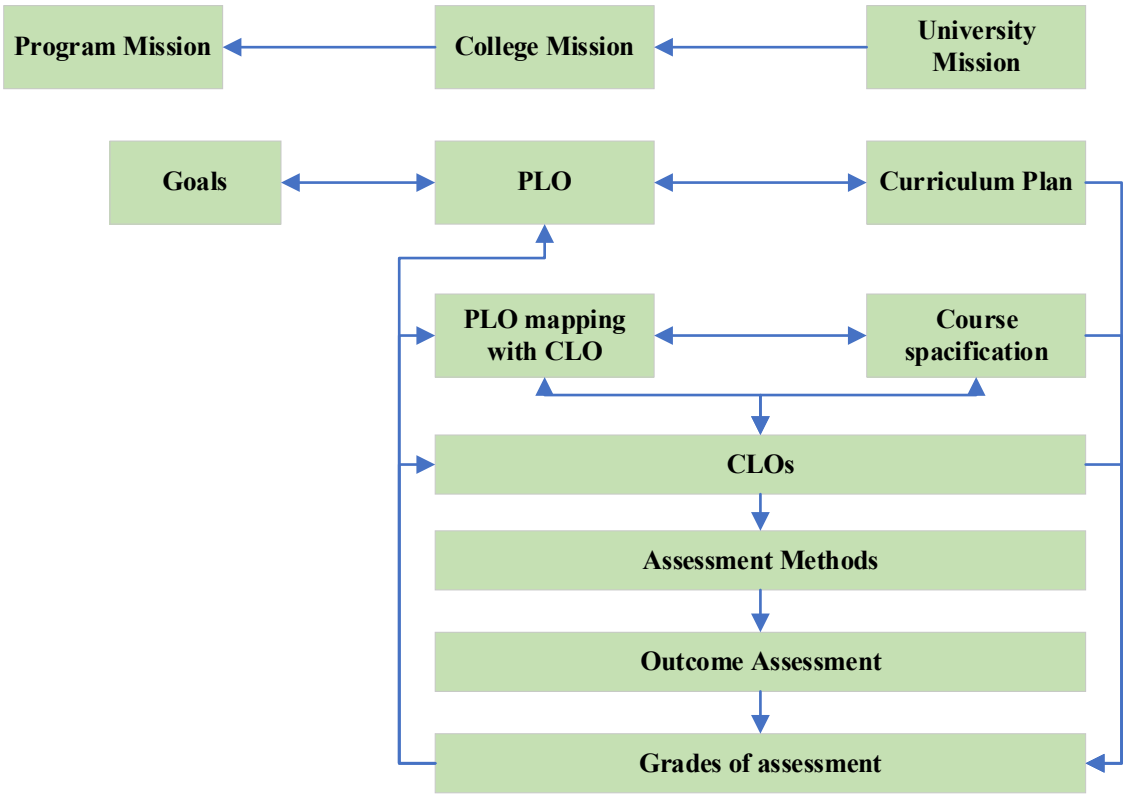

Figure 12 Program and course annual Monitoring and Reporting

- *Program and Course Annual Monitoring and Reporting:*

Annual monitoring and reporting activities involve collecting data on student recruitment, progression, and completion. Feedback from students and external bodies is considered to refine learning and teaching strategies.

The process is reflective, involving a continuous review of course reports and program performance against established Key Performance Indicators (KPIs) or benchmarks. This ongoing evaluation helps ensure the program remains current and aligned with academic standards and industry expectations.

- *Continuous Quality Improvement Cycle:*

The system embodies a continuous quality improvement cycle, where the collection of evidence and analysis of data lead to informed decisions on program enhancements. This cycle ensures that the educational offerings are not only compliant with accreditation standards but are also progressively refined to improve student outcomes and satisfaction.

Table 8 Show how the mission of the College helps to achieve the mission of the University

College Mission	University Mission		
	To provide an academic environment conducive to teaching and learning	To provide an academic environment conducive to scientific research	Social contribution through optimal utilization of our resources.
To achieve academic excellence by providing adequate teaching-learning resources	√	√	
Motivating scientific research		√	
Bring forth qualified engineers to serve the community		√	√

Table 9 Mission of the Electrical Engineering Program helps to achieve the mission of college.

Program Mission	College Mission		
	To achieve academic excellence by providing adequate teaching-learning resources	Motivating scientific research	Bring forth qualified engineers to serve the community
To endow high quality education	√	√	
Prepare electrical engineers who are competent to use modern technology.	√	√	
Carrying out innovative research		√	
Engage in community services			√

Table 10 Consistency of the Program Educational Objectives with Mission of the University

Program Educational Objectives	University Mission		
	To provide an academic environment conducive to teaching and learning	To provide an academic environment conducive to scientific research	Social contribution through optimal utilization of our resources.
Prepare graduates to apply their understanding of science and technology for solving the problems arising in their career path, especially in the field of electrical engineering or related areas and make them capable of functioning effectively in an interdisciplinary environment.	√	√	
Prepare graduates to pursue advanced studies, conduct scientific research and engage	√	√	√

Program Educational Objectives	University Mission		
	To provide an academic environment conducive to teaching and learning	To provide an academic environment conducive to scientific research	Social contribution through optimal utilization of our resources.
in lifelong learning in electrical engineering and allied fields.			
Make the graduates to practice technical standards and communicate their ideas clearly and precisely, both orally and in writing.	√	√	√
Prepare graduates to contribute for the sustainable development of the community through their technical expertise and skills while maintaining professional ethical conduct.	√		√

Table 11 Consistency of the Program Educational Objectives with Mission of the College

Program Educational Objectives	College of Engineering Mission		
	To achieve academic excellence by providing adequate teaching-learning resources	Motivating scientific research	Bring forth qualified engineers to serve the community
Prepare graduates to apply their understanding of science and technology for solving the problems arising in their career path, especially in the field of electrical engineering or related areas and make them capable of functioning effectively in an interdisciplinary environment.	√		√
Prepare graduates to pursue advanced studies, conduct scientific research and engage in lifelong learning in electrical engineering and allied fields.	√	√	√
Make the graduates to practice technical standards and communicate their ideas clearly and precisely, both orally and in writing.	√		√
Prepare graduates to contribute for the sustainable development of the community through their technical	√		√

expertise and skills while maintaining professional ethical conduct.			

