COUNCIL FOR THE REGULATION OF ENGINEERING PRACTICE IN NIGERIA

ENGINEERING ACCREDITATION COMMITTEE (EAC)

ACCREDITATION MANUAL FOR ENGINEERING PROGRAMMES IN NIGERIAN UNIVERSITIES

Doc. Number: EAC -COREN-ACCRED-MANUAL: 004.

August 28th, 2025

Revision	Status Description	Role	Names	Signature & Date
C01	Issued for Approval	**Originator**	EAC Review Team	
		Reviewer	EAC	
		Approval	COREN COUNCIL	

Party	Ref Ind	Name	Sign	Date

Revision Philosophy

i. All NEW documents for review shall be issued at R01, with subsequent R02, R03, etc. as required.

ii. All documents approved for issue, or approved for IMPUT shall be issued at A01with subsequent A02, A03, etc. as required. (Management of Change is required for A02, A03, etc. excluding Issued for Information documents)

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vii. Previous revision details to be removed from the cover page at subsequent issues

viii. Drawings/diagrams revised from previous approved issues are highlighted by 'clouding' the affected areas and by the use of a triangle containing the revision status.

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ACRONYMS

CLOs	Course Learning Outcomes
COREN	Council for the Regulation of Engineering in Nigeria
CQI	Continuous Quality Improvement
E & T	Education and Training Department
FOCI	Federation of Construction Industry
GAs	Graduate Attributes or Graduate Assistants
IEA	International Engineering Alliance
MAN	Manufacturers Association of Nigeria
NASSI	Nigerian Association of Small-Scale Industrialists
NSE	Nigerian Society of Engineers
NUC	National Universities Commission
OBA	Outcome-Based Assessment
OBE	Outcome-Based Education
PEOs	Programme Educational Objectives
POs	Programme Outcomes
RA	Research Assistant
SAR	Self-Assessment Report
SSR	Self-Study Report
TA	Teaching Assistant
WA	Washington Accord

GLOSSARY

Academic staff	Staff assigned to carry out teaching and facilitate learning activities in an engineering Programme leading to the award of a degree.
Accredited Programme	An engineering programme whose graduates are acceptable for registration with COREN. This is accorded to a programme that satisfies the minimum standards for accreditation set by COREN.
Assessment	Assessment is one or more processes that identify, collect, and prepare data to evaluate the attainment of student outcomes. Effective assessment uses relevant direct, indirect, quantitative, and qualitative measures appropriate to the measured outcome. Proper sampling methods may be used as part of an assessment process
Compliance	A criterion, policy, or procedure in which the institution has adequately satisfied the benchmark requirements stipulated in the COREN manual. No corrective measure is required to strengthen compliance before the next review
Concern	A criterion, policy, or procedure broadly in compliance but requiring improvement to avoid the compromised quality of the programme or currently in compliance but the potential exists for the situation to change resulting in non-compliance in the future. Progress on the corrective measures is required before the next review.
Course	A series of lectures on some topics on a particular subject offered in a programme
Deficiency	A criterion, policy, or procedure either does not exist or is in the elementary stage. Compliance is required.
Degree	An engineering qualification in Nigeria recognized by COREN and NUC.
Engineer	An engineering graduate registered with COREN under the provisions of the COREN Act
Evaluation	Evaluation is one or more processes for interpreting the data and evidence accumulated through assessment processes. It determines the extent to which student outcomes are being attained and results in decisions and actions regarding programme improvement.

Faculty/School/College	The entity which includes departments responsible for designing and conducting the programme to be accredited.
Feedback	Information about reactions to a product, a person's performance of a task, etc. which is used as a basis for improvement
Graduate	Anyone who has been conferred a degree
Opportunity For Improvement (OFI)	A criterion, policy, or procedure complies and would be further strengthened by incorporating suggested measures/ improvements
Programme	The sequence of structured educational experience undertaken by students leading to completion, on satisfactory assessment of performance
Programme Evaluators	A panel of evaluators appointed by COREN to verify programme compliance with accreditation criteria
Programme Not Accredited	This is the status of a programme that fails to meet the minimum requirement for accreditation and has major critical deficiencies. In such a case, a further application is not normally considered within the next one year
Programme Outcomes	Programme Outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills, and behaviours that students acquire as they progress through the programme.
Stakeholders	Parties having an interest (direct or indirect) in the programme output, for example, employers, sponsors, faculty members, and students.
Student	Anyone undertaking an undergraduate programme
Support Staff	Staff responsible for supporting teaching, learning, and administrative activities in programme implementation.
Weakness	A criterion, policy, or procedure lacks compliance, compromising the quality of the program. Corrective measures are required to strengthen compliance prior to the next review.
Withdrawal of Accreditation	COREN reserves the right to cease/terminate the accreditation if there is non-compliance or breach of accreditation requirements after accreditation has been given.

FOREWORD

In today's rapidly evolving technological landscape, engineering education must be agile, globally benchmarked, and deeply responsive to local and international expectations. Over the past decades, the Council for the Regulation of Engineering in Nigeria (COREN) has remained firmly committed to enhancing the quality and relevance of engineering education across the country. As President of COREN, and building upon our shared legacy of excellence, I am proud to present this updated Accreditation Manual that represents a significant milestone in our journey towards global recognition and local impact.

Following several years of deliberate reform, capacity development, and stakeholder engagement, I am pleased to inform our academic and professional community that **COREN has successfully attained the status of Provisional Signatory to the Washington Accord** under the International Engineering Alliance (IEA). This historic achievement, attained in 2023, affirms that Nigeria's accreditation system has reached an internationally recognized standard—particularly in its alignment with Outcome-Based Education (OBE) principles.

This recognition is both a validation and a challenge. It validates the tremendous efforts by COREN, our academic institutions, and our Programme Evaluators to embrace global best practices. It also challenges us to further deepen the implementation of the OBE system and to entrench a robust culture of quality assurance and continuous improvement. **Our ultimate goal now is to attain Full Signatory status of the Washington Accord**, which would enable mutual recognition of Nigerian engineering degrees across other signatory countries—thereby opening new vistas for our graduates globally.

To achieve this, COREN continues to strengthen its accreditation mechanisms. This manual is a product of that commitment. It outlines in detail the principles, policies, and procedures of OBE-based accreditation, detailing the ten (10) Accreditation Criteria.

This manual is not just a compliance document - it is a strategic guide for all engineering faculties and stakeholders. It empowers institutions not only to meet the Benchmark Minimum Academic and Professional Standards (BMAPS) but also to create transformational learning experiences that equip graduates with the knowledge, skills, and values needed for the 21st century.

To ensure rigorous and fair evaluation, COREN has trained and certified a new cadre of Programme Evaluators equipped to assess evidence of effective OBE implementation. Accreditation decisions will now be based on a transparent and consistent evaluation framework, distinguishing programmes as accredited for five years, accredited for less than five years or deferred accreditation—based on compliance levels.

COREN remains grateful to our nominating bodies—**the Board of Engineers Malaysia (BEM)** and the **Pakistan Engineering Council (PEC)**—for their steadfast mentorship and guidance during our Washington Accord application process. We also thank the many institutions, faculty members, and Programme Evaluators whose hard work and feedback have shaped this manual.

As we continue this journey towards Washington Accord Full Signatory status, we invite all engineering programmes, regulatory bodies, employers, and stakeholders to partner with COREN in redefining the future of engineering education in Nigeria. Let this manual serve not only as a technical document but also as a symbol of our shared aspiration—to position Nigerian engineers as world-class professionals, locally grounded and globally competitive.

Engr. Prof. Sadiq Z. Abubakar
President
Council for the Regulation of Engineering in Nigeria
1st May, 2025

PREAMBLE TO THE 2019 EDITION

The Council for the Regulation of Engineering in Nigeria (COREN) has a mandate to regulate the practice of Engineering in all aspects and ramifications. At the education level, on behalf of the Federal Government of Nigeria, COREN determines the academic standards of courses and accredits programmes to be offered by institutions training Engineering Personnel. The objective has been to recognize and acknowledge the value added in transforming students admitted into engineering programmes into capable engineering professionals with sound knowledge of the fundamentals, an acceptable level of professional skills, and personal competence for ready employability in the national economy. Such an accreditation process has been in existence since 1972.

Today, after almost fifty years of existence, COREN is faced with some existential realities that make it necessary to change the paradigm of the Nigerian engineering education system.

Firstly, there is an expansion of engineering programmes in variety and number at various engineering faculties. This makes it necessary for COREN to strengthen its accreditation system.

Secondly, the rapid pace of globalization and emerging technologies, make it necessary for engineering faculties to meet the requirements of local employers and international job markets in the Engineering and Technology sectors. COREN needs to mediate in regulating the processes that lead to local and international recognition of engineering qualifications from higher educational institutions in Nigeria. Such mutual recognition is expected to improve the quality, proficiency, and mobility of COREN registered engineers.

In pursuit of the above, in November 2015, COREN applied to become a member of the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) and was accepted at its General Assembly in Perth in 2016. Such membership required COREN programmes to implement the Outcome-Based Education curricula. COREN, in 2018, began the process of the application for the Provisional Signatory Status of the Washington Accord (WA) under the International Engineering Alliance (IEA). Based on the foregoing, the Council inaugurated a committee to develop the framework for Outcome-Based Education (OBE) in Nigerian Engineering Programmes with the production of this Accreditation Manual as part of the terms of reference. This manual consists of four chapters and seventeen annexes to guide engineering programmes in planning, developing, implementing, and reviewing the OBE system and its continuous quality improvements. Such practices make the COREN accreditation visit an accommodating experience rather than a stressful exercise as considered by some institutions. The four chapters are as follows:

i. Accreditation Policy,

ii. Accreditation Process,
iii. Criteria for Accreditation and
iv. Template for COREN Self-Study Assessment Report.

There are also descriptions of the necessary accompanying documents in the annexes.

To meet the requirement of OBE, the accreditation procedures are now based on ten basic criteria:
(i) Programme Educational Objectives, PEOs, (ii) Programme Outcomes, POs, (iii) Course Learning Outcomes, CLOs, (iv) Curriculum and Learning Process, (v) Students, (vi) Continuous Quality Improvement (CQI), (vii) Staffing, (viii) Physical Facilities and Infrastructure, (ix) Industrial Linkages and Community Service and (x) Institutional Support and Funding.

During the accreditation visits, COREN-trained evaluators will be expected to identify pieces of evidence of substantial compliance with the enumerated criteria. COREN makes the final decision on the status of the programme.

This Manual provides detailed guidelines on OBE-based accreditation exercises. It highlights the specific attributes useful to meet the minimum standards stipulated in the COREN BMAPS for the accreditation of existing or newly proposed engineering programmes. Based on the guidance of the Council, this manual is a result of the cumulative efforts of an initial ad-hoc Committee on OBE accreditation guidelines and was later expanded to the Council Committee on Engineering Accreditation Board Implementation consisting of the following: Chairman: Engr. Prof. Sadiq Z. Abubakar, Members: Engr. Prof. Emmanuel Aluyor, Engr. Prof. Stephen J. Mallo, Engr. Prof. Joseph O. Odigure, Engr. Prof. Baba J. El-Yakubu, Engr. Dr. Eyitayo A. Afolabi, Engr. Oladipupo Mabogaje, Mrs. Dooshima Asa and Engr. Precious Onuoha.

I sincerely appreciate the concerted effort of all those who worked tirelessly to ensure the achievement of this goal within such a constrained time limit.

Engr Prof. Joseph O. Odigure
Registrar,
Council for the Regulation of Engineering in Nigeria
29 July, 2019

PREAMBLE TO THE 2023 EDITION

The Engineering Accreditation Committee (EAC) was established by the Council for the Regulation of Engineering in Nigeria (COREN) to handle accreditation matters in line with international best practices in jurisdictions where Outcome-based Education (OBE) is implemented for engineering programmes, and they carry out accreditation of the programmes following Outcome-Based Assessment. With the establishment of EAC, it has become necessary to review the 2019 edition of the COREN OBE Accreditation Manual. Also following the principle of Continuous Quality Improvement, it is necessary to make improvements in some parts of the manual. These reasons led to the production of this 2023 edition of the COREN OBE Accreditation Manual.

The Engineering Accreditation Committee now carries out the assessment of engineering degree programmes in Nigeria and it has published this second edition of the manual.

The contributions made in the review of the 2019 edition of the manual to produce this second edition by the Chairman of EAC, Engr Prof John A. Olorunmaiye; the Deputy-Chairman of EAC, Engr Prof. Baba Jibril El-Yakubu; and a member of the EAC, Engr Dr Nuruddeen M. Musa are highly appreciated.

It is hoped that the Higher Education Institutions implementing OBE will find this manual very useful.

Engr. Prof. Adisa, A. Bello, FNSE, FAEng
Registrar,
Council for the Regulation of Engineering in Nigeria
April 2023

PREFACE TO THE 2025 EDITION

The Council for the Regulation of Engineering in Nigeria (COREN) continues to evolve in its commitment to ensuring that engineering education in Nigeria is of world-class standard, aligned with global best practices, and responsive to national development needs. Since the inception of our accreditation mandate in 1972, COREN has persistently advanced its quality assurance framework, culminating in one of the most significant achievements in our history—attainment of Provisional Signatory status of the Washington Accord (WA) under the International Engineering Alliance (IEA) in 2023.

This milestone is not just symbolic—it is a validation of years of strategic effort, system restructuring, and the widespread adoption of Outcome-Based Education (OBE) across accredited engineering programmes in Nigeria. It signals that COREN's accreditation practices and educational outcomes now satisfy international benchmarks, fostering greater global mobility and professional recognition for Nigerian engineering graduates.

However, our work is yet completed. We aim to attain Full Signatory status of the Washington Accord. COREN is intensifying its efforts in institutional capacity building, accreditation process enhancement and collaboration with universities and professional bodies. Full Signatory status will establish reciprocal recognition of Nigerian engineering qualifications by other signatory countries—unlocking opportunities for academic progression, international employment, and cross-border professional licensing for our engineering graduates.

This updated edition of the COREN Accreditation Manual is a key instrument in this transformational journey. It provides comprehensive guidance on the implementation of the OBE system—emphasizing a paradigm shift from content-based to outcomes-focused education. The manual is structured into four main chapters and seventeen annexes, covering the following core areas:

- Accreditation Policy
- Accreditation Process
- Criteria for Accreditation
- Template for the COREN Self-Study Assessment Report

The ten essential criteria that form the foundation of OBE-based accreditation - namely, Programme Educational Objectives (PEOs), Programme Outcomes (POs), Course Learning Outcomes (CLOs), Curriculum and Learning Process, Students, Continuous Quality Improvement (CQI), Staffing, Physical Facilities and Infrastructure, Industrial Linkages and Community Service, and Institutional Support and Funding - remain the pillars of assessment during accreditation visits.

COREN has continued to expand its pool of trained evaluators to conduct robust, fair, and forward-looking accreditation exercises. Institutions are now encouraged to engage in the accreditation process not as a mere compliance exercise, but as a strategic opportunity for institutional growth and academic excellence.

