PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

VISION AND MISSION STATEMENTS OF DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Vision: To be a global leader in Electrical and Computer Engineering education and innovation, producing skilled engineers who drive sustainable development and transform society through cutting-edge technology.

Mission: To deliver world-class education and research in Electrical and Computer Engineering, equipping graduates with creativity, technical expertise, and ethical values to address societal and industrial challenges.

Description of the Programme Educational Objectives (PEOs)

The Program Educational Objectives (PEOs) for the Electrical and Electronics Engineering programme of Kwara State University have been formulated to reflect the vision of Kwara State University, which seeks to be the foremost institution in expanding the frontiers of knowledge and innovation, as well as its mission to build a knowledge-driven society by fostering creativity and leveraging cutting-edge technology. This was done by considering inputs from key stakeholders, including industry partners, alumni, students, staff, and employers, to address the needs of the engineering profession and societal challenges. The formulated PEOs are specific, measurable, achievable, realistic, time frame (SMART).

Within 3–5 years after graduation, the graduates of the Electrical and Electronics Engineering (EEE) Programme of Kwara State University are expected to:

PEO 1: Professional Competence

Demonstrate proficiency in the application of electrical and electronics engineering principles, tools, and techniques to solve practical and complex problems in diverse industries such as energy, telecommunications, automation, and electronics, contributing effectively to local and global engineering challenges.

PEO 2: Entrepreneurship and Innovation

Establish themselves as successful professionals or entrepreneurs by developing innovative solutions and leveraging their technical expertise and business acumen to create opportunities for self-employment and employment in the public and private sectors.

PEO 3: Lifelong Learning and Skill Development

Engage in lifelong learning and continuous professional development through advanced studies, certifications, participation in workshops, and active membership in engineering organizations like COREN, NSE, and IEEE to remain competitive in a rapidly evolving technological landscape.

PEO 4: Ethical and Social Responsibility

Exhibit high ethical standards, professionalism, and social responsibility in their professional practices, contributing positively to societal development and addressing sustainable development goals (SDGs) within the context of engineering.

PEO 5: Leadership and Teamwork

Effectively lead or contribute as team members in multidisciplinary engineering projects by demonstrating strong leadership, communication, and collaboration skills to deliver impactful outcomes while meeting the needs of employers, stakeholders, and the community.

Programme Educational Objectives (PEOs)

PEO	Attribute	Description
PEO1	**Professional Competence**	Demonstrate proficiency in the application of electrical and electronics engineering principles, tools, and techniques to solve practical and complex problems in diverse industries such as energy, telecommunications, automation, and electronics, contributing effectively to local and global engineering challenges.
PEO2	**Entrepreneurship and Innovation**	Establish themselves as successful professionals or entrepreneurs by developing innovative solutions and leveraging their technical expertise and business acumen to create opportunities for self-employment and employment in the public and private sectors.
PEO3	**Lifelong Learning and Skill Development**	Engage in lifelong learning and continuous professional development through advanced studies, certifications, participation in workshops, and active membership in engineering organizations like COREN, NSE, and IEEE to remain competitive in a rapidly evolving technological landscape.
PEO4	**Ethical and Social Responsibility**	Exhibit high ethical standards, professionalism, and social responsibility in their professional practices, contributing positively to societal development and addressing sustainable development goals (SDGs) within the context of engineering.

PEO5	**Leadership and Teamwork**	Effectively lead or contribute as team members in multidisciplinary engineering projects by demonstrating strong leadership, communication, and collaboration skills to deliver impactful outcomes while meeting the needs of employers, stakeholders, and the community.

PEOs Consistency with the Vision and Mission of the Department and Stakeholders' Requirements

The PEOs are directly aligned with the vision and mission of Kwara State University, the Faculty of Engineering and Technology (FET), and the Department of Electrical and Computer Engineering (ECE). They are tailored to meet the requirements of stakeholders while preparing graduates to excel as competent, innovative, ethical, and socially responsible engineers. This consistency ensures the programme contributes meaningfully to the university's overarching goals and societal development. The following tables illustrate the alignment of the Programme Educational Objectives (PEOs) with the vision and mission of Kwara State University, the Faculty of Engineering and Technology, and the department and the stakeholders' requirements.

Alignment of PEOs with the Vision and Mission of the Department of Electrical and Computer Engineering (ECE)

PEO	**PEO Description**	**ECE Vision:** ***"To be a leader in producing innovative and skilled electrical and computer engineers equipped to solve global challenges."***	**ECE Mission:** ***"To develop competent, innovative, and ethical engineers through cutting-edge education, research, and entrepreneurship to drive sustainable development."***
PEO 1: Professional Competence	Demonstrate proficiency in applying electrical and electronics engineering principles to solve complex problems.	Promotes innovative and skilled engineers by equipping graduates with advanced technical knowledge and problem-solving abilities for global challenges.	Provides cutting-edge education that prepares graduates to address industry-specific and societal challenges with technical proficiency.
PEO 2: Entrepreneurship and Innovation	Develop innovative solutions and entrepreneurial ventures in engineering fields.	Encourages leadership in innovation by fostering a culture of entrepreneurship and self-reliance in engineering practices.	Emphasizes entrepreneurship by training graduates to create innovative solutions and opportunities for sustainable development.