5.5 Arrangements for Planning and Reviewing the Quality of the Program

The quality assurance and periodic review of academic programs are critical components in maintaining and enhancing educational excellence. Below is an outline of the structured approach used for planning and reviewing the quality of programs, adhering to NCAAA guidelines:

- Preparation of Program and Course Specifications: Develop program and course specifications following NCAAA standards. These specifications serve as foundational documents that guide periodic program reviews and provide comprehensive information bases for continuous improvement.
- Course Specifications Preparation: Detailed course specifications are crafted to offer clear guidelines for instructors on course topics, teaching strategies, and assessment methods, ensuring consistency and alignment with program objectives.
- Course Reports Preparation: At the end of each semester, course coordinators or instructors prepare course reports. These reports, once reviewed by the department board or the department quality representative, are submitted to the college quality assurance committee.
- Annual Program Report: Utilizing the data from course reports, the college quality assurance committee compiles an annual program report. This report highlights areas of strength and identifies potential weaknesses, setting action plans to address them and enhance overall academic performance.
- Preparation for Program Periodic Review: Additional necessary documents are prepared for the periodic program review. This includes survey reports, graduate attributes report, Key Performance Indicators (KPIs) reports, Program Learning Outcomes (PLOs) measurement reports, reports on mission/vision achievement, updates on curriculum reviews, annual program reports, and other relevant internal or external review reports.

Types of Comprehensive Review

5.5.1. Internal Review

First Stage: All relevant documents are reviewed by faculty members as organized by the quality assurance committee. An annual meeting involving student representatives and faculty members is held to discuss these documents and gather feedback.

Second Stage: The quality assurance committee compiles a comprehensive report detailing strengths, weaknesses, and improvement recommendations. This report is then submitted to the quality and development committee and subsequently to the College Board for further action.

5.5.2. External Review and Independent Opinion

An annual meeting involves the program advisory committee and alumni representatives to discuss program progress and challenges. Additionally, every five years, an external reviewer is invited to evaluate the program, facilities, and resources comprehensively. The findings from these reviews and meetings are periodically used to assess and enhance the college's academic processes and outcomes, guiding strategic improvements and alignment with the college's mission and strategic goals.

5.6 Measurement Policy:

Preparation of all external and internal reports (KPIs, PLOs, External reviewer, Course and program report, etc) This initial step involves gathering and preparing all relevant data and reports that will inform the quality assurance process. This includes both internal metrics like program learning outcomes (PLOs) and key performance indicators (KPIs), as well as external assessments and feedback. Send to the Vice Dean of Academic Affairs and development, Once the reports are prepared, they are forwarded to the Vice Dean of Academic Affairs and Development. This role typically oversees the academic integrity and development initiatives within the institution, ensuring that all programs align with the institution's strategic goals and comply with external standards. Final Program Review Report prepared by the QA committee and sent to Quality and Development Committee

The Quality Assurance (QA) committee reviews the compiled reports and prepares a final program review report. This report assesses the overall performance and quality of the program, highlighting areas of strength and those needing improvement. It is then sent to the Quality and Development Committee for further evaluation. Send to the Dean for approval. After review by the Quality and Development Committee, the report is forwarded to the Dean for final

approval. The Dean's approval is crucial as it authorizes the implementation of recommended actions and acknowledges the program's alignment with the college's academic standards.

Action plan implementation and monitoring by QA committee Post-approval, the QA committee takes charge of implementing the action plans derived from the review process. This stage is critical as it involves actual changes and improvements in the program. The committee also monitors the effectiveness of these implementations, ensuring they yield the desired outcomes. Additional Information on Performance Measurement and Program Evaluation:

- This is a continuous process using predefined metrics to monitor and report the program's achievements.
- Utilizes both measurement and analysis to answer detailed questions about how effectively the program meets its goals, providing insights into the reasons behind the results.

5.6.1. Learning Outcome Assessment

Involves assessing both course and program learning outcomes through direct methods (like course assessments) and indirect methods (such as surveys from exiting students, alumni, and employers).

5.6.2. Stakeholder Surveys

Conducting surveys among all major stakeholders of the program to gather feedback and insights, which are crucial for continuous improvement.

5.6.3. Improvement Plan

An annual improvement plan is developed based on the assessment mechanisms described. This plan considers a strategic five-year plan and integrates specific performance indicators to track the progress and effectiveness of the improvements.