This manual reflects the cumulative efforts of dedicated professionals and academic leaders who contributed to developing a credible and comprehensive framework for OBE implementation. I wish to acknowledge the foundational work of the original ad-hoc committee consisting of the following: Chairman: Engr. Prof. Sadiq Z. Abubakar, Members: Engr. Prof. Emmanuel Aluyor, Engr. Prof. Stephen J. Mallo, Engr. Prof. Joseph O. Odigure, Engr. Prof. Baba J. El-Yakubu, Engr. Dr. Eyitayo A. Afolabi, Engr. Oladipupo Mabogaje, Mrs. Dooshima Asa and Engr. Precious Onuoha. I wish to also acknowledge the subsequent formed Engineering Accreditation Committee (EAC), whose (i) former chairman – Engr. Prof. John A. Olorunmaiye, (ii) current Chairman – Engr. Prof. Christian Bolu and (iii) members laid the groundwork for this internationally aligned system.

I extend my heartfelt gratitude to all contributors and stakeholders who have supported this vision. Let us continue to work together to ensure that Nigerian engineering education not only meets national development goals but also ranks proudly among the best in the world.

Engr. Prof. OAU Uche
Registrar,
Council for the Regulation of Engineering in Nigeria
1st May, 2025

CHAPTER 1

ACCREDITATION POLICY

1.1.INTRODUCTION

The Council for the Regulation of Engineering in Nigeria (COREN) is a statutory body set up by the Federal Government of Nigeria with the mandate to regulate the practice of Engineering in all aspects and ramifications. It was established by Decree 55 of 1970, amended by Decree 27 of 1992 and now, Engineers (Registration, etc.) Act CAP E 11, 2004 which was further amended by the Engineers (Registration, etc.) (Amendment) Act No 3, 2018. COREN is empowered by its mandate to carry out the following:

- Accreditation of Engineering Programmes
- Registration of Engineering Personnel and firms
- Regulation and Control of Engineering Practice

1.2.COREN VISION AND MISSION

VISION:

To promote and ensure the highest standards of professionalism in engineering practice in Nigeria.

MISSION STATEMENT:

- To register and license Engineering Personnel and Firms and make provisions for the control of engineering practice.
- To determine the academic standards of courses and accredit programmes to be offered by institutions training Engineering Personnel.
- To foster speedy acquisition of relevant engineering and technological skills through Continuous Professional Development.
- To ensure that engineering is practiced to improve the quality of life and promote sustainable development.
- To promote and ensure stability and cooperation within the Engineering family.

Thus, this Manual provides the necessary information for the processes and procedures for conducting an accreditation exercise for engineering programmes in Nigerian Universities. It also provides guidelines for the commencement of engineering programmes in institutions and for the re-accreditation of existing programmes.

1.3.NEED FOR ACCREDITATION / RECOGNITION

One of the objectives of accreditation is to acknowledge and validate the quality of training received by students who are enrolled in engineering programmes. This leads to the enhancement of the quality of their training so that they become competent engineers equipped with strong engineering fundamentals, appropriate skills, and personal competence, thereby making them employable after graduation.

The accreditation process has been in existence in Nigeria since 1972. The current expansion in engineering programmes in variety and numbers at different higher institutions makes it necessary to strengthen the system. This is because it is not possible to meaningfully sustain the present growth rate without a parallel exercise in quality assessment of the programme(s). Such an exercise will ensure that the institution running the programme(s) has the necessary facilities, equipment and faculty resources for the programme(s), to deliver technically competent manpower that meets the local employers' requirements and global job market in the Engineering and Technology sectors. This process leads to local and international recognitions of engineering graduates from higher educational institutions in Nigeria.

1.4.OBJECTIVES OF ACCREDITATION

(a) To establish the standard of knowledge and skill that are to be attained by persons seeking to become Registered Engineering Personnel and to review those standards from time to time as circumstances may permit;
(b) To ensure that graduates of engineering programmes accredited by COREN are adequately prepared academically and possess the necessary skills to pursue productive and successful careers as professional engineers;
(c) To help parents, students, and the general public to identify engineering programmes run in various higher educational institutions that meet the standard of COREN in complying with accreditation criteria;
(d) To encourage higher educational institutions in Nigeria, to improve on their training of engineers through the implementation of Continuous Quality Improvement (CQI) which is an important requirement in the Outcome-based Education accreditation system; and
(e) To provide standards for upgrading existing engineering programmes and establishment of new programmes in higher educational institutions in Nigeria;
(f) To formulate from the outcomes of accreditation visitations an industrial training policy which could form the basis of legislation by the Federal Government to ensure meaningful industrial training of engineering students.

1.5. THE ACCREDITATION MANDATE OF COREN

The Act Section 1 (1) (b) (i) (as amended by Act No.3 2018) also states that COREN shall have the duty of:

> ***"Determining what standards of knowledge and skill are to be attained by persons seeking to become registered as engineering practitioners and to raise those standards from time to time as circumstances may permit".***

Saddled with the responsibility to register engineering practitioners, the Act in Section 6 (1) (a) – (c), amongst others, stipulates that a person shall be registered by COREN if:

(a) *He has attended a course of training approved by the Council under the following section;*
(b) *The course was conducted at an institution so approved, or partly at one such institution and partly at another or others;*
(c) *He holds a qualification so approved.*

Section 9 provides conditions for the approval of courses, qualifications and institutions. Similarly, Section 9 (1) states that:

> "…the Council may approve for the purposes of subsection (2) of section 6:

(a) *any course of training which is intended for persons who are seeking to become, or are already, members of the engineering profession, and which the Council considers is designed to confer on persons completing it sufficient knowledge and skill for the practice of that profession or for practice as members of a specialized branch of that profession;*
(b) *any institution either in Nigeria, or elsewhere, which the Council considers is properly organized and equipped for conducting the whole or any part of a course of training, approved by the Council under this section.*

Worthy of note also is that the Act in Section 9 (3) (6) states that:

(3) The Council may, if it thinks fit, withdraw any approval given under this section in respect of any course, qualification or institution;

(6) An educational institution for the training of persons in the engineering profession shall submit a syllabus of its programme, content, and minimum facilities to the Council for approval before a course approved by the National Universities Commission or the National Board for Technical Education, or any other engineering body, is commenced.

COREN, therefore, carries out this mandate through the Accreditation of engineering Programmes in Universities, Polytechnics, and Technical Colleges. The exercise is geared towards quality assurance; hence accreditation ensures that products of: engineering programmes in universities; engineering technology programmes in Universities and Polytechnics; and engineering trade programmes in Technical Colleges and Vocational

Training Centers are sound, functional and efficient engineering practitioners that meet the challenges of our present and future society. This means that COREN ensures that the right quality of training is given to all cadres of engineering practitioners, (engineers, engineering technologists, engineering technicians, and engineering craftsmen), and institutions produce industry-compliant graduates. COREN also registers and licenses all these categories of engineering personnel, as well as firms to practice in Nigeria.

It is, therefore, mandatory for every engineering programme in any higher educational institution in Nigeria, to be accredited by COREN since only graduates of accredited engineering programmes will be registered and licensed by COREN to practice in Nigeria.

It should be noted that The Council for the Regulation of Engineering in Nigeria (COREN) has established the Engineering Accreditation Committee (EAC) to independently carry out accreditation of Engineering degree programmes on its behalf.

1.6. HISTORY OF ACCREDITATION OF ENGINEERING PROGRAMMES IN NIGERIA

Section 9 subsection 6 of the Act provides:
"an educational institution for the training of persons in the Engineering profession shall submit a syllabus of its programme, content, and minimum facilities to the Council for approval before a course approved by the National Universities Commission or the National Board for Technical Education is commenced".

Pursuant to the above, COREN started accreditation of engineering programmes in Nigerian Universities in 1972 shortly after the inauguration of the Council. Council Committees accredited four Universities offering twelve (12) engineering programmes. The universities were:

i. University of Ife (now Obafemi Awolowo University);
ii. Ahmadu Bello University Zaria;
iii. University of Lagos; and
iv. University of Nigeria, Nsukka.

The accreditation exercises were extended to some universities in the United Kingdom and Asia, particularly when graduates from these foreign countries applied for registration with COREN. In March 2018, COREN conducted accreditation visits to the twenty-three (23) engineering programmes of three (3) universities in Northern Cyprus. COREN has carried out countrywide awareness for the accreditation process including the requirement of approval before the commencement of engineering training in any Nigerian university.

COREN compiled and published the Benchmark Minimum Academic Standards and Accreditation Scoring Criteria for Undergraduate Engineering Programmes in Nigerian Universities in September 2013. Concerned with the large disconnect between what is taught (engineering curricula and the limited skills and tools) in engineering programmes around the country and that which is expected of young engineers in the industries and society, it therefore became clear that engineering education needed to be changed (or even reinvented) to address the challenge. The need to change the training procedure from quantitative to qualitative assessment led to the revision in 2017 of Accreditation Manual and the re-naming of the document as Outcome-Based Engineering Education Accreditation Manual.

Today, after almost fifty years of existence, COREN is faced with some existential realities that make it necessary to change the paradigm of the Nigerian engineering education system. Thus, due to the expansion of engineering programmes in variety and number at different higher institutions as well as the rapid pace of globalization and emerging technologies, COREN seeks to strengthen its accreditation system to meet the requirement of local employers and international job market in the Engineering and Technology sectors. This may also lead to mutual recognition to improve the quality, proficiency and mobility of COREN registered engineers.

In pursuit of the above, in November 2015, COREN applied to become a member economy of the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) and was accepted by FEAIP at its General Assembly (GA) in Perth 2016. Institute of Engineers, Malaysia (IEM) was appointed by FEIAP to review the accreditation system of COREN to ascertain the substantial equivalence of COREN recognized degrees with those of other member economies of FEIAP. A visit was organized by COREN in collaboration with UNESCO, ISTIC (International Science, Technology and Innovation Center) and FEIAP from 17-22 July 2016 tagged **"High Level Policy Forum on Engineering Accreditation and Mobility in Africa"** with Participants drawn from the relevant stakeholders from Nigeria, Cameroon, Ghana, Sudan, Tanzania, and Kenya. The FEIAP Review Panel also undertook visits to two Nigerian universities whose degree programmes were accredited by COREN.

It therefore became important to introduce components of Outcome-Based Engineering Education (OBEE) such as Programme Educational Objectives, Programme Outcomes, Course Learning Outcomes, Continuous Quality Improvement and Quality Management Concept, involvement of the stakeholders such as academic staff, students, industry players, alumni, and university authority in the education process. Training on outcome-based education in Nigeria commenced with the invitation of experts from other FEIAP economies who had fully implemented outcome-based engineering education to train COREN, university administration staff, professors, and academic staff, as well as a panel of assessors (or evaluators) on the basics of outcome-based learning. The introductory

workshop tagged "Outcome-Based Engineering Education and Review of Benchmark Minimum Academic Standard (BMAS) and Accreditation Scoring Criteria for Undergraduate Programmes in Nigerian Universities", took place from 11th - 14th May 2017 at the Renaissance Lagos Ikeja Hotel, 38/40 Isaac John Street, Ikeja GRA, Lagos.
Pursuant to the need for an independent accreditation system, COREN enacted the Regulations on Accreditation of Engineering Programmes in Nigeria and inaugurated Engineering Accreditation Committee (EAC).
The EAC operates independently using this COREN OBE Accreditation Manual for Engineering Programmes in Nigerian Universities and COREN Programme Evaluator Guidelines.

1.7. ENGINEERING ACCREDITATION COMMITTEE

In line with international best practices, COREN established an independent committee called the Engineering Accreditation Committee (EAC). The Engineering Accreditation Committee (EAC) has been established and published as the Federal Republic of Nigeria Official Gazette, No. 83, Vol. 109 of Government Notice No. 113. It is published as a supplement to the Gazette with Serial No. 65, known as "Regulations on Accreditation of Engineering Programmes in Nigeria".

1.7.1. **Membership**

The Engineering Accreditation Committee (EAC) consists of the following members appointed by the Council:

a) Chairman (nominated by COREN).
b) A Vice Chairman (nominated by The Nigerian Society of Engineers (NSE)).
c) 10 members representing each of the major branches of engineering (e.g., Civil, Mechanical, Electrical, Chemical, and Agricultural) and each of the constituent organizations nominated by COREN, NSE, NUC, and major employers of engineers (MAN, Military, FOCI, NASSI, etc), as listed below:

   (i) 4 members nominated by COREN
   (ii) 2 members nominated by NSE
   (iii) 1 member nominated by NUC
   (iv) 3 members from the major employers of engineers in Nigeria
d) The Registrar of COREN or his representative

The Chairman of EAC shall oversee the operations and functioning of EAC and preside at all Committee meetings.

The Vice Chairman of EAC shall assist the Chairman in the Accreditation process and act as Chairman in his absence.

The Registrar shall be the Secretary of the Engineering Accreditation Committee.

The term of office for the Chairman, Deputy Chairman, and members is two (2) years renewable for another term of two years. The EAC shall comprise persons from academic institutions and industries and all members shall be COREN Registered engineers.

The Accreditation Department of COREN shall serve as the secretariat of the EAC. It shall be facilitated by COREN Zonal and Area offices. The EAC shall meet at such time and place and such frequency as shall be decided by the Chairman in so far as however, it shall meet at least quarterly in a calendar year. To assist EAC in its task, a panel of Programme Evaluators from both academia and industry, shall be constituted from the list of trained and certified Programme Evaluators to carry out the accreditation of an engineering programme.

1.7.2. **Functions of Engineering Accreditation Committee**

The functions of the EAC shall be to:

i. implement COREN Accreditation policies;
ii. formulate guidelines and procedures for Accreditation and the launch of new Engineering programmes;
iii. evaluate the programmes at regular intervals of five years, with the third year being the preparatory period for the next Accreditation;
iv. appoint an Accreditation Team whose members shall be drawn from the list of Accreditation Evaluators to accredit each Engineering programme;
v. receive and review evaluation reports by the Accreditation Teams, to decide on the Accreditation status and communicate its findings to the institutions concerned after Council's notification;
vi. publish a directory of all accredited programmes (First Schedule) at least one week after every Council meeting;
vii. carry out capacity building/training for faculty, Programme Evaluators, Quality Assurance Directors, EAC Members, Engineering Education and Accreditation Department staff, etc;
viii. compile and update a register of trained Programme Evaluators from which shall be drawn Accreditation Team members; and
ix. suspend or withdraw the Accreditation of any programme that is no longer in conformity with the laid down criteria on which Accreditation was initially given.

1.7.3. **EAC Finances**

EAC is a financially self-supporting body that obtains its funds mainly from fees charged for accreditation visitation. Universities or relevant institutions pay fees for various types of accreditation visits (as prescribed by COREN) and the student index portal. Other

sources of funds are contributions from industries as part of their corporate social responsibility. Budget deficits, if any, are met by COREN.

1.8.OUTCOME-BASED EDUCATION DESK OFFICER

In order to facilitate sustainable implementation of Outcome-Based Education (OBE) in Engineering, COREN encourages each university running Engineering Programmes to appoint one OBE Desk Officer.