PEO 3: Lifelong Learning and Skill Development	Engage in continuous professional development to remain competitive in a dynamic world.	Supports the vision of producing skilled engineers who remain adaptable and relevant in a rapidly evolving technological landscape.	Encourages participation in lifelong learning opportunities such as advanced studies, certifications, and professional development initiatives to remain competent and innovative.
PEO 4: Ethical and Social Responsibility	Exhibit professionalism and address societal challenges with ethical engineering practices.	Aligns with producing engineers who can tackle global challenges while considering societal, environmental, and ethical factors.	Promotes ethical practices by instilling social responsibility and ensuring graduates contribute positively to sustainable development goals (SDGs).
PEO 5: Leadership and Teamwork	Effectively lead or contribute to multidisciplinary engineering teams.	Fosters leadership and teamwork as key attributes for solving complex engineering challenges in global contexts.	Builds collaboration and leadership skills essential for multidisciplinary projects, ensuring graduates can drive innovative and sustainable solutions for societal and industrial needs.

Alignment of PEOs with Stakeholders' Requirements

PEO	**Stakeholder**	**Stakeholder Requirements**	**How PEO Meets the Requirements**
PEO 1: Professional Competence	Industry Partners	Engineers with strong technical knowledge and practical problem-solving skills.	Ensures graduates have proficiency in advanced engineering principles and tools to meet industry standards.
PEO 2: Entrepreneurship and Innovation	Students and Alumni	Graduates equipped with entrepreneurial and innovative thinking.	Equips students with entrepreneurial skills to create opportunities for self-employment and technological solutions.
PEO 3: Lifelong Learning and Skill Development	Employers and Professional Bodies	Engineers who pursue continuous learning and certifications.	Encourages active participation in professional bodies like COREN, NSE, and IEEE, ensuring relevance in the industry.
PEO 4: Ethical and Social Responsibility	Society and Government	Engineers who uphold ethical standards and address societal issues.	Produces socially responsible engineers who contribute to sustainability and align with SDG goals.
PEO 5: Leadership and Teamwork	Employers and Industry Partners	Engineers capable of teamwork and leadership.	Builds leadership and collaboration skills for multidisciplinary team projects and impactful engineering contributions.

Processes for Evaluating the Achievement of Program Educational Objectives (PEOs)

The Processes used to evaluate the achievement of PEOs involve systematic and cyclical evaluation that ensures that the Electrical and Electronics Engineering programme continues to meet its objectives and adapt to the dynamic needs of engineering education and practice. The process is described in the table below.

Processes for Evaluating the Achievement of PEOs

Evaluation Process	Description	Frequency	Responsible Stakeholders
Alumni Surveys	Conduct surveys among graduates (5 years post-graduation) to assess how well the PEOs are being achieved in their careers.	Every 5 years	Staff, Alumni Office
Employer Feedback	Gather input from employers regarding the performance, skills, and competencies of graduates in the workplace.	Every 5 years	Staff, Industry Partners, Career Services
Stakeholder Meetings	Host meetings with key stakeholders (staff, alumni, employers, parents, students) to review PEO relevance and alignment with industry trends.	Every 5 years	Departmental Advisory Board, Staff
Graduate Exit Surveys	Collect feedback from graduating students on the relevance of their education to their career goals and alignment with PEOs.	Annually	Staff, Academic Affairs
Accreditation Visits	Utilize accreditation reviews to assess the extent to which the PEOs align with national and international engineering standards.	Every 5 years	Accreditation Team, Staff
Industry Partnership Reviews	Engage with industry partners to validate that PEOs meet the evolving needs of engineering practices and technologies.	Every 5 years	Staff, Industry Partners
Staff Assessment Reports	Use internal assessments, staff reports, and course evaluations to determine if curricular and co-curricular activities align with PEOs.	Annually	Staff, Department Head
Professional Membership Analysis	Monitor the engagement of graduates in professional organizations (e.g., COREN, NSE, IEEE) and their participation in certifications and lifelong learning.	Annually	Staff, Alumni Office

2.5 How the Results Obtained from the Evaluation are Used to Improve the Effectiveness of the Programme

The results obtained from the evaluation of the Programme Educational Objectives (PEOs) are integral to improving the overall effectiveness of the Electrical and Electronics Engineering (EEE) programme. These results are systematically analyzed, and actionable insights are derived to enhance various aspects of the programme.

The insights gained from these evaluations inform decisions made during the program's comprehensive review every five years. The findings are used to assess the relevance and effectiveness of the Programme Objectives (POs), leading to necessary updates and adjustments. Additionally, the results serve as a basis for refining the course curriculum to incorporate emerging trends, technologies, and skill requirements. They also influence teaching methodologies, ensuring that pedagogical approaches remain innovative, effective, and aligned with both academic and professional expectations. This iterative process ensures continuous improvement, maintaining the program's high standards and responsiveness to evolving societal and industrial needs.