Table 12 improvement plan

Name of Survey	Timeline of Survey	Respondents	Participant
Student's evaluation of the quality of the course	At the end of every semester	Students of all levels	Internal
Students' satisfaction with the offered services	At the beginning of the third semester	Level 7 or 8 Students	

Name of Survey	Timeline of Survey	Respondents	Participant
Students' evaluation of quality of learning experience in the program (Final Level Survey)	At the beginning of the second Semester	Level 10 Students	
Graduate employability and enrolment on post- graduate programs	At the end of the third semester	Level 10 Exit Students	
Employer's evaluation of the program graduate's proficiency	During the first semester	Employers	External
Graduate employability and enrolment on post graduate programs	During the first semester	Alumni	
Self-satisfaction rate of faculty	At the end of the second Semester	Employees	

5.7 Principles & Policy for assessment:

The assessment principles and policy described here underline a comprehensive strategy aimed at ensuring the quality and effectiveness of an educational program through systematic evaluation and feedback mechanisms. This multifaceted approach integrates both direct and indirect methods to assess the attainment of program learning outcomes (PLOs), aiming to foster continuous improvement and alignment with the needs of students and stakeholders. Here's an expanded explanation of the key components involved:

5.7.1. Assessment Principles

Equitable Treatment and Standards Protection: The program is committed to ensuring fair and equitable treatment for all students during evaluations. This is crucial for maintaining the integrity and standard of the awards conferred by the program.

Purpose of Assessment: Assessments are designed not merely to evaluate student learning but to actively enhance it by identifying current levels of understanding, setting clear subsequent learning goals, and aiding students in achieving these goals.

Continuous and Collaborative Assessment: Rather than isolated events, assessments are viewed as ongoing, multifaceted interactions between instructors and students, which are integral to both improving student performance and their ability to learn independently.

Diversity of Assessment Methods: A range of assessment methods is employed, including examinations, assignments, presentations, oral interviews, and digital projects, to comprehensively evaluate different facets of student competencies.

5.7.2. Assessment Policy

Scope and Application: This policy applies across all academic programs and departments, encompassing both undergraduate and graduate courses, and details a systematic process for gathering, analyzing, and utilizing outcome data to enhance student learning practices.

Methodology: The policy distinguishes between the evaluative assessments used for individual courses or faculty and the broader, program-level assessments that focus on overall educational outcomes. Course Assessment Process Using DIOAR Model. The Design → Implement → Observe → Analyze → Revise (DIOAR) model underpins the Teaching and Learning Quality Assurance and Improvement process. This model is instrumental in continually refining academic processes to enhance learning outcomes.

5.7.3. CLO Assessment Types

Variety and Selection: The choice of assessment types often reflects a mix of historical practices, personal preferences, and resource constraints, though ideally, they should be carefully matched with intended learning outcomes to ensure the strategic alignment of assessments.

Fairness and Validity: Decisions regarding assessment methods should prioritize fairness to the candidate, with a strong emphasis on the validity and reliability of the assessments to ensure they accurately measure student achievement against stated outcomes.

5.7.4. Assessment of Program Learning Outcomes (PLOs)

Consistency with NQF: The main PLOs are aligned with the National Qualifications Framework, covering knowledge, skills, and values to ensure that graduates meet prescribed standards.

5.7.5. PLOs Assessment Methods

Direct and Indirect Assessments: Direct methods include detailed rubrics and performance evaluations, while indirect methods encompass feedback from stakeholders such as alumni and employers, contributing to a rounded understanding of program effectiveness.

Use of Feedback for Improvement

Strategic Planning and Improvement: Feedback from these assessments' feeds into strategic planning and the continuous improvement cycle of the program, ensuring that educational offerings remain relevant and effective.

Stakeholder Engagement: Surveys and feedback mechanisms involving students, alumni, and employers are crucial for gauging satisfaction and the practical impact of the program on graduates' careers.

5.8 Mapping of Program learning outcomes (PLOs) VS Graduate attributes Program mission and goals

The mapping of Program Learning Outcomes (PLOs) and Graduate Attributes (GAs), alongside the alignment of program mission and goals, is a systematic approach used in academic programs to ensure the quality of education and the competence of graduates. Here's an elaboration on how this process is structured within the Electrical Engineering program at the College of Engineering, illustrating a generalizable approach that can be adapted to different academic settings:

5.8.1. Alignment of PLOs and GAs

The program clearly defines and aligns its learning outcomes with the desired graduate attributes, ensuring that each attribute is developed through one or more specific learning outcomes This mapping ensures that all necessary skills and competencies (e.g., scholarship of knowledge, problem-solving abilities, ethical practices) are adequately covered throughout the curriculum.

5.8.2. Measurement of Achievement

At the end of each academic year, the program assesses the percentage of achievement for each Program Learning Outcome. This assessment is directly linked to the Graduate Attributes, which are pre-mapped with specific PLOs. Consequently, the percentage achievement of each Graduate Attribute can be derived from this mapping, providing a clear measure of how well the program is instilling the desired attributes in its graduates.

5.8.3. Integration with Program Mission and Goals:

Additionally, all PLOs are mapped with the program's mission to ensure that the overarching goals of the program are being met through the learning outcomes. The achievement of the program's mission is then evaluated based on the aggregate achievement of the Graduate Attributes, ensuring that the mission aligns with practical educational outcomes.

5.9 Measuring Achievement of Program Goals and Objectives Using KPIs

5.9.1. Key Performance Indicators (KPIs):

The program also utilizes Key Performance Indicators (KPIs) as another method of measuring the achievement of program goals and objectives. At the end of the academic year, the achievement of each KPI is measured, with each indicator mapped against specific program goals and objectives. The percentage achievement of these goals and objectives is derived from this KPI mapping.

5.9.2. Comprehensive Assessment:

This dual approach of using both Graduate Attributes and KPIs provides a comprehensive assessment framework that not only measures educational outcomes but also aligns them with professional standards and market needs.