1.8.1. Functions of OBE Desk Officer

Every college/faculty or school that offers at least one engineering programme should appoint at least one officer (to be called OBE Desk Officer) who shall:

i. Ensure full compliance with the requirements of COREN BMAPS by each programme;

ii. Ensure implementation of OBE in all teaching/learning processes by each programme, as outlined in the COREN OBE Accreditation Manual;

iii. Guide engineering programme managers such as Heads of Departments and Examination Officers on teaching/learning best practices as outlined in the COREN Accreditation Evaluators Manual;

iv. Ensure periodic review and update of Programme Educational Objectives (PEOs);

v. Ensure the teaching/learning process meets attainment targets of Programme Outcomes (POs);

vi. Guide teaching staff on developing and using appropriate Course Learning Outcomes (CLOs) for curriculum delivery, assessment and evaluation;

vii. Map CLOs to POs and POs to PEOs to show the relevance of classroom activities to market demands of knowledge, skill, and attitudes of engineering graduates;

viii. Guide students to have relevant experiences during SIWES/IT exercises; and

ix. Ensure Continuous Quality Improvement (CQI) of teaching/learning processes in accordance with OBE requirements.

1.9.TYPES OF ACCREDITATION VISITATIONS

The Engineering Accreditation Committee of COREN conducts the following types of accreditation:

1.9.1. **Resource Verification Visit**

Institutions shall apply for a Resource Verification Visit by providing detailed information to EAC on the extent to which they have met the essential requirements for starting a new engineering programme based on the information provided in COREN accreditation documents. Resource Verification Visit is mandatory and the details/deadlines to submit the application are as specified in the Accreditation Manual which can be accessed on the COREN website.

Resource Verification shall be but not limited to the following:

Physical facilities like the classrooms and accessories, laboratories and accessories, buildings, equipment, including hardware and software; staff offices, information and communication technology, lecture manuals, etc.

The Resource Inspection visit is usually an opportunity for the institution to get professional advice from COREN on all aspects of the programme that need to be put in place. The Institution shall apply for Resource Verification at least 9 months before the first intake of students. If the engineering facilities and equipment are found to be below standard, the institution shall be given a grace period of six (6) months to put deficiencies in place and call back COREN for a Resource Inspection visitation.

1.9.2. **Pre-Accreditation Visit**

Two years after the initial approval, EAC shall conduct pre-Accreditation. A programme that substantially meets the relevant requirements shall be granted "Passed Pre-Accreditation" by EAC and a normal accreditation visit shall be conducted just before the first set of students graduates and thereafter once every five (5) years.

The programme approved by COREN through the Resource verification visit, are required to apply for a pre-accreditation visit at the end of first year to ascertain its preparedness for the next phases. The institution shall provide detailed information for critical analysis along with the progress made based on the recommendations from the Resource verification. The details to submit and deadlines to meet for the pre-accreditation can be accessed on the COREN website.

1.9.3. **Accreditation Visit**

An institution applying for an accreditation visit is expected to fulfil all the requirements about faculty, curriculum, laboratories, library, infrastructure, finances, and other allied facilities as per the accreditation guidelines. Any programme seeking accreditation for the first time is required to ensure submission of the necessary documents to EAC before the commencement of the first semester for the accreditation visit towards the end of the fourth semester.

The programmes seeking renewal of accreditation status (Re-Accreditation) should apply within the last year, but not exceeding three months before the expiration of the accreditation period granted.

Note: More information on the requirements for the types of accreditations are in Annex M.

1.9.4. **Post Accreditation Visit**

To ensure that the Council maintains the standard in accreditation throughout the accreditation period given to programmes, EAC shall conduct unannounced Post Accreditation visits to the programmes.

1.10. CONFIDENTIALITY

All Documents or other pieces of information obtained during the process of accreditation exercise shall be treated as confidential.

1.11. CONFLICT OF INTEREST

Members of the EAC, Programme Evaluators, and Accreditation Department staff are expected to be constantly aware of any conflict of interest. Members shall declare their interest or withdraw from any situation or activity that may constitute a conflict of interest, either as directly or indirectly affiliation to such institutions.

CHAPTER 2
ACCREDITATION PROCESS

2 ACCREDITATION PROCESS

2.1 INTRODUCTION

The process of carrying out accreditation of engineering programmes following the Outcome-based Education system is described in this chapter. The accreditation process - for a Resource Verification, Pre-Accreditation or Accreditation visitations, involves a comprehensive assessment which starts with a review of the information submitted in a Self- Study Report (SSR), followed by a detailed on-site accreditation visit by the Accreditation Team selected by EAC; and preparation of the accreditation report on findings and recommendations by the team to EAC.

2.2 PROCEDURE FOR INTRODUCTION OF NEW PROGRAMMES

An institution intending to begin a new programme shall seek approval from the relevant authorities as specified by the COREN Act.

Based on national manpower requirements, the National Universities Commission (NUC), approves an Engineering Programme to be offered in universities. COREN then requests EAC to carry out a Resource Verification visitation to the Engineering programme and based on the findings, EAC approves the commencement of the programme or otherwise. It is EAC that determines whether the Engineering programme has adequate facilities to commence teaching and learning of the programme. It is therefore illegal to commence an Engineering programme without initial approval by the EAC.

2.3 PROCEDURE FOR ACCREDITATION VISIT

EAC shall conduct the accreditation of engineering programmes based on the following steps:

a. Identify and Publish programmes that are in the last year of their accreditation statuses.
b. EAC notifies concerned institutions on accreditation expiration (at least 12 months).
c. At least, four (4) months before the expiration of the existing accreditation status of the programme, a completed SSR shall be sent from the institution informing EAC of their readiness for the accreditation exercise. If the SSR submitted is found satisfactory

upon review, COREN schedules an accreditation visit. Otherwise, EAC shall inform the institution to provide further information or other appropriate actions before an accreditation visit is scheduled.

d. Selection/Notification of Programme Evaluators by EAC.
e. EAC sends the list of the Evaluators to the institution (30 days before the Accreditation Visit) to resolve any conflict of interest.
f. EAC sends the SSR and other necessary documents to the Programme Evaluators at least 4 weeks before the scheduled visit. PEVs should submit a preliminary Grading worksheet to the EAC, at least 2 weeks before the visit.
g. Based on the SSR, the Programme Evaluators fill the PEVs Grading Sheet and submit to Team lead, at least two weeks to the Accreditation Visit.
h. The visitation team conducts the accreditation process and prepares a report on their findings using the COREN Accreditation Manual, Programme Evaluator Guidelines, and the Outcome Based Engineering Education: Benchmark Minimum Academic and Professional Standards (BMAPS) and Accreditation Rubric for Undergraduate Engineering Programmes.
i. Presentation of the report on accreditation visitation to EAC.
j. Deliberation of the accreditation reports and decision-making by EAC.
k. The decision of EAC is forwarded to COREN Council for notification.
l. The Registrar communicates the decision on the status of accreditation to the concerned institutions on behalf of EAC.
m. COREN updates the institution's accreditation status on the COREN website.

2.4 THE ACCREDITATION PROCESS

The diagram of the accreditation process and timeline from the stage of application to the notification of accreditation result, are presented in Figure 1.

2.5 ACCREDITATION EVALUATION

An accreditation evaluation is conducted to verify that the programme under evaluation is in compliance with the appropriate accreditation criteria in this Manual. The evaluation exercise shall be conducted by a Team of Evaluators appointed by EAC.

2.6 THE ACCREDITATION TEAM

The Accreditation Team for a visitation to an institution shall consist of a Team ~~Leader~~ Lead, two Programme Evaluators per programme (one from industry and one from academia), and members of staff from COREN to provide secretariat and other support services. They shall be selected based on relevant qualification, professional experience, previous training on accreditation they have received and recent performance assessment.

Team Members shall consist of Engineers drawn from the Industry and Academia based on their expertise in a particular discipline. They are expected to contribute to the assessment of the programme from their perspectives and experience. In addition, they are expected to maintain high professional standards and have no conflict of interest with the institution to be visited.

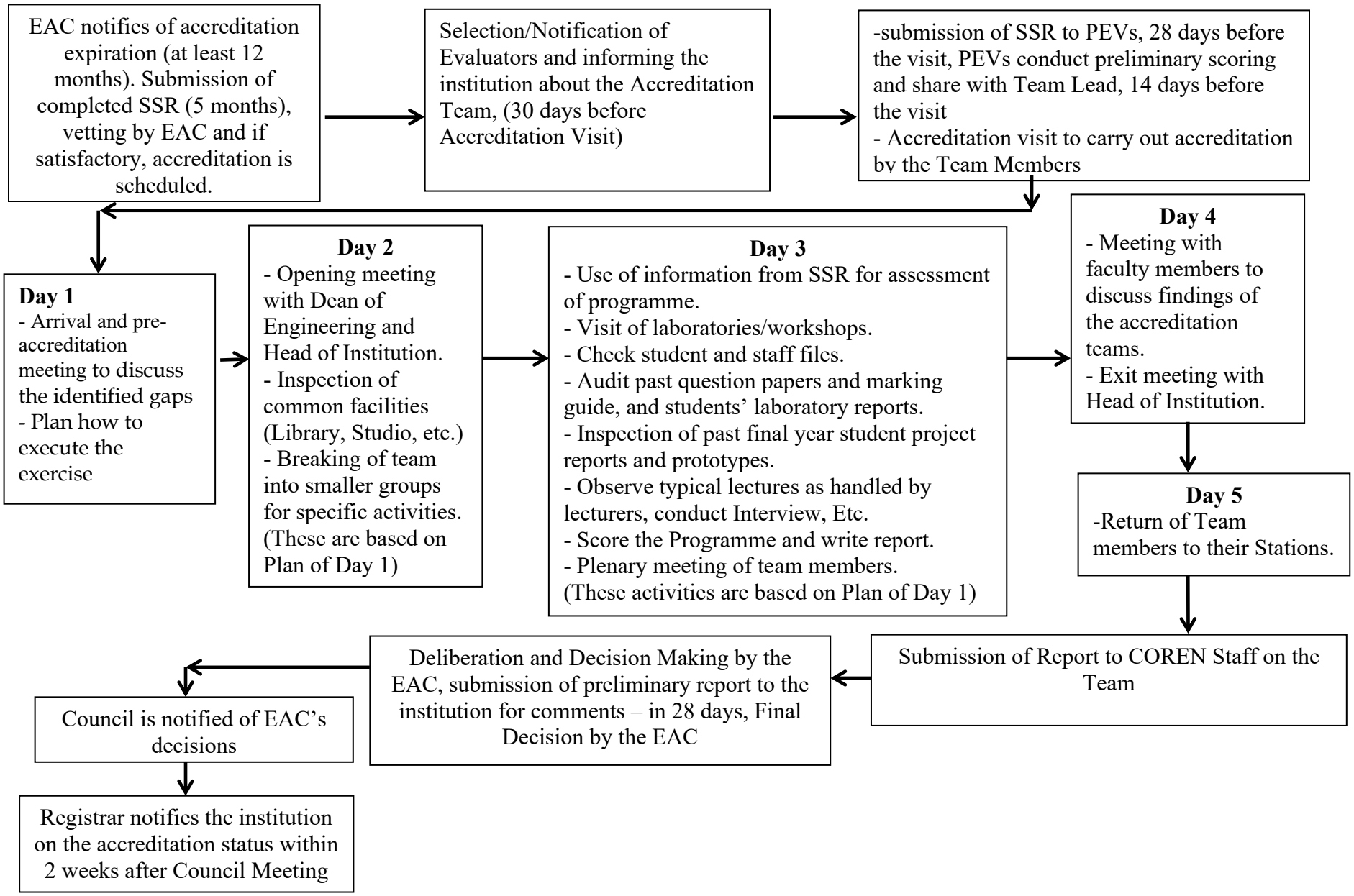


Figure 1: Flow Chart of Accreditation Process and Timeline

2.7 SELECTION OF PROGRAMME EVALUATORS

Evaluators shall be selected based on their high standing in the profession, ability to assess curricula, competence in appraisal based on overall objectives and performance towards the achievements of set goals.

Evaluators from academia shall be at the professorial cadre level while the representative from industry must have a minimum qualification of a First degree and should be on an equivalent of Grade Level 15 of the Civil Service. EAC shall conduct periodic accreditation training workshops for all Accreditation team members and maintain an updated database of qualified Evaluators for all engineering disciplines. EAC shall select evaluators from the database. Evaluators are expected to have good understanding of EAC Accreditation policies as stipulated in the BMAPS, COREN Accreditation Manual and Programme Evaluator Guidelines.

Evaluators shall be highly knowledgeable and experienced engineers with the following qualities:

i. High level of integrity
ii. Firmness and fairness
iii. Minimum of 6 years' registration with COREN.
iv. Maintain an up-to-date practicing licence.
v. Active participation in the activities of the Engineering profession such as COREN Assemblies and other world engineering conferences / activities.

Upon determination of an accreditation team, institution may request for certain designated Evaluators to be excluded from the team in case of any conflict of interest by submitting a justified reason in writing to EAC within a week after receiving the schedule of visiting team. In case of valid reason(s), EAC will replace the Evaluator(s).

2.7.1 The Team ~~Leader~~ Lead

The Leader lead of an accreditation team shall oversee the accreditation visit. He or she shall assign duties to each team member keeping in view the overall perspective. He or she is expected to have good experience with the accreditation process and collate in advance, previous reports, if any. He or she has the responsibility for the preparation of the consolidated team report and its timely submission, for the consideration of the EAC.

One of the senior members of the Visiting Team will be appointed to lead the Team, if the ~~Leader~~ team lead is unable to undertake the visit for unforeseen circumstances. There shall be only one Team ~~Leader~~ lead whenever more than one programme is visited in an Institution.

2.7.2 Team Members

Two Evaluators, who are appointed by EAC, are responsible for the evaluation of an individual programme. An additional member from the industry or user organization can be included especially in the final visit during the 5th year of the programme. In case two programmes with substantial similarity in course contents are being offered in an Institution, a single set of two/three Evaluators may be used for both programmes. For programmes in emerging or inter-disciplinary areas, more Evaluators can be included in the team depending on the need.

The duties of Evaluators shall include evaluation with reference to the criteria given earlier above, through physical verification of infrastructure/ facilities, records, interviews with administrators, academic staff, alumni, students/stakeholders and other activities, which they find necessary for the accreditation exercise. The Evaluators are also required to mention the strengths, weaknesses, defects and concerns against each component of a criterion in the Programme Evaluators Worksheet. They may capture photographs of documents as evidence when necessary, during the accreditation.

Evaluators must be informed ahead of time and their availability ascertained prior to the accreditation exercise. The institution shall be informed about the composition of the visiting team. The institution may object to the assignment of an Evaluator provided it submits proof of any verifiable conflict of interest with the assigned Evaluators.

In case an Evaluator is unable to undertake the visit due to circumstances beyond his or her control, the team ~~leader~~ lead should notify EAC to nominate a replacement, keeping in view the guidelines for selection of Evaluators as contain the COREN Manuel.