The following describes how these results are utilized:

1. Curriculum Review and Revision

Feedback from alumni surveys, employer feedback, and stakeholder meetings often highlights areas where the curriculum may need improvement. For example, if evaluations reveal gaps in emerging technologies such as artificial intelligence, IoT, or renewable energy, new courses are introduced, and existing ones are updated to include these topics. This ensures that the curriculum remains relevant and aligned with current industry standards.

2. Strengthening Industry Collaboration

Evaluation results from employer feedback and industry reviews emphasize the need for practical exposure. To address this, the programme integrates initiatives such as internships, industry-sponsored projects, and guest lectures. Strengthened partnerships with industry stakeholders ensure that students gain hands-on experience and are well-prepared for real-world challenges.

3. Focus on Soft Skills Development

If evaluations identify deficiencies in communication, teamwork, or leadership skills among graduates, the programme responds by incorporating soft skills training into the curriculum. This may involve technical writing workshops, leadership seminars, or group projects designed to build these competencies.

4. Enhancing Facilities and Resources

Accreditation feedback or staff assessment reports may point out inadequacies in facilities or teaching resources. In response, the department upgrades laboratories, procures modern equipment, and provides training for staff on emerging technologies and teaching methodologies. This creates an environment conducive to effective learning and innovation.

5. Fostering Entrepreneurship and Innovation

If evaluations show that graduates are not leveraging entrepreneurial opportunities, the programme introduces entrepreneurship courses, mentorship programmes, and workshops. These initiatives are aimed at equipping students with the skills to develop innovative solutions and create employment opportunities for themselves and others

2.6 Processes Used to Evaluate the Level of Achievement of the Programme Educational Objectives (PEOs)

The evaluation of the Programme Educational Objectives (PEOs) involves a systematic process that integrates feedback from various stakeholders and ensures continuous improvement of the Electrical and Electronics Engineering (EEE) programme. The key elements of this process include the following:

2.6.1 Graduate/Alumni Follow-up Survey

The Graduate/Alumni Follow-up Survey serves as a critical tool for assessing the performance and impact of the programme on its graduates. This evaluation leverages the networking strength of the institutional alumni association to gather data systematically. Information collected through this platform is incorporated into the programme's alumni data bank, facilitating continuous tracking and follow-up. The insights gained help in monitoring the professional progress and achievements of graduates, which is essential for aligning the programme’s objectives with evolving industry and societal needs.

2.6.2 Graduate/Alumni – Employer Follow-up Survey

The Graduate/Alumni-Employer Follow-up Survey assesses how effectively the programme has prepared its graduates for industry demands, based on the PEOs and Student Outcomes. This survey gathers comprehensive information, including employment details, employer evaluations, and feedback on graduates' strengths, weaknesses, and challenges. It is specifically designed to provide objective insights into graduates' performance in meeting the programme’s expectations. The results offer valuable input for refining the curriculum and improving alignment with industry requirements.

2.6.3 Advisory Board Review

The Advisory Board Review provides a platform for analyzing feedback obtained through surveys and discussing critical issues related to the programme. Quarterly meetings, conducted either physically or via virtual platforms like Zoom, bring together a diverse group of stakeholders, including industry professionals, alumni, and faculty members. These meetings focus on survey results, curriculum updates, and skills acquisition relevant to various sectors,

such as oil and gas, industrial chemicals, food and beverages, and renewable energy. By addressing these discussions, the programme ensures its graduates remain competitive and equipped with cutting-edge knowledge and skills.

2.6.4 Evaluation Process

The data collected from these tools is analyzed to identify gaps, measure the level of PEO attainment, and assess alignment with stakeholder expectations. The results are shared with the Programme Assessment Committee and relevant stakeholders for informed decision-making and programme enhancement.

Evaluation Processes

Activity	Purpose	Tools	Frequency	Stakeholders Involved
Alumni Surveys	Assess graduates' career progression and PEO alignment	Online/physical surveys	Every 5 years	Alumni
Employer Surveys	Evaluate graduate performance and industry readiness	Online/physical surveys	Every 5 years	Employers
Stakeholder Meetings	Review programme effectiveness and recommend improvements	Meetings	Annually	Staff, alumni, students
Interviews	Gain detailed insights into graduate and employer feedback	Structured interviews	On-demand (as needed)	Alumni, employers

This systematic approach ensures the programme's objectives remain aligned with industry expectations, fostering continuous improvement in curriculum design, teaching methodologies, and graduate outcomes.

Achievement of Programme Educational Objectives (PEOs) by Graduates/Alumni

The Programme Educational Objectives (PEOs) of the department have been successfully demonstrated through the accomplishments of its graduates and alumni in various professional and academic fields. Consistent feedback from surveys, alumni engagement, and employer reviews highlights the programme's effectiveness in equipping graduates with the competencies and skills needed to excel in their careers and contribute meaningfully to society.