Table 13 Relationship between Goals with the Graduate Attributes

Graduate Attributes	**Goals**				
	Development and innovation of engineering curricula studied to the changing needs in this field.	Configuration of strategic relationship with local and world-wide universities for research partnership and technology transfer.	Encourage and support professional development for staff members and students.	Support education and scientific research by academic services and effective management and technology.	Contributing into the development of the community by preparing and organizing educational programs and trainings in engineering continuously.
GA-1: Scholarship of Knowledge	√				
GA-2: Problem Solving	√				
GA-3: Critical Thinking	√				
GA-4: Usage of Modern Tools		√			

Graduate Attributes	Goals				
	Development and innovation of engineering curricula studied to the changing needs in this field.	Configuration of strategic relationship with local and world-wide universities for research partnership and technology transfer.	Encourage and support professional development for staff members and students.	Support education and scientific research by academic services and effective management and technology.	Contributing into the development of the community by preparing and organizing educational programs and trainings in engineering continuously.
GA-5: Communication			√		
GA-6: Ethical Practices and Social Responsibility					√
GA-7: Independent and Reflective Learning			√		
GA-8: Research Skill/Investigation Skill		√		√	
GA-9: Life-long Learning	√		√		√

5.10 Process of Review of Program Educational Objectives

Program Educational Objectives: The program Educational Objectives are defined with the help of collaboration and meeting with the department and industry constituencies at first level. The review and revision process of the PEOs involves the process as shown in the Figure 2.2.

5.10.1. Main Motive for the PEOs Review Process

The main motive behind the PEOs revision is to ensure the consistency and compliance of the established PEOs with the following:

- Changes in institutional mission and vision
- Changes in Curriculum
- Changes in Accreditation Criteria (ABET SOs)
- Demands or suggestions from program constituencies
- Alignment with Professional Bodies

- Changes in National Standards (National Qualification Framework (NQF) in the Kingdom of Saudi Arabia)

5.10.2. Development of PEOs

The following process is adopted to develop the PEOs of a program

- The PEOs draft is developed by brainstorming involving the program faculty, program administrators, and consultants having experience and expertise in Quality.
- The draft of the PEOs is then circulated among the stakeholders (Students, Alumni, Faculty, and Employers) to obtain their feedback and suggestions. determine their acceptance of the PEOs.
- After receiving the feedback from the stakeholders, the PEOs are revised and presented to the Department Council for their feedback.
- Once the comments of the Department Council are included in the PEOs, a final draft is presented to the EAB.
- The EAB includes representatives of the employers of Engineering graduates, alumni, and the local community. Selected faculty members of the Engineering department are also part of the board. The EAB members discussed the PEOs and finally approved them.
- Approved PEOs are published on various platforms having the program information (website, handbook, digital display boards, play cards, leaflets, etc.

5.10.3. PEOs Revision Process

The review and revision process of the PEOs is planned at the time of key program changes such as curriculum revision, changes in the student outcomes, self-study of the program, etc. It involves consultations with the program's constituencies. From these consultations, the assessment and evaluation committee will propose revisions to the PEOs. The process is as follows:

- Students will be involved in the process in three ways: The current PEOs are published on the department web page and students are encouraged to present proposed revisions through the Engineering student council. Close to the date of each revision, the engineering student council will collect students' opinions about PEO revisions through a questionnaire survey.
- Alumni are involved in the revision process through a survey of randomly selected alumni who graduated within a period of 3 to 5 years. They are sent a questionnaire to

give their opinion on the following: Do they see consistency between the University mission and the PEOs? Do the PEOs reflect their needs? Do they suggest any revisions?

- Employers are also involved in the revision process through a survey of major employers of the program graduates.
- Faculty members are consulted through the surveys about their satisfaction level with the PEO statements and their feedback is taken.
- The proposals will be presented to the faculty at the department council meeting.
- Faculty will play the most important role in revising the PEOs through the department council meetings. The following will be analyzed:
    - Consistency of the revised PEOs with the institutional mission,
    - Consistency of the revised PEOs with the needs of the constituencies,
    - Consistency of the revised PEOs with the student outcomes.
    - Consistency of PEOs with National standards.
    - The revised PEOs will be sent to EAB members for feedback.
- EAB members will present their opinions.
- The department council will consider the recommendations of EAB and will give final approval to the revisions.
- Results of the inputs to the PEOs are documented as part of the university assessment process. The program's Quality coordinator maintains the assessment records.

5.10.4. Assessments Involved in the PEOs Review Process

PEOs Review Process is based on the following assessments or activities usually performed by the Quality and Development Committee (QAD)

- PEOs Assessments
- Alignment with SOs
- Alignment or Mapping of PEOs with the most recent mission and vision statements
- Alignment with Professional bodies, visions, objectives, and strategies of SCE (Saudi Council of Engineers)
- Alignment with National Standards (NQF-KSA Learning Domains and Outcomes)
- Surveys from program constituencies

The process of Revision of PEOs is part of the long-term assessment cycle and is depicted in the Figure 13. Based on the PEO revision process mentioned, the review has been done and the details are mentioned in the upcoming sections