2.7.3 COREN Staff

COREN Staff shall be responsible for the provision of all secretarial and any other services that may be required for the success of the accreditation exercise. They shall coordinate between visiting team members and the institution and ensure the availability of relevant information. They shall give detailed briefings about the visit, institutional data and previous accreditation visit report(s) to the Team ~~Leader.~~ Lead. They will also ensure the compilation of the visit report on the last

day of the visitation for submission to EAC and provide necessary policy updates to the visitation team when and where required. COREN Staff participating in the accreditation of engineering programmes shall be expected to obtain the requisite certification.

2.8 ASSESSMENT CRITERIA FOR ACCREDITATION

The accreditation team shall examine the following areas of the programme for assessment:

a) PEOs,
b) POs and
c) CLOs,
d) Curriculum and Learning Process
e) Students
f) Continuous Quality Improvement (CQI)
g) Staffing
h) Physical facilities and Infrastructure,
i) Industrial Linkages and Community Service
j) Institutional Support and Funding

Specific scoring criteria for assessment are presented in Annex P.

2.9 ASSESSMENT GUIDELINES

Evaluation of programmes shall be evidence-based in strict adherence to the criteria set in the COREN BMAPS, Programme Evaluator Guidelines and this Manual. The assessment shall include the auditing and confirmation of documents submitted by the Institution. In giving qualitative assessment, Programme Evaluators shall follow the guidelines provided in the COREN Rubrics Defining Deficiency, Weakness, Concern, Opportunity for Improvement, and Satisfactory compliance (D, W, C, OFI, and S) for Programme Evaluation Worksheet which can be found in the Programme Evaluator Guidelines.

2.10 DOCUMENTS FOR ACCREDITATION

The documents required for accreditation are specified in COREN publication titled: "Outcome Based Engineering Education: Benchmark Minimum Academic Standards and Accreditation Scoring Criteria for Undergraduate Engineering Programmes in Nigerian Universities", the most current Edition and this Accreditation Manual. These are useful tools for ensuring that every important aspect of a degree programme and its delivery are assessed and reported.

Self-Study Report prepared for an engineering programme of the University to be visited is submitted 3 months before commencement of accreditation visit.

2.11 OUTCOME OF ACCREDITATION VISIT

The decision on programme accreditation actions rests with EAC. The accreditation team takes decision based on evaluators' inputs.

The following terms will guide the decision:

Full Compliance (Y): A criterion, policy, or procedure has adequately satisfied the benchmark requirements stipulated in the manual. No corrective measure is required to strengthen compliance prior to the next review.

Opportunity For Improvement (OFI): A criterion, policy, or procedure is in compliance and would be further strengthened by incorporating suggested measures/ improvements.

Concern (C): A criterion, policy, or procedure is broadly in compliance but requires improvement to avoid compromising the quality of the program or is currently in compliance but the potential exists for the situation to change, resulting in future noncompliance. Progress on the corrective measures is required prior to the next review.

Weakness (W): A criterion, policy, or procedure lacks compliance, compromising the quality of the program. Corrective measures are required to strengthen compliance prior to the next review.

Deficiency (D): A criterion, policy, or procedure either does not exist or is in the elementary stage. Compliance is required.

The following actions on the visited programme may be decided by EAC based on the report by the accreditation team.

a. Full Accreditation (FA) for five years – This action indicates that the programme substantially complied with the requirements in the BMAPS and Chapters 3 and 4 of this Accreditation Manual in all areas of evaluation. Such a programme is then valid to run for five (5) years subject to maintaining and improving on the standards as may be verified through regular monitoring of the programme by EAC through post-accreditation visitation.

Programmes that do not meet substantially with the accreditation requirements stated above shall be given accreditation as follows:

b. Accreditation for less than five years – This action indicates that the programme has one or more major Weaknesses and/or serious concerns. Programme s meets all the accreditation criteria, but no critical deficiency. The accreditation team may decide that the Programme submit a report on the remedial actions taken to address the issues The accreditation is for a period of less than five years.

c. Deferred / Pended Accreditation to ensure removal of deficiencies - This action indicates that a currently accredited programme has one or more Critical Deficiencies. The EAC may decide that the Deficiencies are such that a progress report or/and on-site visit will be required to evaluate the remedial actions taken by the institution. This action has a typical duration of not more six months.
d. Not Accredited – This indicates that a Programme is not ready for accreditation due to non-compliance to one or more criteria.

If the report submitted or/and site-visit conducted are adjudged satisfactory [for decision in (c)], EAC may then extend the accreditation status to a typical duration of five years (or another five years). Otherwise, the programme gets a Failed Accreditation status and is asked to stop admitting new students, as graduates of such an unaccredited programme shall not be registered by COREN with COREN equally publishing the name of such institutions in the newspapers, medias and any public domain for members of the public to be fully aware. EAC's decision upon notification to the COREN Council shall be sent to the institutions. The hard and soft copies of the accreditation report shall be stored as appropriate. The accreditation shall be awarded to a specific programme, in a specific location and a specific mode of delivery.

2.12 APPEALS

If an institution decides to appeal against the decision of EAC on the accreditation of a programme, a written application along with the prescribed fee, addressed to the President of COREN, should be submitted to COREN headquarters within 30 days of receiving the results of the last accreditation visit to the programme. On receiving such an appeal, the President of COREN will take appropriate action following the provision in Regulations on Accreditation of Engineering Programmes in Nigeria.

2.13 PUBLICATION OF ACCREDITATION STATUS

COREN shall regularly update and publish the list of all accredited programmes in all media domains for the purpose of educating members of the public

2.14 REVALIDATION OF AN ACCREDITED PROGRAMME

The Institution shall submit to EAC, details of any changes made to an accredited programme under the following circumstances:

i. An increase in students' enrolment.
ii. A change in the scope of the programme objective /curriculum/nomenclature.
iii. Addition of new stream/specialization in the programme's scheme of study.

iv. Change of mode of delivery, etc.

Failure to do so may cause EAC to withdraw the accreditation. COREN may then direct the Institution to apply for re-accreditation of the revised programme. The application for this visit must be submitted at least 6 months before the date of effective implementation of the proposed change.

2.15 SCHEDULING A VISIT

A visit shall be arranged and coordinated by EAC through the Education &Training Department. After an appropriate date suitable to both EAC and the Institution is decided, EAC shall appoint Evaluators. It is important that as far as possible, the agreed dates of visit are adhered to. The accreditation visit will normally be scheduled for a period of four (4) days.

DAY1	
	Arrival, Accreditation Team check into accommodation
7:00PM	Dinner and pre-accreditation meeting. This is to enable them to discuss the identified gaps based on preliminary review of the submitted SSR and plan how to execute the accreditation exercise. Further information required from the programme should be communicated to the HoD/Dean through the Team Leader.
DAY 2	**The following suggested activities should be modified based on the outcomes of the pre-accreditation meeting on Day 1.**
7.00 AM	Breakfast
8.00 AM	Opening meeting with the Dean and Head of Departments
9.00 AM	Courtesy call on Vice Chancellor accompanied by Dean and Head of Department
10.00AM	Team visits common facilities used by the faculty – Library, Workshop, Laboratories, Design studios, General Environment, etc
1.00 PM	Lunch
2.00 PM	Presentation by the Head of Department of the programme being evaluated and ensuing discussions.
3.00 PM	Meeting with staff members

4.00 PM	Teams tours Departmental facilities – classrooms, offices, laboratories, workshops, etc.
5.30 PM	Team retires to discuss preliminary report
7.00 PM	Dinner and Review Meeting by Programme Evaluators.
DAY 3	
7.00 AM	Breakfast
8.00 AM	Inspection of relevant supporting documents
9.00 AM	Team meets with students.
10.00AM	Meeting with external stakeholders such as alumni, employers, and industry advisors
12.00 PM	Meeting with HOD, Lecturers, Workshops & Laboratories staff to discuss observation(s).
1.00 PM	Lunch
2.00 PM	Inspection of relevant documents and interaction with Stakeholders continues
4.00 PM	Inspection of relevant documents and interaction with stakeholders concluded.
5.00 PM	Team prepares Final Report on the Programme and makes final assessment. Completed questionnaires and final assessments are submitted to the Team Leader.
7.00 PM	Dinner
DAY 4	
7.00 AM	Breakfast
9:00 AM 10;00 AM	Team visits Vice Chancellor for preliminary report /Exit meeting. Departure

2.16 REPORT AND RECOMMENDATIONS

The report, prepared in accordance with Programme Evaluators' Guidelines, by the Accreditation Team shall be submitted to EAC secretariat immediately after the visit.

2.17 STRUCTURE OF ACCREDITATION FEE AND EXPENSES

The Institution shall bear all the costs incurred for carrying out activities related to the approval and accreditation of a programme. This should be paid to COREN before the commencement of the accreditation process. Additional cost shall be incurred for postponement of accreditation exercise.

Please, note that the fee for various types of accreditations visit and other issues (i.e. Accreditation, Re-Accreditation, Pre-Accreditation, Resource Verification, Change of Scope, and Appeal cases) shall be as prescribed by COREN from time to time.

Note: Please refer to COREN Headquarters/website www.coren.gov.ng for the current fee structure/policy for the various types of assessment visit.

CHAPTER 3

CRITERIA FOR ACCREDITATION

3. CRITERIA FOR ACCREDITATION

3.1 INTRODUCTION

The following criteria are used to assess an engineering programme by the EAC:

Criterion 1 - Programme Educational Objectives (PEOs)
Criterion 2 - Programme Outcomes (POs)
Criterion 3- Course Learning Outcomes (CLOs)
Criterion 4 - Curriculum and Learning Process
Criterion 5 - Students
Criterion 6 –Continuous Quality Improvement
Criterion 7 - Staffing
Criterion 8 - Physical Facilities and Infrastructures
Criterion 9 - Institutional Linkage and Community Service
Criterion 10 - Institutional Support and Funding

3.2 ACCREDITATION CRITERIA

Each criterion serves to assess a principal feature of the institutional activities and overall programme's effectiveness. Hence, each of them is described in terms of quality attributes amenable to a substantially objective and qualitative assessment.

3.2.1 Criterion 1- Programme Educational Objectives (PEOs)

Programme Educational Objectives (PEOs) for each engineering degree programme address the expectations of stakeholders. They should be consistent with the vision and mission of the university. The number of PEOs should be manageable (3 - 5), and they should be specific, measurable, realistic and achievable within reasonable time frame. Programme Educational Objectives (PEOs) are attributes expected of graduates of the engineering programme between 3 – 5 years after graduation. PEOs should be developed for each engineering programme by taking into consideration, as much as possible, inputs from external and internal stakeholders such as Federal, State and Local Governments, some relevant industries, alumni, employers, students, parents, lecturers and university administration.

The aim of running any engineering programme is to produce graduates with high academic and ethical standards, adequate soft skills and practical exposure thereby making

them suitable candidates for self-employment, and employment in public service or in the organized private sector.

For each engineering programme to be accredited, the following are expected:

(a) Well-defined and published Programme Educational Objectives;
(b) PEOs consistent with the mission of the institution;
(c) PEOs based on the stakeholders' needs;
(d) A process in place to evaluate the attainment of PEOs; and
(e) A mechanism in place for using evaluation results for continually improving the programme.

Note: Since the data related to the level of attainment of the PEOs are not available for the graduates of a programme which is being accredited for the first time, or the one which is in the initial phases of its accreditation (e.g., whose only one/two batches have graduated so far), (e) above is not required for a programme in this category.

3.2.2 Criterion 2– Programme Outcomes (POs)

The Programme Outcomes state the knowledge, skills and attitudes that students are expected to have at the time of graduation from the degree programme. Specifically, the programme should demonstrate that the students have acquired the Graduate Attributes associated with the corresponding Knowledge Profile (K1 – K9) POs as indicated in Annex A. These are adopted from IEA updated list of graduate attributes.

A graduate of an engineering programme to be accredited by EAC is expected to have ability to exhibit the attribute listed in the table below.

Characteristic	Programme Outcome (Engineer Graduate Profile)
Engineering Knowledge: Breadth, depth and type of knowledge, both theoretical and practical	PO1: Apply knowledge of mathematics, natural science, computing and engineering fundamentals, and an engineering specialization as specified in K1 to K4 respectively (see Annex A-2) to develop solutions to complex engineering problems
Problem Analysis, Complexity of analysis	PO2: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences with holistic considerations for sustainable development* (K1 to K4)
Design/development of solutions: Breadth and uniqueness of engineering problems i.e., the extent to which problems are original and to which solutions have	PO3: Design creative solutions for complex engineering problems and design systems, components or processes to meet identified needs with appropriate consideration for public health and safety, whole-life cost, net zero carbon as well as resource, cultural, societal, and environmental considerations as required (K5)

not previously been identified or codified	
Investigation: Breadth and depth of investigation and experimentation	PO4: Conduct investigations of complex engineering problems using research methods including research-based knowledge, design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions (K8)
Tool Usage: Level of understanding of the appropriateness of technologies and tools	PO5: Create, select and apply, and recognize limitations of appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems (WK2 engineering and K6)
The Engineer and the World: Level of knowledge and responsibility for sustainable development	PO6: When solving complex engineering problems, analyze and evaluate sustainable development impacts* to: society, the economy, sustainability, health and safety, legal frameworks, and the environment (K1, K5, and K7)
Ethics: Understanding and level of practice	PO7: Apply ethical principles and commit to professional ethics and norms of engineering practice and adhere to relevant national and international laws. Demonstrate an understanding of the need for diversity and inclusion (K9)
Individual and Collaborative Team work: Role in and diversity of team	PO8: Function effectively as an individual, and as a member or leader in diverse and inclusive teams and in multi-disciplinary, face-to-face, remote and distributed settings (K9)
Communication: Level of communication according to type of activities performed	PO9: Communicate effectively and inclusively on 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, taking into account cultural, language, and learning differences.
Project Management and Finance: Level of management required for differing types of activity	PO10: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
Lifelong learning: Duration and manner	PO11: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change (K8)
*Represented by the 17 UN Sustainable Development Goals (UN-SDG)	

An Engineering programme which targets the development of the above-mentioned attributes in its graduates must ensure that its curriculum encompasses all the desired elements of ***Knowledge Profile*** as given in Table A-1. The range of ***Complex Problem Solving*** and ***Complex Engineering Activities*** are given in the Tables A-2 and A-3 respectively. These Tables are Annex A.

The following must be in place for the programme considered for accreditation:

(a) Well-defined and published POs
(b) Mapping of POs to PEOs
(c) Teaching-learning and assessment methods appropriate and supportive to the attainment of POs are in place.
(d) There is good quality of assessment mechanism to evaluate achievement levels for all the Programme Outcomes by each student.
(e) Process is in place by which assessment results are applied to further refine the assessment mechanism and/or redefine the programme outcomes, thus leading to continuous improvement of the programme.

3.2.3 Criterion 3– Course Learning Outcomes (CLOs)

The programme must ensure that each student has achieved all POs to acceptable level through assessment of CLOs. The appropriateness of the assessment methods along with the level of achievement against the targeted outcomes must be evaluated. Mapping of Programme Outcomes to individual courses, nature of assessment tools (direct/indirect/rubrics) and the process of evaluation to determine the attainment of POs should be demonstrated through reasonably convincing evidences.