A significant number of graduates have advanced to prominent positions in industries such as oil and gas, industrial chemicals, renewable energy, and manufacturing, showcasing their ability to apply theoretical knowledge to practical challenges. Their performance reflects the

PEOs' emphasis on fostering problem-solving abilities, leadership, and technical expertise. Alumni employed in engineering roles have been commended for their innovative thinking, adaptability, and effective communication, attributes explicitly aligned with the programme's objectives.

The alumni network has also revealed the entrepreneurial success of graduates who have ventured into self-employment, establishing start-ups and businesses that address local and global challenges. These achievements underscore the PEOs' focus on producing graduates who are not only employable but also capable of creating employment opportunities and contributing to economic growth.

Employer feedback further attests to the alignment of graduate performance with the PEOs. Employers consistently highlight the graduates' ability to engage in multidisciplinary teamwork, uphold ethical standards, and excel in dynamic and complex environments. Additionally, many alumni have pursued advanced degrees and professional certifications, fulfilling the programme's objective of promoting lifelong learning and professional development.

The continuous evaluation of alumni achievements, through mechanisms such as surveys and industry advisory boards, confirms that the programme effectively prepares graduates to meet the evolving demands of their professions. Areas of improvement identified through this process, such as incorporating cutting-edge technologies and enhancing technical training, have been addressed to further strengthen the programme.

Utilization of Feedback and Results for Continuous Quality Improvement (CQI) of the Programme

At the conclusion of each five-year cycle, feedback and results gathered from the annual surveys are systematically collated, analyzed, and discussed by relevant stakeholders, including faculty, industry partners, and the advisory board. This comprehensive evaluation process ensures that the programme's strengths and areas for improvement are identified with precision.

The analyzed data serves as the foundation for implementing Continuous Quality Improvement (CQI) initiatives, which focus on enhancing the curriculum, refining programme objectives, aligning course outcomes with industry standards, and optimizing teaching and assessment methods. Also, feedback from stakeholder meetings highlights areas where staff

training or recruitment is necessary, improving the teaching and learning experience. This iterative process ensures the programme remains responsive to evolving industry trends, technological advancements, and the diverse needs of students and employers.

By integrating these insights into strategic planning and operational adjustments, the department sustains its commitment to delivering a world-class educational experience while continuously fostering innovation, academic excellence, and professional relevance.

The Extent of Stakeholder Involvement in Programme Evaluation Processes.

Stakeholder involvement in the programme evaluation processes is comprehensive, ensuring meaningful contributions from alumni, employers, industry professionals, and staff. Through the Graduate/Alumni Follow-up Survey, the programme systematically tracks the progress and professional achievements of its graduates. This process leverages the strong networking capabilities of the alumni association to collect relevant data. The information gathered is integrated into the alumni database, facilitating ongoing follow-up and offering insights into how graduates' experiences align with the programme's objectives and industry demands.

The Graduate/Alumni-Employer Follow-up Survey engages employers to assess the effectiveness of the programme in preparing graduates for industry roles. This survey provides critical feedback on employment outcomes, employers' evaluations of graduate performance, and the specific strengths and areas for improvement in their skills and knowledge. The data collected serves as a basis for understanding how well the graduates meet the Programme Educational Objectives (PEOs) and Student Outcomes, providing actionable insights for refining the curriculum and bridging any gaps in industry preparedness.

Through the Advisory Board Review, stakeholders from diverse sectors actively contribute to evaluating and enhancing the programme. Quarterly meetings bring together representatives from industries such as oil and gas, industrial chemicals, renewable energy, and more, along with alumni and faculty members. These discussions address feedback from surveys, curriculum relevance, and emerging trends in engineering disciplines. This collaboration ensures that the programme adapts to advancements in technology and evolving industry expectations.

This multi-faceted approach to stakeholder engagement ensures that the programme remains relevant and effective. By actively involving various stakeholders, the programme achieves a robust mechanism for continuous improvement, keeping its graduates competitive and well-prepared for dynamic professional environments.

Continuous Quality Improvement (CQI) Strategies in Relation to PEOs

The Continuous Quality Improvement (CQI) strategies implemented by the department to enhance Programme Educational Objectives (PEOs) include the following:

1. **External Examiner Reviews:** External examiners utilize an Outcome-Based Education (OBE) appraisal form to assess examination questions and provide detailed reports. This process ensures that the examination content aligns with the intended PEOs and learning outcomes. Detailed procedures for this strategy are outlined on the Departmental Handbook.
2. **Lecture Monitoring:** Continuous monitoring of lecture delivery is conducted to maintain high-quality teaching standards. This initiative focuses on assessing the effectiveness of lecture delivery and ensuring alignment with programme objectives. Further details on this strategy can be found in the handbook.
3. **Curriculum Review:** The curriculum undergoes a comprehensive review every five years to ensure its relevance and alignment with evolving academic and industry standards. The department has successfully implemented two curriculum reviews, and the third review, based on the Core Curriculum and Minimum Academic Standards (CCMAS) has already started being used. This update allows the department to customize 30% of its content to suit specific needs.
4. **Facilities Upgrade:** Continuous upgrades of departmental facilities, including the installation of smart boards and modernization of laboratories, contribute to improving the learning environment. These enhancements directly support the attainment of PEOs by providing students with access to state-of-the-art tools and resources.
5. **Faculty Training and Development:** Faculty members participate in regular training sessions, seminars, and workshops to enhance their teaching and professional skills. These initiatives, ensure that instructors remain up-to-date with current educational practices and industry developments.