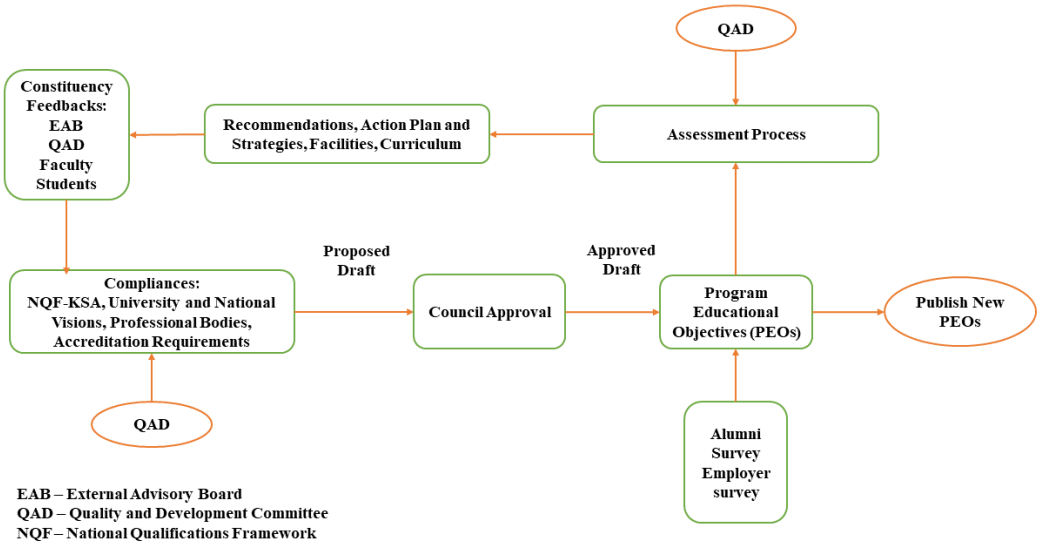

Figure 13 PEOs Review Process.

5.11 Course File Review Process

5.11.1. Course File Preparation

Instructors prepare comprehensive course files, including Course Reports (CR), Course Specifications (CS), Rubric Course Learning Outcome Assessments (CLO), student grades, and statistical analyses. These files also incorporate academic performance data tracked over the semester.

5.11.2. Initial Quality Committee Review

The department's Quality Committees review these files to ensure all materials meet the set educational standards. This review is crucial for identifying areas needing adjustment or enhancement before further evaluations.

5.11.3. Peer Review

The files are then subjected to a peer review by QA representatives from other departments. This external review helps to maintain objectivity and ensures that the courses meet institution-wide quality standards.

5.11.4. Departmental Discussion

The outcomes of the reviews, along with any recommended action plans, are discussed within the departmental board. This discussion aims to consolidate feedback and formalize plans for any necessary changes.

5.11.5. Action Plan Development and Approval

Action plans developed from the reviews are finalized and need approval from higher administrative levels, typically involving the Vice Dean of Educational Services and Development and, subsequently, the College Board.

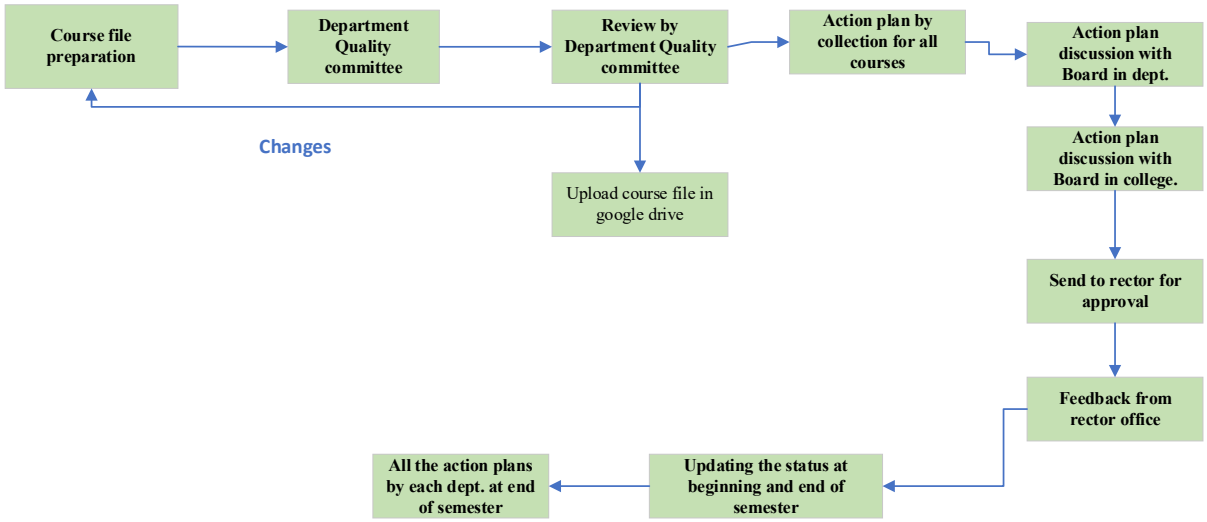

Figure 14 course files review and approval process

5.11.6. Implementation and Monitoring

Approved action plans are implemented, and their effectiveness is monitored by the Quality Assurance Committee. This is an ongoing process, ensuring that adjustments lead to tangible improvements in course delivery and content.

5.11.7. Feedback and Reporting

Feedback on the implemented changes is compiled and reported back to the department for further action, ensuring a continuous loop of improvement.

5.12 Integration with Broader Academic Quality Assurance

This process is part of a larger academic quality assurance framework that includes reviewing program learning outcomes (PLOs) and aligning them with the university, college, and program missions and goals. The review process for PLOs involves:

- Assessing and updating PLOs based on changes in educational standards, including updates from educational and training evaluation commissions and consistency checks with the National Qualifications Framework (NQF).
- Benchmarking PLOs against similar accredited programs to ensure competitive and current educational offerings.

- Mapping PLOs to teaching activities and assessments to ensure that educational experiences are aligned with intended outcomes.
- Gathering and analyzing direct and indirect assessment data to continually refine and enhance the educational experience.