In particular, the programme must demonstrate the following:

(a) Well-defined and published CLOs
(b) Mapping of CLOs to POs
(c) Teaching-learning and assessment methods appropriate and supportive to the attainment of CLOs.
(d) Quality of assessment mechanism to evaluate achievement levels for all the CLOs by each student.
(e) Process in place by which assessment results are applied to further refine the assessment mechanism and/or redefine the CLOs, thus leading to continuous improvement of the programme.

3.2.4 Criterion 4–Curriculum and Learning Process

The academic curriculum and curricular design shall strongly reflect the philosophy and approach adopted in the programme structure, and the choice of the teaching-learning (delivery) and assessment methods. The curricular approach, the educational content and the teaching-learning and assessment methods shall be appropriate to, consistent with, and support the attainment or achievement of the Programme Outcomes. Adequate experimental work should be done in the laboratories to complement the theoretical topics covered in the lectures.

In developing the curriculum, the input of all stakeholders should be given careful consideration, especially stakeholders from industry so that the curriculum will be well aligned with the expectation of the industries relevant to that engineering programme. The courses taken and the examination questions given to the students should progressively cover higher levels of Bloom's taxonomy as the students proceed to higher levels in their degree programme.

The programme should be offered as a 5-year, 10-semester programme. Minimum Fifteen (15) weeks of teaching, excluding time of examination(s), in a regular First and Second-semester is mandatory.

The curriculum requirements specify subject areas appropriate to engineering and non-engineering courses. The programme curriculum must provide adequate content for each area, consistent with the Programme Outcomes and Programme Educational Objectives, to ensure that students are prepared to enter the practice of engineering. The curriculum must include:

(a) A minimum of 30 semester credit hours (or equivalent) of a combination of college-level mathematics and basic sciences with experimental experience appropriate to the programme.
(b) A minimum of 85 semester credit hours (or equivalent) of engineering topics appropriate to the programme, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools.
(c) A broad education component that complements the technical content of the curriculum and is consistent with the Programme Educational Objectives.
(d) A culminating major engineering design experience that:

i. incorporates appropriate engineering standards and multiple constraints, and
ii. is based on the knowledge and skills acquired in earlier course work.

Comprehensive pursuance of a curriculum necessitates that all of its related activities should be allocated time intervals as per a well-defined reference. In semester system of education, this reference is "Credit-Hour". One credit hour is defined as:

1) One contact hour per week for theory classes (it does not take into account any independent study time).
2) Three contiguous contact hours per week of supervised lab work.
3) Three hours per week related to final year project, including meeting with the supervisor.

Evidence shall be present to show that the curriculum contents are being updated to keep up with the scientific, technological and knowledge development in the field, and to meet the needs of society.

In addition, an Engineering Programme should demonstrate the following essentials:

- **Internship Programme**

Provision should be made for the students to undergo some months of supervised industrial training in ~~some~~ engineering relevant industries during their degree programme. The training programme should have been planned and agreed to between the institution and the host organization. Details of daily activities during the industrial training recorded in a log book by each student and must be endorsed by a supervisor in the industry appointed for the student. The student shall also write a report at the end of each industrial training period to be submitted and defended in an oral examination after returning to the institution. The institution should receive report about each trainee indicating the training details, interest shown by the student; his/her work habits and punctuality. Specifically, as indicated in the COREN BMAPS, the following are the requirements for conducting acceptable IT/SIWES work:

a) Each programme should have a minimum of six months IT/SIWES.
b) Faculties are expected to have SIWES-I (9 Weeks), SIWES-II (12 Weeks) and SIWES-III (12 Weeks) after 200, 300 and 400 Levels respectively.
c) All industrial training programmes must be fully complied with, irrespective of strikes or other interruptions to the academic calendar.
d) Industrial training placement for engineering students must be in engineering companies and firms, factories, workshops and other engineering-based organizations where students can have adequate engineering experience.
e) Students on industrial training must be visited by lecturers at least once over a period of three months and other means of mentoring deployed. This may include but not

limited to phone calls – either voice note or video calls, sharing of emails with the paganizations HR / Engineering lead / head etc.

f) Adequate number of full-time Industrial Coordinators should be available in the Industrial Coordination office (at least one for two engineering programmes). Such persons appointed as Industrial Coordinators for engineering programmes must be engineers with good industrial experience relevant to the disciplines they are to coordinate, and they must also be registered by COREN. Letters of appointment into such roles or emails within the department or facilities should be made available for sighting during this exercise clearing stating the criterion for selection of this coordinating lectures.

Laboratory Work/ Workshop Practice

Through the practical work that students do in the laboratories and workshops, they develop skills in psychomotor domain. They also learn to relate what they learn in theory to what they observe during experimental work. The number and variety of experiments should be adequate, and the laboratories and workshops should be well stocked with appropriate equipment, hand tools, machine tools, instruments and instrumentation systems. Manuals containing all experiments for the degree programme should be made available to each student. While taking laboratory courses, students should be given some opportunities to come up with their experimental design ideas, demonstrate their ability to carry out investigation and solve complex engineering problems. This will involve exposing them to open-ended labs and problem-based learning.

- **Design Project(s)**

In order to enhance their ability to solve complex engineering problems, the students of an engineering programme must be encouraged to undertake design projects as an integral part of every core subject. Giving students such mini projects in some of their courses will help them develop their competitive ability, resourcefulness and intuition. Active participation in inter-university design competitions, usually organized on the platform of student chapters of professional associations, should be encouraged because it provides opportunities for the students to use their creativity, ingenuity, ability to work in teams and innovative ability.

- **Final Year Projects**

A final year project gives students opportunity to bring together ideas from several courses taken earlier or currently being taken with some if the experiences gotten from the industries during their IT programs at the different IT stages they undergone, to solve

engineering problems. It is the convergence of an engineering programme. It includes literature search, individual analysis, design and putting together various hardware, software and firmware modules to demonstrate a functional concept.

Design projects should include complex engineering problems. A good final year project should lead to an integration of the knowledge and practical skills gained by the student over the years. Projects of interdisciplinary nature are most appropriate. A final year project may be a group project or a project for an individual student, and it should last for two consecutive semesters and carry a minimum of six credit hours.

3.2.5 Criterion 5- Students

Admitting students who meet the requirements specified by the NUC and COREN ensures that students of the right calibre who can cope well with the degree programme have been brought in. Monitoring and evaluating their performance in the programme help in determining the extent of attainment of the stated programme outcomes by the students. Students must be advised regarding curriculum and career matters. The programme must have and implement policies for accepting students transferring from other universities, awarding appropriate academic credit for courses taken at other institutions.

Students should not be overburdened with workload that may be beyond their ability to cope with. Therefore, a manageable number of courses should be taken by students in each semester. The programme must have and enforce procedures to ensure and document that students who graduate meet all graduation requirements. Adequate opportunities for involvement in co-curricular and extra-curricular activities such as student clubs, sports and religious and social activities on campus, should be provided for students to develop their character and inter-personal skills, apart from academic development.

The programme should comply fully with guidelines on admission criteria, annual intake, transfer of students, class sizes for theory and practical courses and semester academics load as stated in the COREN BMAPS. **The Programme should provide evidence for the implementation of these guidelines in the Self-Study Report to be submitted for accreditation exercises.**

3.2.5.1 Academic Counselling

There should be at least one academic staff appointed for each level (cohort), usually called Level Advisers, to give counselling to students on academic matters. The office hours during which students can be attended to by these Level Advisers should be publicized by posting them on the office doors, noticeboards or level social media platforms. Sessions for tutorials should be properly scheduled and reflected on the timetable. A mechanism should be put in place to monitor the progress of each student so that students who are

academically deficient and would need extra assistance to cope with their studies, can be given adequate attention through remedial classes.

3.2.5.2 Career and Student Guidance & Counselling

Apart from Level Advisers mentioned above, students should have access to well trained counsellors who can advise the students on academic, career, financial, health, social, emotional, family and spiritual matters. During orientation programme organized for new students, they should be made aware of these counselling services which are available to them.

3.2.5.3 Completion of Courses and Student Feedback

Each course taken by a student should be well covered in terms of breadth and depth. All the experiments planned for each semester should also be well covered. Information on the schedule of topics to be covered each week, the different types of formative assessment and the dates scheduled for them and schedule of laboratory experiments during the semester should be made available in the course file.

One of the important documents that should be in the Evidence Room during accreditation visitation is the course file for each course taught in the department. By looking at the course file for a particular course one can detect how well the course was taught. A course file must be available for every course taught in an engineering programme. A course file contains the following.

- Course description including course contents, recommended textbooks, lecture breakdown, office hours for students, CLOs with taxonomy levels and their mapping to POs, Assessment tools and their weight age, grading policy, etc.
- Schedule of mid-term tests, final examination and submission of mini project for the course (if any).
- Samples of best, worst and average answer sheets, along with the question paper and model solutions of each midterm test, quiz, assignment and final examination.
- Record of make-up classes for any public holiday that coincides with scheduled lectures.
- Breakdown of laboratory experiments pertaining to the course and record of successful conduct.
- Record of CLOs and POs assessment and attainment
- Lecturer's course feedback form
- Recommendation and suggestions related to the course for the next session. (Course Report)

3.2.5.4 Participation in Competitions

Higher educational institutions should encourage their students to participate in national and international exhibitions and competitions. Exposure to such competitions against students from other universities broadens the horizons of students and helps to boost their confidence especially if they win any prize; it also gives lecturers opportunity to benchmark their programme against the programmes run by other universities. Evidence of participation in such competitions should be provided to programme evaluators who come for accreditation.

3.2.5.5 Student Performance Evaluation

The different methods used for assessing the performance of students in the various courses they take are of interest here. It is necessary to consider how suitable these methods are for assessing the level of achievement of Course Learning Outcomes. There may be need to review oral and written examinations, class assignments, quizzes, research topics, as well as laboratory and workshop practice projects. The number and variety of such assessment tools and their coverage of subject topics in a manner which ensures a reasonably accurate assessment of students' level of achievement against various learning outcomes is the key to monitor students' progress in a direct manner. It is expected that the programme should demonstrate a minimum number of such class assignments, quizzes and examinations for assessing the level of attainment of the POs relevant to the course

3.2.6 Criterion 6–Continuous Quality Improvement

The programme must regularly use appropriate, documented processes for assessing and evaluating the extent to which the Programme Outcomes are being attained. The results of these evaluations, as well as that of the PEOs and CLOs must be systematically utilized as input for the continuous improvement of the programme. Other available information may also be used to assist in the continuous improvement of the programme.

In addition, various steps taken for improvement of programme quality and the steps taken in the light of the observations of last accreditation visit must be clearly stated and documented.

Information should be provided on the Quality Management System put in place by the institution. It should be noted that planning, implementation, monitoring, and improvement are the essential elements of a Quality Management System. The recommendations on quality improvement of the degree programme from the Director, Quality Assurance Unit and the Director of Academic Planning Unit and how well those

recommendations have been implemented should be clearly stated. These two documents should be provided:

i. Self-Study reports based on Surveys and feedback from the stakeholders; and
ii. Report of implementation plan based on the observations of last accreditation visit and the remedial actions taken by the programme.

The institution is expected to identify employers of their graduates and ask them to evaluate their performance in terms of meeting the needs of the industry. The industry is expected to carry out an independent review of the overall academic standard of the programme in relationship with the industrial outcomes. The report of employers' rating of graduates and feedback from the industry shall be used for continuous quality improvement of the Programme.

3.2.7 Criterion 7– Staffing

The programme must demonstrate that the staff members are of sufficient number and they have the competencies to cover all of the curricular areas of the programme. A viable engineering programme is expected to comply with COREN's criteria for the minimum number of dedicated programme staff members. Sufficient staff for the Programme helps to accommodate adequate levels of student-staff interaction, student advising and counselling, university service activities, professional development, and interactions with industrial and professional practitioners, as well as employers of students.

The programme staff must have appropriate qualifications and demonstrate sufficient ability to ensure the proper guidance of the programme and to develop and implement processes for the evaluation, assessment, and continuing improvement of the programme. The overall competence of the academic staff may be judged by such factors as: education, diversity of backgrounds, engineering experience, teaching effectiveness and experience, ability to communicate, enthusiasm for developing more effective Programmes, level of scholarship, participation in activities of professional societies, and license to practice as an Engineer.

Apart from teaching and carrying out research, a lecturer is expected to serve as: an adviser for students, a mentor for younger lecturers, an academic planner, a curriculum developer, an internal auditor and sometimes an administrator. The lecturers are supposed to understand the outcome-based education system and be able to implement it well. Having a good understanding of the PEOs, POs, CLOs and the outcome-based assessment cycle by the lecturers is essential for the success of the programme.

It is necessary to employ well-qualified lecturers and retain them in the employment of the institution. High turnover of lecturers is detrimental to the smooth running of the department. The welfare of the lecturers should be well taken care of so that they can give

their best in the service of the institution. A mechanism should be used to monitor the performance of each lecturer to ensure that an acceptable level of productivity is maintained.

An Engineering programme in Nigeria is expected to comply with COREN's criteria for Staff Strength, Full time/Shared/Visiting dedicated academic staff, Staff qualification and Student/Staff ratio (See the latest edition of BMAPS of COREN).

3.2.7.1 Faculty Training and Mentoring

Training and mentoring lecturers will help them to perform well on the job. There should be systematic activities in place (such as workshops, seminars, conferences, etc.) for giving necessary pedagogical and didactic training to newly employed lecturers within their first year on the job. In addition, from time to time, refresher training programmes on topics identified based on feedback on the performance of lecturers on the job should be organized for all lecturers.

The lecturers should also be given adequate training on outcome-based education system so that they can implement it well and be able to develop processes for assessment, evaluation and continuous quality improvement. The following are some of the topics that should be covered during the OBE training:

- Making learning student centred;
- PEOs, POs and CLOs;
- Outcome-based assessment cycle and its implementation.
- General aspects of lectures delivery;
- Modes and means of effective student-teacher interaction;
- Using quizzes/assignments/exams/projects/viva voce as effective assessment tools;
- Evaluation of assessment results to gauge level of attainment of POs/CLOs; and
- Preparing and maintaining course files.

3.2.7.2 Staff Retention, Development and Career Planning

Adequate provision should be made for lecturers who do not yet have PhD. degree to undergo staff development. To ensure having faculty members with diverse backgrounds and experience from different universities, it is not enough to arrange for only home-based staff development programme. It should be possible for some lecturers to undergo staff development in other universities, especially outside Nigeria. For those who do their master's degree or PhD. research in the department, their workload should be reduced to a reasonable level so that they will be able to complete the programme in a reasonable time.

For career and professional development, there should be provision for lecturers to go for sabbatical leave in other universities or research institutes for them to have opportunities for post-doctoral research, book writing, teaching/research experience in other universities, etc.