By implementing these strategies, the department maintains a dynamic and responsive approach to achieving and sustaining the effectiveness of its PEOs, fostering continuous improvement across all aspects of the programme.

Programme Outcomes (POs)

The Programme Outcomes

The Programme Outcomes (POs) published on the university's website https://kwasu.edu.ng/, departmental students' handbook, course outlines and accreditation documents are listed in the Table.

Programme Outcomes

PO1	Engineering knowledge - Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of developmental and complex engineering problems
PO1.1	Demonstrate ability to identify and apply knowledge and techniques in mathematics, science, and engineering to solve engineering problems.
PO2	Problem Analysis – Identify, formulate, research literature and analyze developmental and complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PO2.1	Demonstrate ability to solve problems by concepts through the integration of mathematics, science and engineering.
PO2.2	Demonstrate skill in identifying vital information from resources in solving problems.
PO2.3	Demonstrate skill and appropriate technique and ingenuity in solving developmental or engineering problems.
PO3	Design/Development of Solutions - Proffer solutions for developmental or complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations
PO3.1	Demonstrate understanding of the impact of engineering decisions and solutions to societal issues.
PO3.2	Demonstrate understanding of solutions to cultural diversity based on our local context in Nigeria.
PO3.3	Demonstrate knowledge of the implications of engineering designs and solutions to the public health and safety of all.
PO4	Investigation - Conduct investigation into developmental or complex problems using research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
PO4.1	Demonstrate ability to appropriately set-up and conduct experiments to understand and extract underlining and fundamental principles.
PO4.2	Demonstrate ability to apply statistical tools in designing and analyzing experiments.

PO4.3	Demonstrate skill in applying the appropriate research method in solving engineering problems.
PO5	Modern Tools Usage - Create, select and apply appropriate techniques, resources and modern engineering and ICT tools, including prediction, modelling and optimization to developmental and complex engineering activities, with an understanding of the limitations.
PO5.1	Demonstrate an understanding of the inherent limitations of software (application) tools, and analytical and numerical techniques.
PO5.2	Demonstrate ability to identify and apply appropriate techniques in investigating and solving problems of engineering relevance.
PO5.3	Demonstrate capability and proficiency in using modern and ICT tools to solve engineering problems.
PO6	The Engineer and Society - Apply reasoning informed by contextual knowledge including Humanities and Social Sciences to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice
PO6.1	Demonstrate awareness of legal implications of professional engineering practice.
PO6.2	Demonstrate understanding of the required contribution of engineers to the society.
PO7	Environment & Sustainability - Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development
PO7.1	Demonstrate an understanding of the impact of engineering solutions on the society and environment.
PO7.2	Demonstrate ability to recognize and evaluate the ethical dilemmas that may arise in the workplace.
PO8	Ethics - Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice, including adherence to the COREN Engineers Code of Conducts.
PO8.1	Demonstrate knowledge and understanding of the COREN Engineers Code of Conduct.
PO8.2	Demonstrate ability to apply professional responsibilities and norms of engineering practice.
PO8.3	Demonstrate understanding and appreciation of diversity.
PO9	Individual & Team Work - Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
PO9.1	Demonstrate knowledge and understanding in completing set goals and plan tasks
PO9.2	Demonstrate understanding in apply, using skills acquired to examine and adopt ideas as a member or team lead
PO9.3	Demonstrate the ability to work with other engineering discipline or multidisciplinary settings

PO10	Communication - Communicate effectively on developmental or complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO10.1	Demonstrate the skills to communicate within the engineering society and outside engineering profession
PO10.2	Demonstrate the ability to make presentations and be able to communicate the society at large
PO10.3	Demonstrate the ability to use appropriate presentation medium for proper communication and receive clear instructions
PO11	Project Management & Finance - Demonstrate knowledge and understanding of engineering, management and financial principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments
PO11.1	Demonstrate the ability to conduct, manager and execute projects in multidisciplinary areas
PO11.2	Demonstrate the ability to work within the budget when executing a project for proper management.
PO11.3	Demonstrate recognition or the skills needed for project management
PO12	Lifelong Learning - Recognize the need for, and have the preparations and ability to engage in independent and lifelong learning in the broadest context of technological and social changes
PO12.1	Demonstrate the ability to learn new technology or techniques that will be used for solving life problems and professional development activities
PO12.2	Demonstrate the ability to apply knowledge acquired from teaching, professional journals and industry publications to improve processes and systems

All the twelve programme outcomes are coded PO1 – PO12 and were mapped to the programme educational objectives coded PEO1 – PEO5.