5.13 Graduate Attributes Review Mechanism

The review of graduate attributes includes revising them based on updated program learning outcomes, institutional missions, and external benchmarks. Stakeholder input, including feedback from advisory boards and academic councils, plays a crucial role in this process. Once revised, these attributes are approved by relevant educational authorities and communicated to all stakeholders, ensuring that graduates of the program are well-equipped to meet professional and academic challenges. This thorough and systematic approach to course and program review ensures that the educational offerings not only meet the current standards but are also progressively enhanced to adapt to new challenges and expectations.

Chapter 6 NCAAA steps and Requirements

6.1 NCAAA Overview

In December 2022 (1443H), the National Commission for Academic Accreditation and Assessment (NCAAA) outlined five standards for program accreditation critical to the Electrical Engineering Department:

- Program Management and Quality Assurance
- Teaching and Learning
- Students
- Faculty
- Learning Resources, Facilities, and Equipment

These standards collectively ensure the continuous development and enhancement of the program, focusing on integrity, transparency, and effectiveness within an educational framework.

6.1.1. Standard 1

Effective leadership is crucial for the success of the Electrical Engineering program. The leadership must enforce and abide by institutional systems, policies, and regulations, ensuring that a robust quality assurance system is in place. This system should foster continuous development and uphold a culture of integrity, transparency, and fairness within a supportive organizational environment.

6.1.2. Standard 2

The program must clearly define its graduate attributes and learning outcomes, ensuring alignment with the Saudi Arabia Qualifications Framework (SAQF) and relevant academic and professional standards. This alignment must also consider the demands of the labor market. The curriculum should meet professional standards, and teaching staff are expected to utilize diverse and effective educational strategies and assessment methods tailored to various learning outcomes. The effectiveness of these learning outcomes must be continuously evaluated and used as a basis for program improvement.

6.1.3. Standard 3

Student admission criteria should be transparent, just, and publicly accessible. Information about the program and graduation requirements must be readily available to ensure students are fully informed of their rights and responsibilities. The program should provide effective academic guidance, counseling services, and a range of extracurricular activities, all aimed at

enhancing student life and learning. Additionally, the program must continuously assess and improve the quality of services and activities offered to students.

6.1.4. Standard 4

Faculty: The Electrical Engineering program requires a team of highly qualified and capable teaching staff who possess the necessary expertise to fulfill their academic roles effectively. It is imperative that faculty members stay updated with the latest academic and professional trends within their specialties. They are also expected to actively engage in research activities, community service, and contribute to the ongoing enhancement of both the program and the broader institutional objectives. Regular performance evaluations should be conducted for all teaching staff, using established criteria to ensure continual professional development and program enrichment.

6.1.5. Standard 5

The program must ensure that all learning resources, including facilities and equipment, are sufficiently comprehensive to support the educational objectives of the courses offered. These resources should be readily accessible to all stakeholders, including faculty and students, ensuring that everyone can benefit from and effectively utilize them. Faculty and students should be actively involved in the selection and evaluation of these resources, helping to identify needs and evaluate the suitability and effectiveness of the learning aids provided. This collaborative approach ensures that the resources are not only available but are also aligned with the evolving needs of the educational programs.

6.2 NCAAA Evaluation Scale of the Standards and Criteria

The process of enhancing and ensuring the quality of educational programs relies heavily on the self-evaluation conducted by the program and its associated units. This self-evaluation utilizes established quality performance criteria. Faculty and staff responsible for various program aspects assess performance levels based on these criteria, supported by concrete evidence, performance indicators, and comparisons with other high-quality programs, particularly in critical areas. This internal review is bolstered by independent evaluations from external experts to ensure the objectivity, credibility, and precision of the assessments.

6.2.1. Program Self-Evaluation Scale (SESp)

To maximize the precision of evaluations, the NCAAA has articulated specific components that these assessments rely upon for each criterion under the standards. Evaluations are judged based on how well the criterion's elements are met and the effectiveness with which they

facilitate the quality loop (planning, implementation, review, and improvement). Evaluations also consider the uniqueness of the criterion and whether the program demonstrates any notable excellence or innovation in its execution, aligning with the advancements achieved by leading higher education programs globally. The evaluation criteria include:

Extent of availability of elements and components of the criterion.

- Quality level of application for each element.
- Regularity of application and assessment, and the availability of supporting evidence.
- Continuous improvement and the effectiveness of results based on performance indicators and benchmarks.
- Excellence and creativity in implementing the elements of the criterion.
- Assessments are grounded in evidence and quality indicators rather than unsupported impressions.

6.2.2. Steps for Evaluation

Evaluation begins at the criterion level and progresses to encompass the standard as a whole, ensuring a comprehensive review of performance.

6.2.3. Description of Performance Level

The evaluation process begins by establishing whether a criterion is applicable to the program are Applicable and Not applicable. Applicable - If relevant, the criterion is crucial and assessed using a scale from 1 to 4, and Not Applicable -If the criterion is irrelevant to the program's nature or activities, it is excluded from the standard's evaluation.

- ***Definitions of performance quality are:***

Level 1 (Non-Compliance): No elements of the criterion are present, or their application is minimal and inadequate.

Level 2 (Partial Compliance): Elements are mostly present but are applied inconsistently, with sporadic assessment and minimal evidence, indicating limited improvement actions.

Level 3 (Compliance): All criterion elements are available and applied consistently and effectively, with regular assessments, adequate evidence, and continuous, effective improvements.

Level 4 (Perfect Compliance): All elements are applied in an exemplary manner, with frequent, top-quality assessments, extensive and detailed evidence, ongoing enhancements, superior outcomes relative to comparable programs, and innovative practices evident.