The institution should make provisions for competitive staff salaries that are paid regularly, timely promotion, adequate employment security and pension scheme, etc., to motivate staff so that they can give their best in the service of the university. Employment and retention of qualified lecturers is an indication that the management of the institution is committed to attainment of the Programme Educational Objectives of the degree programme. If a high turnover of staff is observed, efforts should be made to remedy the situations causing it as soon as possible.

3.2.7.3 Faculty Research & Publications

The institution should sponsor lecturers to attend national and international academic and professional conferences, workshops, exhibitions, etc., at which they can present their research findings for peer review and give them opportunities to arrange for collaboration with colleagues from other universities, research institutes and industry. They should be encouraged to publish their work in reputable national and international journals by making provisions for supporting them in paying for publication expenses. Provision should also be made for organizing national/international workshops, conferences, seminars, etc., at least occasionally.

Establishment of links with industry for lecturers to provide consultancy services should be encouraged by the institution. Lecturers should be trained in how they can write proposals to attract research and development (R&D) funding from national and international agencies. Members of staff who successfully attract such research grants should be rewarded with financial incentives and reduced teaching and administrative workloads so that they can have enough time to complete such research in reasonable time.

3.2.8 Criterion 8 – Physical Facilities and Infrastructure

The quality of the environment in which the programme is delivered is considered as paramount to providing the educational experience necessary to accomplish the Programme Outcomes. Classrooms, offices, laboratories, and associated equipment must be adequate to support attainment of the Programme Outcomes and to provide an atmosphere conducive to learning. Modern tools, equipment, computing resources, and laboratories appropriate to the programme must be available, accessible, and systematically maintained and upgraded to enable students to attain the Programme Outcomes and to support programmes' needs. Students must be provided appropriate

guidance regarding the use of the tools, equipment, computing resources, and laboratories available to the programme.

The library services and the computing and information infrastructure must be adequate to support the scholarly and professional activities of the students and staff. Support facilities such as hostels, sport and recreational centres, health centres, student centres, and transport must be adequate to facilitate students' life on campus and to enhance character building.

There must be adherence to international standards of health, safety and environment (HSE) in all buildings and facilities on campus. This can be achieved if safety signage and markings, exit signs, fire protection and fire-fighting systems, smoke detector systems, etc., are provided for in the design of the buildings and facilities and they are also well maintained after their commissioning. There should be an institutional HSE policy well publicized among members of staff and students and visitors should be made aware of where necessary. A safety culture should be well established on campus. Personal protection Equipment (PPE) such as goggles, boots, ear protectors, etc., first aid boxes, guards, eye wash, shower, hazardous disposal containers, radiation shields, ventilation equipment for noxious fumes should be provided in laboratories and workshops where needed.

In the Self-Study report prepared for the accreditation of an engineering programme; documentary evidence should be provided for the following:

(a.) Physical master plan of the university campus and available teaching and learning facilities such as classrooms, lecture theatres, auditoria, learning- support facilities (such as audio and video recordings), study areas (reading spaces in the library and faculty buildings), hard and soft copy information resources (library), computing and information-technology systems (internet access to library resources), laboratories, workshops, and associated equipment to cater for multi-delivery modes.

(b.) Adequate available support facilities such as hostels, sports and recreational centres, clinics and hospitals accessible to students, student centres, and transportation systems in facilitating students' life on campus and enhancing character building.

(c.) Documented recent improvements on these facilities as a part of CQI efforts for the programme.

3.2.9 Criterion 9 - Institutional Linkage and Community Service

The institution should encourage linkage of departments running engineering programmes with relevant industries to provide opportunities for lecturers and students to be trained on the use of modern state-of-the-art equipment available in industries.

Lecturers and postgraduate students can also provide consultancy services and collaborate with colleagues in industry on research and development. Colleagues from industry through such linkage can also bring materials for testing and characterization to university laboratories and thereby contribute to internally generated revenues of the institution. The close relationship with industries will facilitate getting the necessary feedback on the alumni of the institution employed in those industries. This feedback from the industry and employers is crucial and an essential part of the curriculum review process used to evaluate attainment of the PEOs.

Members of Staff are expected to have contributed to the development of their immediate community and the nation through community service, projects within and outside the University environment, public lectures, etc.

3.2.10 Criterion 10 - Institutional Support and Funding

This criterion deals with the availability of financial resources to run an engineering degree programme and the commitment of the institution to support the programme. The adequacy of the financial resources made available to run the programme must be assessed so that necessary enhancement of financial support can be recommended. Institutional support and Funding must be adequate to ensure the quality and continuity of the programme. Resources including institutional services, financial support, and staff (academic, administrative and technical) provided to the programme must be adequate to meet programme needs. The resources available to the programme must be sufficient to attract, retain, and provide for the continuing professional development of qualified staff. The resources available to the programme must be sufficient to acquire, maintain, and operate infrastructures, facilities, and equipment appropriate for the programme, and to provide an environment in which POs can be attained.

Programme Evaluators who come for an accreditation visit requires information on income and expenditure which can be extracted from the approved budgets for the programme for the current as well as two previous, but consecutive, financial years. In case of a new Programme, only budgetary figures for one (or two) financial year(s) will suffice. Institution is required to provide copies of the approved budgets and last-year audited accounts.

CHAPTER 4

TEMPLATE FOR COREN SELF-STUDY ASSESSMENT REPORT

4. TEMPLATE FOR SELF- STUDY REPORT

4.1. INTRODUCTION

An institution to be visited for accreditation should provide accurate pieces of information and sufficient evidence in the documents submitted for the use of programme evaluators. Each programme to be visited should submit the following documents:

i. Four hard copies and soft copy of Self-Study Report prepared following the format given below;
ii. Four hard copies and soft copies of Duly completed forms from the annexes provided in this Manual; and
iii. Four hard copies and soft copies of supporting material/documents.

4.2. FORMAT OF SELF-STUDY REPORT

A Self Study Report must be comprehensive, easily readable, freestanding, and provide a coherent overview with the text addressing each major point in a definitive manner. It is an account of the institution's plan, implementation, assessment and evaluation of the programme conducted. In addition, it should be a clear reflection of the processes with results obtained, used in continual quality improvement at all levels of the program's activities. The document must be bound with all pages numbered and a table of contents which provides the information and description about the programme to enable the Evaluation Panel to objectively assess the programme for the purpose of accreditation. The emphasis shall be on qualitative description of each aspect and criterion, and how it meets the standards and expectation as set out in this Manual. In other words, this summary document is a form of Self-Study of the institution's programme and expected to provide accurate information as required by the Accreditation Standard (as detailed in Chapter 3 of this manual).

4.3. THE STRUCTURE OF THE SELF-STUDY REPORT

(a) In the first section of the SSR, provide general information on the institution, specific programme being visited and attach the institution academic calendar.
(b) In the second section, provide detailed information on the programme and history of accreditation (year of accreditation, conditions imposed and actions taken).
(c) In the third section, describe any self-initiated improvements made in the programme and the year the changes were introduced.

4.4. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

(a) State the vision and mission of the institution and/or faculty (School).
(b) Describe the PEOs and state where they are published.
(c) Describe how the PEOs are consistent with the vision and mission of the institution and/or faculty/School and stakeholders' requirements.
(d) Describe the processes used to evaluate the achievement of PEOs.
(e) Describe how the results obtained from evaluation are being used to improve the effectiveness of the programme.
(f) Describe the processes used to evaluate the level of achievement of the PEOs. This includes describing graduate's/alumni database, tools (survey, meetings, interviews, etc.) and frequency of activities and timelines.
(g) Discuss the PEOs achievement results by the graduates/alumni.
(h) Describe how the feedback and results obtained from the above processes are being used for the CQI of the programme.
(i) Describe the extent to which the programme's various stakeholders are involved in these processes.
(j) Describe CQI strategies to be implemented in relation to PEOs.

4.5. PROGRAMME OUTCOMES (POs)

a) List the POs and state where they are published.
b) Describe how the POs relate to PEOs (in addition to the template given in **Annex B-1).**
c) Describe how the POs encompass and are consistent with the POs of Section 3.2.2 of this Manual.
d) Describe the PO definition or elements/performance indicators.
e) Describe the processes used to establish and review the POs, and the extent to which the programme's various stakeholders are involved in these processes (where applicable). This includes describing the tools used in the processes (survey, meetings, interviews, etc.) and frequency of activities and timelines.
f) Describe the mapping of courses with POs (as per template given in **Annex-D**).
g) Explain how the assessment results are applied to further develop and improve the POs.

h) Describe the materials, including student work and other evidence, that demonstrate achievement of the POs.
i) Describe the extent to which the programme's various stakeholders are involved in the processes.
j) Describe CQI strategies to be implemented in relation to POs.

4.6. CURRICULUM AND LEARNING PROCESS

(a) Discuss the programme structure and course contents to show how they are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the POs.
(b) Discuss the programme delivery and assessment methods and show how these are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the POs.
(c) Provide evidence of the use of tutorials and non-conventional delivery methods such as Problem Based Learning (PBL) techniques alongside traditional lectures.
(d) Describe how the requirements of Complex Problem Solving (CPS) and Complex Engineering Activities (CEA) have been addressed.

The information required in **(a) and (b)** should include but is not limited to the following:

- A matrix linking courses to POs to identify and track the contribution of each course to the POs (as per template given in **Annex-D**).
- Distribution of the engineering courses according to areas specific to each programme (as per template given in **Annex-E**).
- Distribution of the related non-engineering (general education) courses.
- Distribution of the courses offered according to semester (as per template given in **Annex-F**).
- Details of Laboratory equipment/workstations and experiments conducted (as per template given in **Annex-G**).

4.7. STUDENTS

The information required in this section should include relevant templates given in Annexes, where applicable.

(a) Discuss the requirement and process for admission of students to the program, response and annual in-take (as per template given in **Annex-H**).
(b) Discuss the policies and processes for students' transfer and credit transfer/exemption.
(c) Discuss mechanism for providing guidance to students on academic, career and aspects pertaining to wellness.

(d) Discuss students' workload, class sizes for theory as well as laboratory sessions and completion of courses.
(e) Describe formal or informal feedback platform/channel to obtain students feedback and suggestions for further programme improvement, and how have the feedback resulted in programme improvement.
(f) Summarize the graduation requirements for the programme, the process for ensuring and documenting that each graduate completes all graduation requirements for the programme (as per template given in **Annex M**).
(g) Describe CQI strategies to be implemented in relation to Students.

4.8. CONTINUOUS QUALITY IMPROVEMENT

(a) Discuss the mechanism for: programme planning; curriculum development; curriculum and content review; responding to feedback and inputs from stakeholders including industry advisors, students and alumni; tracking the contribution of individual courses to POs; tracking outcomes of performance through assessment, including rubrics; reviewing of PEOs and POs; and continuous quality improvement. For a new programme, the institution also needs to discuss the processes for the decision to introduce the programme.
(b) Discuss the implementation plan based on the observations of the last accreditation visit and the remedial actions taken.

The information required in **(a) and (b)** should include but is not limited to the following:

- Evidence on the participation of faculty members and support staff as well as students in the continuous quality improvement process.
- Evidence on the development of academic staff through opportunities in further education, industrial exposure, as well as research and development.
- Policies, internal processes and practices that are in place at all levels within the institution relating to the accreditation criteria as stated in Chapter 3 of this Manual.

(a) Summarize responses to the external examiner's report.
(b) Discuss how the quality management system of the institution provides quality assurance and benchmarking.
(c) Evidence of the on-going participation of industry advisors in discussions and forums, professional practice exposure, and collaborative projects.
(d) Provide at least ten (10) employers' feedback report on the performance of students who graduated within the last five (5) years.

4.9. STAFFING

The information required in this section should include relevant templates given in annexes, where applicable.

(a) Discuss the strength and competencies of the academic staff in covering all areas of the program, and in implementing the outcome- based approach to education (as per template given in **Annexes-I~K**).

(b) Discuss how the overall staff work load enables effective teaching (including student-teacher ratio), student-staff interaction, student advising and counselling, institutional service and research activities, professional development and interaction with industry.

(c) Discuss processes for faculty development, training and retention.

(d) Describe the role played by the faculty with respect to course creation, modification, and evaluation, their role in the definition and revision of Programme Educational Objectives and Programme Outcomes, and their role in the attainment of the Programme Outcomes. Describe the roles of others on campus, e.g., dean or provost, with respect to these areas.

(e) Discuss the sufficiency and competency of technical and administrative staff in providing adequate support to the educational programme. These include:

- A breakdown in terms of numbers of teaching staff (full- time, part-time and inter-programme) by year for the past five years
- A summary of the academic qualifications of teaching staff.
- A summary of the professional qualifications and membership in professional bodies/societies of teaching staff.
- A summary of the posts held by full time teaching staff.
- A summary of teaching workload of teaching staff for the current semester.
- An analysis of all support staff and post held in the Department.
- The staff: student ratio by year for all academic years for the past five years.
- A list of lecturers/invited speakers from industry/public bodies and their level of involvement.

Outline the organizational structure of the institution as well as the structure within the faculty/department/programme. Discuss the level and adequacy of institutional support, operating environment, financial resources, constructive leadership, policies and mechanisms for attracting, appointing, retaining and rewarding well qualified staff and provision of professional development, and provision of infrastructure and support services to achieve Programme Educational Objectives and assure continuity of the programme. All relevant policies are to be made available during the visit.

4.10. PHYSICAL FACILITIES AND INFRASTRUCTURE

(a) Discuss the adequacy of teaching and learning facilities such as classrooms, learning-support facilities, study areas, information resources (library), computing and information-technology systems, laboratories and workshops, and associated equipment to cater for multi-delivery modes.

(b) Describe the adequacy of support facilities such as hostels, sport and recreational centres, health centres, student centres, and transport in facilitating students' life on campus and enhancing character building.

The information required in **(a) and (b)** should include but is not limited to the following:

- A summary, in tabulated form, of the lecture facilities (give number, capacity, and audio/video facilities available).
- A summary, in tabulated form, of the laboratories (list the details of workstation available in each laboratory).
- A summary, in tabulated form, of the workshops/drawing studio (list the equipment/machinery available in each workshop/drawing studio).
- A summary, in tabulated form, of the computer laboratories (list the hardware and software available).
- A summary, in tabulated form, of recreational facilities.
- A summary, in tabulated form, of information on recent improvements and planned improvements in these facilities.

4.11. INDUSTRIAL LINKAGES AND COMMUNITY SERVICE

Of interest here is the involvement of industry in discussions on professional practice exposure, and collaborative projects/ research for the solutions to engineering problems. Discuss students' activities and involvement in student organizations that provide experience in management and governance, representation in education and related matters and social activities.

4.12. INSTITUTIONAL SUPPORT AND FUNDING

Discuss the strategies used for the employment and retention of staff for the programme. Discuss institution's financial commitment and support to sustain and enhance the quality of programme. Also summarize the salient features in a tabular form (as per the template given in **Annex-L**).

4.13. INSTITUTIONAL DOCUMENTS TO BE MADE AVAILABLE

The institution should make available the following items as evidence to support the information provided in the Self-Study Report during the visit:

(a) The Handbook, Calendar supplement, or other official publication relating to the faculty/school/department and containing the statement of programme details; Institution prospectus.