How the POs relate to PEOs

The relationship between the Programme Outcomes (POs) and the Programme Educational Objectives (PEOs) of the KWASU-EEE Programme is presented in the Table.

Link between the POs and the PEOs

CORENProgramme Outcomes		PEOs as defined by the Programme				
		PEO1	**PEO2**	**PEO3**	**PEO4**	**PEO5**
PO1	Engineering knowledge	P	P	P	P	P
PO2	Problem Analysis		P	P	P	P
PO3	Design /development of solutions	P	P	P	P	P
PO4	Investigation	P	P	P	P	P
PO5	Modern Tool Usage	P	P	P	P	P
PO6	The Engineer and Society	P		P	P	P
PO7	Environment & Sustainability	P		P	P	P
PO8	Ethics	P		P	P	P
PO9	Individual and Team work	P			P	P
PO10	Communication	P	P		P	
PO11	Project Management and Finance	P	P		P	
PO12	Lifelong learning		P		P	

How the POs Encompass and Are Consistent with the COREN 12 POs

The POs defined for the Electrical and Electronics Engineering of Kwara State University are fully consistent with the twelve COREN-specified POs as well as all-encompassing. The programme simply adopted all the twelve POs defined by COREN.

The PO Definition or Elements/Performance Indicators

The Programme Outcomes (POs) are defined in terms of measurable performance indicators that ensure students acquire the necessary competencies for their professional careers. These performance indicators are directly linked to the specific knowledge, skills, and abilities that students are expected to demonstrate by the end of the programme. The assessment of these outcomes is done through both direct and indirect methods, with a strong emphasis on aligning assessments with real-world tasks that professionals in the field will encounter.

Direct methods of assessment focus on evaluating students' knowledge and skills through measurable performance indicators. These include formal assessments such as examinations, quizzes, tests (e.g., Test 1, Test 2), and assignments. These assessments are designed to provide

quantitative data on how well students are meeting the defined POs. For example, an engineering knowledge test can assess a student's understanding of core engineering principles (PO1), while problem-solving assignments can evaluate their ability to analyze and solve engineering problems (PO2). These assessments are structured to evaluate the degree to which students meet the expected outcomes in key areas like design, investigation, communication, ethics, and sustainability.

To ensure that the assessments reflect the tasks students will face in their professional careers, the assessments are designed to simulate real-world engineering challenges. This includes assignments such as research projects, laboratory work, and presentations, which mirror the types of tasks engineers encounter in industry and academia. For example, students may be asked to design a solution to an engineering problem (PO3), conduct investigations using modern tools (PO4), or engage in team-based projects requiring collaboration and communication (PO9). These tasks ensure that students are assessed on their ability to apply theoretical knowledge in practical, real-world scenarios.

In addition to these methods, continuous feedback from faculty members, industry professionals, and external examiners ensures that the assessments remain relevant and aligned with the latest industry practices and expectations. The integration of these direct assessment methods with real-world tasks ensures that graduates are fully prepared to meet the demands of the engineering profession and contribute meaningfully to society.

The performance indicators for each PO are clearly defined, providing students with a transparent understanding of the expectations and the opportunity to track their progress. By employing these direct assessment methods, the programme ensures that students develop the comprehensive skill set necessary to thrive in their engineering careers.

The Processes Used to Establish and Review the POs

The processes used to establish and review the Programme Outcomes (POs) are integral to ensuring that the educational objectives align with industry expectations and the evolving needs of the profession. These processes are designed to collect valuable feedback from key stakeholders and to continuously improve the quality of the programme. The involvement of stakeholders, the use of appropriate tools, and the regularity of activities all contribute to the overall success of these processes.

1. **Employer Feedback Survey:** This tool is used to gather input from employers who hire graduates of the programme. The survey aims to assess how well the programme prepares students for the workforce and whether they possess the skills and knowledge required by industry. The feedback from employers is instrumental in identifying areas of improvement for the POs and making necessary adjustments to the curriculum. The survey will be administered annually, with a target for 50% of responses to score 3 or above on a scale of 1 to 5. This ensures that employers' evaluations reflect the adequacy of the programme's outcomes in meeting industry standards.
2. **Alumni Feedback Survey:** The Alumni Feedback Survey is designed to assess the long-term effectiveness of the programme in terms of graduate success and professional development. It will collect information on alumni career progress, their application of knowledge gained during their studies, and their views on the alignment of the programme's outcomes with their career demands. This survey will be administered annually to track the performance of graduates over time. Similar to the Employer Feedback Survey, a threshold of 50% of alumni responses scoring 3 or above will be targeted.
3. **Employment Statistics:** Employment statistics will be collected regularly to evaluate the programme's success in preparing graduates for employment or higher education. A key indicator is that 50% of graduates must be employed or pursuing higher studies within a set timeframe after graduation. These statistics will be gathered from alumni surveys and direct communication with the graduates.
4. **Industry Advisory Board:** The Industry Advisory Board (IAB) plays a critical role in reviewing the POs, ensuring they reflect current trends and future needs in the engineering field. The IAB consists of industry professionals, including alumni, who provide feedback on the relevancy and effectiveness of the POs. Quarterly meetings, held either in-person or virtually, will serve as a platform for discussing survey results, curriculum updates, and industry needs. The IAB ensures that the programme remains aligned with industry expectations and contributes to the continuous improvement of the POs.