Level 5 (Distinctive Compliance):

6.2.4. Quality Rating/Level of Standard

To determine the quality rating or level of a standard, the evaluation process considers the standard in its entirety. This involves assessing each criterion related to the standard's quality and assigning points based on their individual quality levels. Once all criteria have been evaluated, their points are totaled. The average score is obtained by dividing this total by the number of applicable criteria. This method ensures a comprehensive evaluation of the standard, accounting for various aspects of its quality and providing a standardized way to gauge its overall performance.

Quality rating/Level of Standard		
Level	**Overall rating**	**Average**
Perfect Compliance	Four Points	From 3.5 to < 4.5
Compliance	Three Points	From 2.5 to < 3.5
Partial Compliance	Two Points	From 1.5 to < 2.5
Non-compliance	One Point	< 1.5

6.3 Program Self-Study Report (SSRp)

A Program Self-Study Report (SSRp) serves as a comprehensive evaluation of a program's quality, focusing on the fulfillment of its mission and objectives against established standards of quality assurance and accreditation, such as those set by the NCAAA. The SSRp should function as a detailed investigative report, providing ample evidence and analyses to assure readers of its conclusions' validity, even if they are not familiar with the program. The report should stand alone as a complete, self-contained document that clearly presents the program’s quality.

6.3.1. Program Self-Study Team

A dedicated team of faculty members, under the guidance of the Vice Dean for Education Development (VD-ED), undertakes the self-study according to specific standards. The team’s responsibilities include:

- Drafting Evidence: Preparing an initial list of evidence for specific standards.
- Consultation: Engaging with the VD-ED, Quality Assurance Committee (QAC), and Quality & Development (Q&D) to refine the evidence list.
- Finalization of Evidence: Collaborating with relevant committees or individuals to finalize the evidence list.
- Evidence Collection and Evaluation: Gathering and assessing practices on a scale from 0 to 5, following NCAAA guidelines.
- Analysis and Reporting: Identifying strengths, areas for improvement, and immediate priorities. Assisting the KPI in-charge in analyzing KPIs related to specific standards.
- Documentation: Writing the SSRp and preparing cover letters for SES sub-standards, uploading evidence to DAD/NCAAA systems as directed by the Quality Assurance Unit (QAU) head.

6.3.2. Procedure for Completing SES Tasks

- Step 1: Create a draft list of evidence required for the specific SES standards.
- Step 2: Consult with VD-ED, QAC, and Q&D to finalize the evidence list.
- Step 3: Meet with responsible committees or individuals to finalize the evidence list.
- Step 4: Collect and evaluate evidence based on a 0-5 scale per NCAAA guidelines.
- Step 5: Identify evidence needed for KPIs related to specific SES standards and assist KPI in-charge in analysis.
- Step 6: Identify strengths, areas needing improvement, and priorities for immediate action; write a detailed report.
- Step 7: Prepare an improvement plan in consultation with responsible committees and higher authorities, if necessary.
- Step 8: Write the SSRp for a specific standard based on the NCAAA SSRp template.

This structured approach ensures a systematic and thorough review process, promoting continual improvement and alignment with accreditation standards.

6.4 Program Eligibility Criteria

Program eligibility criteria are shown in Table 13 below:

Table 14 Eligibility Requirements for Program Accreditation

Eligibility Requirements		Required Evidence
1	Program final licensing or establishment decision	• Decision to establish the program (for public institutions) • Final program licensing decision (for private institutions)
2	Consistency with Saudi Arabia qualifications framework (SAQF)	A report on program consistency with the Saudi Arabia Qualification framework (SAQF)
3	Availability of the institutional accreditation requirements	Accredited institution or the institution met the eligibility requirements (review visit has been scheduled)
4	Student and staff manuals	Student and staff manuals including: • Program Handbook • Admission and Registration • Study Regulations and Tests • Guidance and Counselling Services • Rights and Duties • Complaints and Grievances
5	Program's quality assurance system and its performance reports	Program's quality system manual. • A manual of policies and procedures for approving, modifying, and reviewing academic programs and courses. • Annual program report for the last two years according to NCAAA Templates. • Program's course reports for the last two years (One report for each course per year). • A report on the results of stakeholders' surveys (students, alumni, employers, teaching staff, employees) for the last two years.
6	Program and courses specifications	Program specifications according to NCAAA Templates Course specifications for all courses classified according to levels
7	Program learning outcomes assessment plan and reports	• Program learning outcome assessment Plan • Program learning outcome assessment reports

Eligibility Requirements		Required Evidence
8	Students graduated (One cohort at least)	A report on the number of graduated cohorts and the number of students in each cohort
9	Program advisory committee	Composition and functions of the Committee. Report on the Committee's performance and outcomes.
10	Key performance indicators and Benchmarking	A report on program's key performance indicators' measurement and benchmarking for the last three years
11	Program self-study	Program self-evaluation scales (taking into consideration that the level of evaluation is not less than three points for each of the main criteria identified by the Centre and for each standard). Program self-study report Evidence for the self-study reports.
Additional requirements for Postgraduate Programs		
12	Operational plan for Scientific research and its follow-up	Operational Plan for scientific research in the program (depending on the nature of the program) • System for monitoring and documenting the scientific research activities of the program. • Periodic performance reports of the scientific research plan
13	Scientific supervision system on theses, projects, or vocational training	Guides, regulations, and procedures for scientific supervision of theses, projects or vocational training Follow-up scientific supervision reports in the program

6.5 Program Accreditation steps

The accreditation process for the program is rigorous, involving multiple steps to ensure compliance with NCAAA standards, from preliminary self-study to final external evaluation and approval.