(b) All relevant documents and evidence related to Programme Educational Objectives and Programme Outcomes (one copy) as follows:

- Course files – for every course offered by the programme, provide the course information to include the targeted course learning outcomes, a matrix linking course outcomes to programme outcomes, course synopsis/syllabus, and a list of references (texts used).
- Examination questions, Booklets and Marking Schemes. Any information about other learning activities and assessment measures such as projects, quizzes, tutorial questions, assignments, class projects, copies of the course notes (optional), and any other materials used for the course are also to be included. For laboratory courses, provide a copy of the syllabi, experiment instruction sheets, as well as supporting information.
- Documents related to training workshops on OBE and Curriculum development.
- Objectives and outcomes assessment instruments–supporting documents for objectives and outcomes assessment including sample questionnaires, portfolios, survey forms, video recordings, etc.
- Copies of the final year project report, instruction sheets, and grade sheets or other evaluations for the project. A list of final project titles for the past 2 years.
- Copies of the training reports, guidelines for the training, and reviews of PEOs by the industry as well as the staff mentors.
- Copies of the laboratory instruction sheets and reports, grade sheets or other evaluations for the project laboratory report.
- Evidence of students' evaluation of staff.
- A bound copy of the overall students' results for each semester and overall graduating students' spreadsheet.
- Minutes and records of action and improvement of meetings of the programme teaching team, Industry Advisory Committee, staff-student consultation fora.
- Documents related to students' participation in design competition, public speaking activities, etc.
- Documents related to academic staff attending trainings, conferences and workshops.

- Facilities and equipment maintenance records with Equipment calibration records.
- Evidence of activities relevant to industry exposure with a summary of the industrial training schemes, and the list of companies involved.
- Documents related to health, safety, and environment.
- Institution/programme annual report.
- External examiners' reports.
- A **Three-page CV** for each staff member in Annex.

ANNEXES

ANNEX A: KNOWLEDGE PROFILE AND DEFINITION OF COMPLEX ENGINEERING PROBLEM

Annex A-1: Knowledge Attribute Profile

The curriculum shall encompass the knowledge profile as summarised in the table below:

TableA-1: Knowledge Attribute Profile

S/No.	Attribute
K1	A systematic, theory-based understanding of the **natural sciences** applicable to the discipline and awareness of relevant **social sciences**
K2	Conceptually-based **mathematics**, numerical analysis, data analysis, statistics and formal aspects of computer and information science to support detailed analysis and modelling applicable to the discipline
K3	A systematic, theory-based formulation of **engineering fundamentals** required in the engineering discipline
K4	Engineering **specialist knowledge** that provides theoretical frameworks and bodies of knowledge for the accepted practice areas in the engineering discipline; much is at the forefront of the discipline
K5	Knowledge, including efficient resource use, environmental impacts, whole-life cost, re-use of resources, net zero carbon, and similar concepts, that supports **engineering design and operations** in a practice area.
K6	Knowledge of **engineering practice** (technology) in the practice areas in the engineering discipline
K7	**Knowledge of** the role of engineering in society and identified issues in engineering practice in the discipline, such as the professional responsibility of an engineer to public safety and sustainable development*
K8	Engagement with selected knowledge in the current **research literature** of the discipline, awareness of the power of critical thinking and creative approaches to evaluate emerging issues

K9	**Ethics, inclusive behaviour and conduct**. Knowledge of professional ethics, responsibilities, and norms of engineering practice. Awareness of the need for diversity by reason of ethnicity, gender, age, physical ability etc. with mutual understanding and respect, and of inclusive attitudes

*Represented by the 17 UN Sustainable Development Goals (UN-SDG)

Annex A-2: Definition of Complex Problem Solving

The range of complex problem solving is defined as follows:

Table A-2: Range of Complex Problem Solving

Attribute	**Complex Engineering Problems** have characteristic P1 and some or all of P2 to P7:
Depth of Knowledge Required	P1: Cannot be resolved without in-depth engineering knowledge at the level of one or more of K3, K4, K5, K6 or K8 which allows a fundamentals-based, first principles analytical approach
Range of conflicting requirements	P2: Involve wide-ranging and/or conflicting technical, non-technical issues (such as ethical, sustainability, legal, political, economic, societal) and consideration of future requirements
Depth of analysis required	P3: Have no obvious solution and require abstract thinking, creativity and originality in analysis to formulate suitable models
Familiarity of issues	P4: Involve infrequently encountered issues or novel problems
Extent of applicable codes	P5: Address problems not encompassed by standards and codes of practice for professional engineering
Extent of stakeholder involvement and conflicting requirements	P6: Involve collaboration across engineering disciplines, other fields, and/or diverse groups of stakeholders with widely varying needs
Interdependence	P7: Address high level problems with many components or sub-problems that may require a systems approach

Annex A-3: Definition of Complex Engineering Activities

The range of complex engineering activities is defined as follows:

Table A-3: Range of Complex Engineering Activities

Attribute	**Complex Activities**
Preamble	**Complex activities** mean (*engineering*) activities or projects that have some or all of the following characteristics:
Range of resources	A1: Involve the use of diverse resources including people, data and information, natural, financial and physical resources and appropriate technologies including analytical and/or design software
Level of interactions	A2: Require optimal resolution of interactions between wide-ranging and/or conflicting technical, non-technical, and engineering issues
Innovation	A3: Involve creative use of engineering principles, innovative solutions for a conscious purpose, and research-based knowledge
Consequences to society and the environment	A4: Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation
Familiarity	A5: Can extend beyond previous experiences by applying principles-based approaches

ANNEX B: MAPPING OF PEOs TO POs/GRADUATE ATTRIBUTES

Annex B-1: Mapping of POs to PEOs (Sec3.2.2)

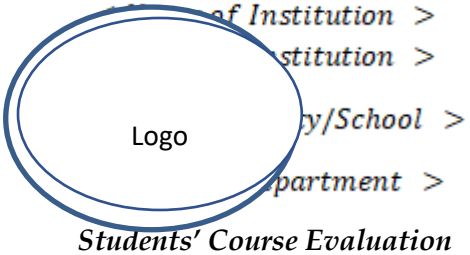
COREN Programme Outcomes (as defined in Sec. 3.2.2)	PEO 1	PEO2	PEO 3	PEO 4	……
PO1					
PO2					
PO3					
…….					
…….					
…….					
…….					
…….					

Annex B-2: Mapping of CLOs to POs (Sec3.2.2)

Course Learning Outcomes (as defined by the Programme in courses)	Program Outcomes as defined by COREN (more may be added by the Programme)										
Course 1	1	2	3	4	5	6	7	8	9	10	11
CLO-1											
CLO-2											
…….											
Course 2											
CLO-1											
CLO-2											
…….											

Annex B-3: Course Evaluation Form

Indirect Evaluation of CLOs in the Course Evaluation File



Students' Course Evaluation Questionnaire

Course Code: CHE 412
Course Name: Transport Phenomena III

Session- Semester: 2017/2018 - First

The questionnaire should be filled by each student at the time of course completion.

Please give us your views so that the quality of this course can be improved. You are encouraged to be candid in your answers. Any information you share here will be kept confidential.

Course Learning Outcomes

For each Learning Outcome listed below, please choose the one response that most accurately represents your view, where:

1 = Strongly Disagree

2 = Disagree

3 = Not Sure

4 = Agree

5 = Strongly Agree

I was able to attain the following learning outcomes for this course:

CLO1: explain the basic principle of con
CLO2: apply equations for solving cond transfer areas
CLO3: discuss dimensional analysis and
CLO4: calculate heat transfer coefficient
CLO5: apply Kirchhoff's and Stefan's equ
CLO6: identify different types of boiling coefficients.

Suggestion:

Suggestion:

ANNEX C: SYSTEM OF INSTRUCTIONS AND EXAMINATION

Session/Semester: _____

Duration of a Session (in weeks) **Total:**_____ **Teaching:**_____

Total No. of courses in the Program: _____

No. of courses in a session: **Min.**_____ **Max.**_____

Total contact-hours for a Theory course per session: _____

Total contact-hours for a Practical course per session: _____

Weekly contact-hours for a Theory class:

Weekly contact-hours for a Practical class:____

Attach Academic Calendars (for Current & the previous years):

Attach Grade-Sheets for LAST ONE-year (All Batches) as per the following format:

Grade -Sheet

		No. of Students Securing Grades (or % Ranges, i.e.<40,40-44,45-49,50-60,60-69,>70)						
Course Code	Course Name	Total	A	B	C	D	E F D+ D	F

ANNEX D: MAPPING OF COURSES TO POs

Semester No.	Course Code	Course Title	Level of Emphasis of PO (1: High;2=Medium; 3=Low)										
			1	2	3	4	5	6	7	8	9	10	..
			POs as defined by COREN (more may be added by the Programme)										
1	MT10001	Calculus											
	HU1021	English Grammar				1							
		Subject 3					2						
		Subject 4											
		Subject 5											
		Subject 6		3									
2	CE1052	OOPS											
		Subject 2											
		Subject 3											
		Subject 4		3									
		Subject 5											
:													

			1										
:													
						2							
:													
					2		2		2				
		Subject 1											
		Subject 2					2		2				
10		Subject 3	2										
		Subject 4							2			2	
		Subject 5								1			

``ANNEX E: DESIGN OF ENGINEERING CURRICULUM

Domain	Knowledge Area	COREN/NUC Recommended		Institute's ProgrammeBreakup	
		Total Credits	Overall %	Total Credits	Overall %
Non-Engineering	Humanities	As per discipline specific COREN BMAPS guidelines	25% – 40%		
	Management Sciences				
	Natural Sciences				
Engineering	Computing	As per discipline specific COREN BMAPS guidelines	60% – 75%		
	Engineering Foundation				
	Major Based Core (Breadth)				
	Major Based Core (Depth)				
	Inter-Disciplinary Engineering Breadth (Electives)				
	Final Year Design Project	6			
	Industrial Training (SIWES)	2			
	Total	130–138	100%	0	0

ANNEX F: CURRICULUM
Annex F-1: Course Offerings

NOTE: The programme is required to attach the list of Contents for ALL Courses

Semester No.	No.	Course Code	Course Title	Credit - Hours	Knowledge Area	Pre-requisite Courses (if any)
1	1	MAT111	Algebra and Number Theory	3-3	Basic Science	
	2	MAT112	Geometry and Trigonometry	3-3	Basic Science	
	3	PHY 113	General Physics I	3-3	Basic Science	
	4	CHM111	Physical Chemistry I	3-3	Basic Science	
	5	GST110	Use of English I & Library	3-3	General Studies	
	6	GST 104	Introduction to Principles of Economics	2-2		
			Total Credit Hours	**17-17**		
2	1	PHY123	General Physics II	3-3	Basic Science	
	2	PHY126	General Physics III	2-2	Basic Science	
		STA127	Probability II	2-2	Basic Science	

	4	CHM121	Organic Chemistry I	3-3	Basic Science	
	5	CHM191	Practical Laboratory Chemistry I	2-2	Basic Science	
	6	PHY100	Practical Laboratory Physics I	2-2	Basic Science	
			Total Credit Hours	**14-14**		
Semester No.	**No.**	**Course Code**	**Course Title**	**Credit - Hours**	**Knowledge Area**	**Pre-requisite Courses (if any)**
3	1	EET211		3-3	Major Eng. Course	
	2	EET212		3-3	Major Eng. Course	
			Total Credit Hours			
4	1	EET221		3-3	Major Eng. Course	
	2	EET222		3-3	Major Eng. Course	
	3	EET223		2-2	Major Eng. Course	
			Total Credit Hours	**17-17**		
.	1					
.	2					
.			**Total Credit Hours**			

	1					
			Total Credit Hours			
10	1	ENG521				
	2	ENG522				
	3	ENG523				
	4	ENG524				
			Total Credit Hours	**14-16**		

Annex F-2: List of Electives

Area of Specialization/ Options	Sr. No.	Course Code	Course Title	Credit Hours	Knowledge Area	Pre-requisite Courses (if any)
Semiconductors	1					
	2					
	3					
	4					
Power Systems	1					
	2					
	3					
	4					
	5					
Digital Design	1					
	2					
	3					

ANNEX G: LABORATORIES & LABORATORY WORKS

Number of Total Engineering + Computing Courses: _____

Number of Lab Courses: _____

Number of Laboratories: _____

Attach Lab Commitment Charts for each Lab (for current & the previous semester):

Attach List of Experiments and name of Instructor(s) for each Lab-course (for current & the previous semester):

Sr. No.	Name of Laboratory (Staff Names& Qualifications)	Titles of Laboratory Course(s) Conducted in the Lab.	Type(s) of Work stations (No. of each type)	Nature of Experiments	No. of Students per Workstation
1	Communication Systems Lab 1: Mr. Lab Engn. Tech. --HND (Elect) 2: Mr. Lab Asst--OND (Elect) 3: Mr. Lab Attend. --	1-CommunicationTheory 2-Wave Propagation &Antennas 3-Microwave Engineering	1-Analog Communication Trainers(6)	Demonstration	4 to5
			2-Digital Communication Trainers(8)	Demonstration	3 to4
			3-Antenna Trainers(6)	Demonstration	4 to5
			4-Microwave Trainers(4)	Demonstration	6 to7
	Electronics Circuits Lab	1-Circuit Analysis I 2-Circuit Analysis II	Workbenches, each with Power-supply, Signal Generator, Oscilloscope,		

2	1: Mr. Lab Engn.Tech.-- HND (Elect) 2: Mr. Lab Asst--OND (Elect) 3: Mr. Lab Attend. --	3-ElectronicDevices & Circuits 4- Integrated Electronics	Multimeter, Breadboard, Components (14)	Hands-on	2

ANNEX H: STUDENTS

Annex H-1: Student Admissions & Enrolments

Session	Applicants			Total Number of Students Admitted		
	UTME	Direct Entry	Total	UTME	Direct Entry	Total
2014/2015	326	77	403	85	17	102
2015/2016	942	102	1044	80	19	99
2016/2017	875	87	962	78	14	92
2017/2018	491	85	576	82	14	96
2018/2019						

Annex H-2: List of Registered Students in Department of ---------- for the past 5 Sessions

Level	Number of Registered Students				
	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019
100	98				
200	71				
300	66				
400	68				
500	72				
Total	375				

Table H-3: Staff/Student Ratio for the past 5 sessions

SESSION	5	4	3	2	1 (current session)
RATIO					

ANNEX I: STAFFING

Annex I-1: List of Full-Time Departmental Academic Staff

S/ No.	Name	COREN #	Rank	Date of first appointment	Details of Qualifications			Specialization	Experience Teaching (Total)Years	Dedicated / Shared	Credit Hours taught in the Current & Last *Semesters*	
					Degree	Year	Institution				First	Second
1			Professor & HoD		Ph.D.				10(15)	Dedicated	6+3	3+0
					Meng							
					B.Eng.							
2			Professor		Ph.D.				08(10)	Dedicated	6+6	9+0
					Meng							
					Beng							
3			Assoc Professor		Ph.D.				06(10)	Dedicated	3+3	12+0
					Meng							
					B.Eng.							
4			Senior Lecturer		Ph.D.				02(03)	**Shared**	3+9	0+12**(06)***
					Meng							
					B.Eng.							
5			Lecturer I		Ph.D.				0.5(01)	Dedicated	0+0	0+6
					Meng							
					B.Eng.							
6			Lecturer II		Meng				03(03)	**Shared**	0+0	6+9**(09)***
					B.Eng.							
7			Assistant Lecturer		Meng					Dedicated	0+0	12+0
					B.Eng.							