Feedback Mechanism and PO Review: A constructive feedback mechanism will be established to accumulate insights from various programme stakeholders, including students, faculty, employers, alumni, and industry professionals. This mechanism will

allow for a holistic review of the programme's POs, ensuring that all relevant perspectives are considered in the assessment process. The PO review will be conducted periodically, with the main assessment occurring at the end of the four-year cycle. Feedback gathered from surveys, meetings, and statistics will be analyzed to identify any gaps between the programme's outcomes and the expectations of the stakeholders. These reviews will inform the ongoing improvement of the programme's objectives, curriculum, and delivery methods.

The regular use of these tools—employer and alumni feedback surveys, employment statistics, and the input from the Industry Advisory Board—ensures that the programme is consistently reviewed and enhanced. By involving various stakeholders in the process, the programme remains dynamic, responsive, and aligned with industry needs, ultimately contributing to the successful preparation of graduates for professional practice.

Mapping of Courses with POs

The mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs) is a fundamental process designed to ensure that the curriculum effectively supports the achievement of the POs. This mapping directly links specific CLOs to the relevant POs, ensuring that each course contributes meaningfully to the overall educational objectives of the programme.

Each course in the curriculum is mapped to one or more POs, and the attainment of these POs is assessed through the achievement of the associated CLOs. To ensure that the programme outcomes are consistently met, at least 50% of the mapped courses must successfully attain their corresponding POs. This is validated by assessing the performance of students in each course, with a minimum of 60% of students or responses needing to score 3 or above on a scale of 1 to 5. This performance threshold ensures that the majority of students are meeting the required standards for the specific POs tied to their courses.

The mapping process is embedded within the course compact for each course, which clearly outlines how the CLOs correspond to the POs. This compact serves as a guide for both instructors and students, ensuring that there is a shared understanding of how each course contributes to the attainment of the POs. By aligning the CLOs with the POs, the curriculum is designed to provide students with the knowledge and skills necessary to achieve the programme's educational objectives and become competent professionals in their field.

How the Assessment Results Are Applied to Further Develop and Improve the POs.

The results derived from the assessments play a crucial role in the continuous improvement of the Programme Outcomes (POs) and the overall quality of the educational experience. The data collected from student performance, including evaluations of knowledge, skills, and competencies, is used to make informed decisions aimed at enhancing various aspects of the programme. Specifically, the assessment results contribute to improvements in the following areas:

1. **Curriculum Development**: The assessment results are analyzed to identify any gaps or areas where students may not be achieving the desired POs. This feedback informs curriculum updates, ensuring that it remains relevant and aligned with both academic and industry standards. By reviewing the performance trends, the programme can adapt the curriculum to better address emerging technologies, industry needs, and academic advancements.

2. **Lecture Delivery Methods**: The effectiveness of teaching methods is directly influenced by assessment results. If students consistently struggle in certain areas or show a lack of engagement, adjustments can be made to teaching strategies. These adjustments might include incorporating more interactive elements, hands-on learning experiences, or leveraging technology to enhance understanding. Continuous monitoring of assessment outcomes allows for more tailored and effective teaching approaches that cater to diverse learning styles and improve student comprehension and retention.

3. **Level of Student Participation**: Engagement in the learning process is a key factor in the successful attainment of the POs. The assessment results, particularly those from class activities, projects, and participation, provide insight into how actively students engage with the course material. Low levels of participation might prompt the introduction of new strategies to encourage greater involvement, such as group discussions, peer collaboration, or more practical, real-world applications of course content.

Materials That Demonstrate Achievement of the POs.

The materials used to demonstrate the achievement of the Programme Outcomes (POs) are varied and comprehensive, ensuring that both theoretical and practical aspects of the programme are effectively assessed. These materials serve as tangible evidence of student progress and proficiency in the core competencies defined by the POs. Key materials include:

1. **SWEP and SIWES Logbooks**: The Student Work Experience Programme (SWEP) and the Students Industrial Work Experience Scheme (SIWES) logbooks document students' hands-on experience and exposure to real-world engineering practice. These logbooks provide insights into the application of engineering knowledge in professional environments, helping to assess students' ability to translate theoretical learning into practical skills, which directly relates to the achievement of several POs.

2. **Laboratory Reports**: Laboratory reports serve as a critical tool for demonstrating students' ability to conduct experiments, analyze data, and draw meaningful conclusions. These reports help to assess the students' skills in investigation (PO4), modern tool usage (PO5), and problem analysis (PO2), by providing evidence of their practical and analytical abilities in controlled environments.