Table 15 Program Accreditation steps

Step	Criterion
Step 1	The Standing Committee for Academic Accreditation, based on a detailed report by the Quality Assurance Committee (Deanship of Academic Development), identifies the most

	advanced academic programs to obtain program accreditation based on the main evaluation and accreditation plan
Step 2	The Dean of the College shall direct the Program Committee for Evaluation and Accreditation to prepare the self-study in accordance with the standards of the local or international accreditation body.
Step 3	The Program Committee for Evaluation and Accreditation shall submit the eligibility documents and supporting documents through the Head of Department to the College Committee for Accreditation for review
Step 4	After the review, the Dean of the College shall submit the eligibility documents and supporting documents of the Quality Assurance Committee (Deanship of Academic Development) for review within one month to ensure that they comply with the standards of the accreditation body.
Step 5	The Quality Assurance Committee sends a report of the evaluation and the result of the review to the Dean of the College and a copy to the Standing Committee of the Academic Accreditation Committee
Step 6	If all requirements are completed, a team assigned by the Quality Assurance Committee shall make an initial visit to verify all requirements and submit a final report to the Standing Committee of the Academic Accreditation Committee to decide on sending the documents to an external auditor for independent opinion.
Step 7	Communicate with the accreditation body and sign the accreditation contract.
Step 8	The Program Committee shall provide and process all documents required for accreditation in accordance with the requirements of the accreditation body, and then send to the accreditation body to meet the requirements of its schedule.
Step 9	In cooperation between the dean of the college and the quality assurance committee, the visit of the accreditation team is planned and arrangements are coordinated.
Step 10	The accreditation team site visits will be conducted, the report and results are presented at a meeting attended by the Vice President for Development and Entrepreneurship, the Dean of the College concerned, the Dean of Academic Development, the members of the Quality Assurance and Program Committee.

6.6 Program Key Performance Indicators (KPIs)

The department tracks specific KPIs to monitor and improve the program's effectiveness, including graduate employability, student satisfaction, and faculty research output.

Standard	KPIs Code	KPIs
	KPI-P-01	Students' Evaluation of Quality of learning experience in the Program
	KPI-P-02	Students' evaluation of the quality of the courses
	KPI-P-03	Completion Rate
	KPI-P-04	First year: Retention Rate
	KPI-P-05	Students' performance in the professional and/or national examinations
	KPI-P-06	Graduates' employability and enrolment in postgraduate programs
	KPI-P-07	Employers' evaluation of the program graduate's proficiency Teaching Staff
Standard 4. Faculty	**KPI-P-08**	Ratio of students to teaching staff
	KPI-P-09	Percentage of publications of faculty members:
	KPI-P-10	Rate of published research per faculty member
	KPI-P-11	Citations rate in refereed journals per faculty member

6.7 Benchmarking

Benchmarking is an essential strategy for setting standards and defining requirements by comparing one's organizational strategies, products, and processes with those regarded as best-in-class. This continuous process involves measuring the success of your programs against those at peer universities or institutions to identify performance gaps and improve outcomes. The aim is to learn from others who have achieved excellence and then strive to meet or exceed that standard.

Target and internal benchmarks have been established based on a thorough analysis to enhance performance where needed. KPIs are evaluated using statistical tools under a consistent KPI-driven approach. The College of Engineering follows the university's guidelines for selecting internal and external benchmarks and appropriate partners. For internal benchmarking, data from the last two years are utilized to assess the program's trends, improvements, and challenges.

6.7.1. Benefits of Benchmarking

Organizations that have successfully implemented benchmarking programs have realized several key benefits:

- Continuous Improvement Culture: Encourages an environment where continuous improvement is valued, aiming for excellence.
- Enhanced Comparison and Collaboration: Fosters a setting of ongoing comparison, competition, and cooperation among staff and departments.
- Identification of Performance Gaps: Helps in recognizing areas that require improvement and prioritizing these needs.
- Innovation and Standardization: Aids in developing new ideas and standardized methods for accomplishing tasks more effectively.
- Ongoing Quality Enhancement: Promotes a perpetual cycle of quality improvement across all facets of the organization.

6.7.2. Basic Benchmarking Methodology

Plan:

Identify What to Benchmark: Focus on critical processes and collect internal data to gauge performance, understanding the strengths and weaknesses of current practices. Select Benchmarking Partners, Choose internal units for internal benchmarking and external bodies such as other colleges, universities, or industry leaders for a broader perspective.

Implement:

Data Collection: Engage in gathering both qualitative and quantitative comparative data through various means such as surveys, site visits, and interviews.

Analyze:

Data Evaluation: Analyze the collected data to identify performance gaps and consider new strategies or practices that could be adopted.

Act:

Implement Improvements: Develop and execute an action plan for change, assessing the effectiveness of these changes through measured results.

6.8 Quality Improvement Initiatives

The Quality Assurance Committee at the College of Engineering undertakes various initiatives to promote and enhance quality across the college:

- Promoting Quality Culture, Spreads awareness of the importance of quality and improvement among faculty and students.
- Supporting College Objectives, actively contributes to achieving all college goals related to quality and accreditation.
- KPI Development and Refinement, Works collaboratively across teams to develop and refine key performance indicators.
- Quality Reviews and Consultations, evaluates performance periodically and provides consultation on quality enhancement strategies.
- Quality Manual Compilation, Manages the compilation of manuals for quality assurance and outcomes assessment, ensuring all activities meet high standards.

References:

1. NCAAA Standards for Program and Institution.
2. SES for Program and Institution.
3. SSRp Template of NCAAA.
4. King Khalid University QMS handbook.
5. NCAAA website.
6. NCAAA Handbook-for-Quality-Assurance.
7. National-Qualifications-Framework-for-higher-education in Saudi Arabia.
8. SAQF Framework Registration Standards.