3. **Project Report**: The project report is a comprehensive document that encapsulates a student's work on a final year project or research task. It is a vital assessment tool that reflects the application of knowledge to design, problem-solving, and investigation. The project report provides an opportunity to evaluate the achievement of several POs, such as design and development of solutions (PO3), investigation (PO4), and communication (PO10).

4. **Assessments (Assignments, Tests, and Exams)**: Regular assessments, including assignments, tests (Test 1 and Test 2), and final exams, are designed to evaluate students' understanding of the course material. These assessments help in measuring the attainment of specific POs such as engineering knowledge (PO1), problem analysis (PO2), and ethics (PO8). The results from these assessments provide valuable insights into the overall progression of students and their readiness to meet the program's learning outcomes.

These materials collectively provide a holistic approach to assessing and demonstrating the achievement of the POs, offering both formative and summative data that reflect the students' development throughout the programme. They serve as evidence for continuous monitoring and improvement of the programme, ensuring that the educational goals are being met effectively.

The Extent to Which Stakeholders Are Involved

The programme actively engages a range of stakeholders in various processes to ensure the continuous improvement of its quality and relevance. These stakeholders contribute in different ways to strengthen the curriculum, enhance student skills, and prepare graduates for success in their professional careers. The key stakeholders and their involvement are outlined below:

1. **Alumni/Graduate Feedback**: Alumni and graduates provide valuable insights through feedback, which is systematically used to review and improve the curriculum and other academic processes. Their experiences in the workforce help identify gaps in the current curriculum, ensuring that future students are better prepared for industry demands. This feedback loop allows the programme to stay relevant and aligned with the evolving needs of the profession.

2. **Institutional Involvement**: The institution plays a crucial role in developing and refining the curriculum. Faculty, in collaboration with institutional leaders, work together to ensure that the curriculum aligns with current academic standards and industry expectations. Changes to the curriculum are made based on internal reviews, feedback from industry stakeholders, and ongoing academic trends, ensuring that students receive an up-to-date and rigorous education.

3. **Industry Advisory Boards**: Industry advisory boards consist of professionals and experts from various sectors, including chemical engineering, who offer strategic input to maintain the standards of the programme. Their involvement ensures that students are equipped with the skills, knowledge, and competencies needed for successful careers in chemical engineering. By collaborating with industry leaders, the programme stays connected to the practical aspects of the profession and aligns its objectives with real-world challenges.

4. **Employers' Rating of Graduates**: Employers provide valuable assessments of graduates' performance in the workplace. These evaluations serve as a critical tool for appraising the effectiveness of the academic processes and identifying areas of strength and weakness in the programme. The feedback helps the department understand how well its graduates are performing in the industry and what specific skills or knowledge areas require further development to improve future graduates' employability.

5. **Faculty Development**: Faculty members are continuously involved in personal and professional development activities, such as workshops, seminars, and conferences. This ongoing development enhances their teaching methods and course delivery, ultimately benefiting the students. As faculty members improve their own skills and knowledge, they are better equipped to enrich the learning outcomes of the students, ensuring that the programme remains dynamic and responsive to emerging trends in education and the chemical engineering field.

Continuous Quality Improvement (CQI) Strategies to be Implemented in Relation to Programme Outcomes (POs)

The programme implements various CQI strategies to ensure ongoing enhancement and alignment of its educational processes with the Programme Outcomes (POs). These strategies are designed to maintain the quality of the education provided and to respond effectively to emerging trends and needs in the industry. The key CQI strategies are as follows:

1. **External Examiner Review Using the OBE Appraisal Form**: External examiners play a crucial role in evaluating the quality of the programme by reviewing examination questions and providing reports using the Outcome-Based Education (OBE) appraisal form. This independent review ensures that the assessments are aligned with the intended Programme Outcomes and reflect the required academic standards. The feedback from external examiners is used to identify areas of improvement in the assessment methods and content delivery.

2. **Lecture Monitoring for Continuous Improvement**: Regular lecture monitoring is conducted as part of the CQI process. This strategy involves observing and evaluating lecture delivery, ensuring that teaching methods are effective in promoting student engagement and learning outcomes. Feedback

from monitoring sessions is used to enhance the teaching strategies, ensuring that they remain student-centered and relevant to the POs.

3. **Curriculum Review Every 5 Years**: A comprehensive review of the curriculum is conducted every five years to ensure that the programme remains current and aligned with industry needs. The review process involves assessing the relevance and effectiveness of course content and incorporating updates based on emerging trends and technological advancements.

4. **Upgrade of Facilities**: The programme regularly upgrades its facilities to maintain a modern and conducive learning environment. This includes the addition of new smart boards, laboratories, and other technological tools that enhance the quality of teaching and learning. Upgrading the facilities ensures that students have access to the latest resources, enabling them to develop the practical skills required for their professional careers.

5. **Training and Continuous Professional Development of Faculty**: Faculty members are continuously engaged in professional development activities, including seminars, workshops, and training programs. These activities help faculty stay updated with the latest developments in their field, enhancing their teaching effectiveness and ensuring that the content they deliver remains relevant and impactful.