NB: Sort by Rank*Taught to other Departments/Degrees programmes

Annex I-2: List of Shared/Visiting Staff from other Departments/Organizations

S/ No.	Name	COREN #	Rank	Details of Qualifications			Specialization	Department/Organization	Credit Hours taught in the Current & Last Semesters	
				Degree	Year	Institution			MS	BS
1			Professor	Ph.D.				Dept. of Mech. Eng	3+0	3+3
				M.Eng						
				B.Eng.						
2			Associate Professor	Ph.D.					0+3	3+6
				M.Eng						
				B.Eng						
3			Senior Lecturer	Ph.D.					0+0	3+3
				M. Eng						
				B.Eng						

NB: Names to be sorted by Rank

Annex I-3: List of Full-Time Laboratory Technologists

S/ No.	Name	COREN#	Rank	Details of Qualifications			Specialization	Date of first appointment	Laboratory Works Conducted (Contact Hours)	
				Degree	Year	Institution			Current Semester	Last Semester
1			Lab. Tech.	B.Eng					9	12
				HND						
				ND						

Annex I-4: Summary of Academic Staff

Current Academic Session Number of New Staff members employed in the programme since last Accreditation Visit

	Staff Teaching Engineering Subjects				Staff Teaching Non-Engineering Subjects			
	B.Eng	M.Eng Eng	PhD	TOTAL	BEng	M. Eng	PhD	TOTAL
Programme Staff (Dedicated)								
Programme Staff (shared with other programs)								
Shared Staff (from other programmes)								
Visiting Eng. Staff								
GA/RA								

BEng	
MEng	
PhD	

Annex I-5: Scenario at the time of Last Accreditation Visit

Number of Staff members who left the programme since last Accreditation Visit

	Staff teaching Engineering Subjects				Staff teaching Non-Engineering Subjects			
	BEng	M Eng	PhD	TOTAL	B.Eng	MEng	PhD	TOTAL
ProgrammeStaff (Dedicated)								
ProgrammeStaff (shared with other programs)								

BEng	
MEng	
PhD	

Shared Staff (from other programs)								
Visiting Engg. Staff								
GA/RA								

ANNEX J: TEMPLATE FOR SELF-STUDY REPORT (SSR)

COREN < with COREN Logo>

Self-Study Report

for the

<Programme Name>

<Faculty/School Name>

at

<University Name>< with Institution Logo>

<Location>

ANNEX K: STAFF WORKLOAD

List the staff members in the same sequence as listed in ***Staff Strength*** sheet

S/No.	Name	Degree	Current Semester Loading			Last Semester Loading		
			Credit Hours		Course Titles	Credit Hours		Course Titles
			Theory	Practical		Theory	Practical	
		B Eng						
		MEng/PhD						
		B Eng						
		MEng/PhD						
		BEng						
		MEng/PhD						
		B Eng						
		MEng/PhD						
		B Eng						

		MEng/PhD						
		BEng						
		MEng/PhD						
		B Eng						
		MEng/PhD						
		B Eng						
		MEng/PhD						

ANNEX L: INSTITUTIONAL SUPPORT AND FUNDING

Annex L-1: Details of the University Income

S/No.	Source of Income	Current Fiscal-Year	1st Previous Fiscal-Year		2nd Previous Fiscal-Year	
			Budgeted	Actual (as per Audit Report)	Budgeted	Actual (as per Audit Report)
A	Grants from Government/Founder					
B	IGR					
C	Tuition-Fee					

D	.					
E	.					

Annex L-2: Details of the University Expenditure

S/No.	Expenditure Head	Current Fiscal-Year	1stPreviousFiscal-Year		2nd Previous Fiscal-Year	
			Budgeted	Actual (as per Audit Report)	Budgeted	Actual (as per Audit Report)
A	Maintenance of Existing Facilities					
B						
C	.					
D	.					
E	.					

<Institution Logo>

<Name of Institution >

SELF STUDY REPORT

<Complete Name of the Engineering Programme>

<Name of the School/ Faculty/Department>

Submitted to

ENGINEERING ACCREDITATION COMMITTEE

COUNCIL FOR THE REGULATION OF ENGINEERING IN NIGERIA

<Month, Year>

This Page should be on University Letterhead

Please tick:

Accreditation	
Approval of New Programme	

Subject: **SSR for the Programme of<as per the degree nomenclature>**

1. The requirements as per the Check List below to qualify for the process of accreditation under the COREN OBE Manual of Accreditation-2019 have been addressed /verified:

Check List:

S. No.	Qualifying Requirement	Institution Check / Remarks	COREN Check Remarks
i.	A minimum of 160 credit units of which 85 credit units must be core engineering courses offered over a period of five years (10 semesters).		
ii.	Final year project (minimum 6 credit hours)		
iii	Industrial training /SIWES		
iv	Full-time engineering faculty (minimum of 6)		
v	Teaching Staff: student ratio of 1:15 minimum		
vi	External examiner's report		
vii	Programme Educational Objectives and their attainments		
viii	Programme Outcomes and their attainments		

2. The Self-Study Report (SSR) is here by submitted for consideration of EAC, COREN to process for accreditation of the programme of– (name of the programme)

Signature :_____
(Head of the Department)

Date:

Signature:_____
(Dean/ Head of the Institution)

Date:

Note:
Give a summary of the adopted initiatives through appropriate and diverse assessment methods to demonstrate that the programme complies with the Outcome Based Assessment (Programme Educational Objectives and Programme Outcomes reflecting Knowledge profiles, Complex problem solving and Complex Engineering activities as indicated in Tables 1, 2 and 3 Annex A of the manual) as a Self-Study Report (SSR) to be submitted to COREN.

Failure to meet any one of the qualifying requirements will mean that the programme shall not be assessed for accreditation, and the process shall stop here and no submission to COREN can be made by the institution. Institutions are advised to ensure all requirements are fulfilled by the programme before re-applying for accreditation.

For a programme going for Pre accreditation and Accreditation visitations, the SSR shall include:

- Self-Study of the concerns listed in the previous resource verification or accreditation, substantiated with evidence of actions taken to close these concerns, and results achieved from the actions. Give a summary of the concerns and action taken by closing these concerns in a tabular form.
- Updates on the fulfillment of the eight (8) Qualifying Requirements.
- Report on how the programme is addressing (closing the gap) newly introduced/revised accreditation requirements by COREN (if any).
- Updates on any changes in information, data, statistics, status, policies, etc., and report on Continuous Quality Improvement (CQI) activities related to the other nine (9) accreditation criteria. These may involve for example a change of programme name, PEO or PO statements, OBE model, academic curriculum (structure or content),

students' entry requirements, number of academic or support staff, number of academic staff with professional qualifications, staff student ratio, facilities.

- Any other related matters to be highlighted in any section/criteria.

ANNEX N: CHECKLIST OF DOCUMENTS FOR ACCREDITATIONS

RESOURCE VERIFICATION, PRE-ACCREDITATION AND ACCREDITATION VISITATION

INTRODUCTION

This Appendix contains checklist of Documents for Accreditation/Approval of New Programme and Relevant Information as follows:

1.Chapter 4: Self-Study Report (SSR) to be submitted in hard and soft copies.

Annex N-1: General Information

No.	RefertoSection4.2	To be filled out by the institution	Checked by Evaluator
1	Name of the institution.		
2	Address of institution.		
3	Name of Faculty/School/Department.		
4	Name and phone number of Staff to be contacted.		
5	Programme for Accreditation.		
6	EAC Reference Number.		
7	Degree to be Awarded and Abbreviation.		
8	Duration of Programme (in years).		

9	Institution Academic Session.		
10	URL Address; institution website.		

Annex N-2: History of Programme Accreditation

No.	Refer to Section 4.2	To be filled out by the institution	Checked by Evaluator
1	Introduction Year of Programme.		
2	Year of Last Accreditation for this Programme.		
3	Decision (if any) from Previous Accreditation.		
4	Action taken on the decision Above		
5	Major Changes (Self-Initiated) Reasons and Year of Changes.		

Annex N-3: Criterion1 - Programme Educational Objectives (PEOs)

No.	RefertoSections3.2.1 and4.3	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1	State the vision and mission of the institution and/or faculty/Programme.		
2	List the PEOs and state where they are published and publicized.		
3	Describe how the PEOs are consistent with the vision and mission of the institution and/or faculty and stakeholders' requirements.		
4	Describe the processes used to evaluate the level of achievement of the PEOs. This includes describing graduate's/alumni database, tools (survey, meetings, interviews, etc.) and frequency of activities and timelines.		
	Discuss the PEOs achievement results by the graduates/alumni.		

5			
6	Describe how the feedback and results obtained from the above processes are being used for the CQI of the programme.		
7	Describe the extent to which the programme's various stakeholders are involved in these processes.		
8	Describe CQI strategies to be implemented in relation to PEOs.		
9	Self-Study on programme performance related to PEOs based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-4: Criterion2 – Programme Outcomes (POs)

No.	RefertoSections3.2. 2and 4.4	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1	List the POs and state where they are published.		
2	Describe how the POs relate to the PEOs.		
3	Describe how the POs listed encompass and consistent with the 11 COREN POs.		
4	Describe the PO definition or elements/performance indicators.		
5	Describe the processes used to establish and review the POs, and the extent to which the program's various stakeholders are involved in these processes (where applicable). This includes describing the tools used in the processes (survey, meetings, interviews, etc.) and frequency of activities and timelines.		
6	Describe the mapping of courses with POs		

7	Explain how the assessment results are applied to further develop and improve the POs.		
8	Describe the materials, including student work and other evidence, that demonstrate achievement of the POs.		
9	Describe the extent to which the programme's various stakeholders are involved in the processes.		
10	Describe CQI strategies to be implemented in relation to POs		
11.	Self-Study on programme performance related to POs based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-5: Criterion3 - Course Learning Outcomes (CLOs)

No.	RefertoSections3.2.3 and 4.5	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1	List the CLOs and state where they are published.		
2	Mapping of CLOs to related POs (as per template given in **Annex B-2).**		
3	Describe the relationship between the CLOs and the POs		

4	Self-assess on programme performance related to CLOs based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-6: Criterion4 - Curriculum and Learning Process

No.	Refer to Sections 3.2.4and4.6	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1.	Discuss the programme structure and course contents to show how they are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the POs.		
2.	Discuss the programme delivery and assessment methods and how these are appropriate to, consistent with, and support the development of the range of intellectual and practical skills and attainment or achievement of the POs.		
3.	Provide evidence of the use of tutorials and non-conventional delivery methods such as Problem Based Learning (PBL) techniques alongside traditional lectures.		
4.	Provide evidence that students performed at least 10 laboratory practicals per semester (for at least 5 semesters from 300 level).		

5.	Provide evidence that students performed at least 10 engineering drawing assignments per semester in 200 level.		
6.	Describe how the requirements of Complex Problem Solving (CPS) and Complex Engineering Activities (CEA) have been addressed.		
7.	A matrix linking courses to POs to identify and track the contribution of each course to the POs (as per template given in **Annex-D**).		
8.	Distribution of the engineering courses according to areas specific to each programme (asper template given in **Annex-E**).		
9.	Distribution of the related non-engineering (general education) courses.		
10.	Distribution of the courses offered according to semester (as per template given in **Annex-F**).		
11.	Details of Laboratory equipment/workstations and experiments conducted (as per template given in **Annex-G**).		

12.	Self-assess on programme performance related to Curriculum Learning Process based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-7: Criterion5 - Students

No.	Refer to Sections 3.2.5and4.7	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1.	Discuss the requirement and process for admission of students to the program, response and annual intake (in addition to template given in **Annex-H**).		
2.	Discuss the policies and processes for students' transfer and credit transfer/exemption		
3.	Discuss mechanism for providing guidance to students on academic, career and aspects pertaining to wellness.		
4.			

	Discuss students' workload, class sizes for theory as well as laboratory sessions and completion of courses.		
5.	Describe formal or informal feedback platform/channel to obtain students feedback and suggestions for further programme improvement, and how have the feedback resulted in programme improvement.		
6.	Summarize the graduation requirements for the program, the process for ensuring and documenting that each graduate completes all graduation requirements for the programme (as per template given in Annex M).		
7.	Describe CQI strategies to be implemented in relation to Students		
8.	Self-assess on programme performance related to Students based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-8: Criterion6 - Continuous Quality Improvement (CQI)

No.	Refer to Sections 3.2.6and4.8	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1.	Discuss the mechanism for: programme planning; curriculum development; curriculum and content review; responding to feedback and inputs from stakeholders including industry advisors, students and alumni; tracking the contribution of individual courses to POs; tracking outcomes of performance through assessment, including rubrics; reviewing of PEOs and POs; and continuous quality improvement.		
2.	Discuss the implementation plan based on the observations of the last accreditation visit and the remedial actions taken		
3.	Evidence on the participation of faculty members and support staff as well as students in the continuous quality improvement process.		
4.	Evidence on the development of academic staff through opportunities in further education, industrial exposure, as well as research and development.		
5.	Policies, internal processes and practices that are in place at all levels within the institution relating to the accreditation criteria as stated in Chapter 3 of this Manual.		
6.	Summarize responses to the external examiner's report.		
7.	Discuss how the quality management system of the institution provides quality assurance and benchmarking with renowned national/international universities offering similar programme.		

8.	Evidence of the on-going participation of industry advisors in discussions and forums, professional practice exposure, and collaborative projects.		
9.	Provide at least ten (10) employers' feedback report on the performance of students who graduated within the last five (5) years.		
10.	Self-Study on programme performance related to CQI based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-9: Criterion 7 - Staffing

No.	Refer to Sections 3.2.7and4.9	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1.	Discuss the strength and competencies of the academic staff in covering all areas of the programme, and in implementing the outcome-based approach to education (as per template given in **Annexes-I-K**).		

2.	Discuss how the overall staff workload enables effective teaching (including student-teacher ratio), student-staff interaction, student advising and counselling, institutional service and research activities, professional development and interaction with industry.		
3.	Discuss processes for faculty development, training and retention. Produce retention index of staff of the programme.		
4.	Describe the role played by the faculty with respect to course creation, modification, and evaluation, their role in the definition and revision of Programme Educational Objectives and Programme Outcomes, and their role in the attainment of the Programme Outcomes. Describe the roles of others on campus, e.g., dean or provost, with respect to these areas.		
5.	Discuss the sufficiency and competency of technical and administrative staff in providing adequate support to the educational programme.		

6.	Produce evidence of how many staff has at least 3 publications in ISI-indexed journals in 5 years.		
7.	Self-assess on programme performance related to Staffing based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-10: Criterion 8 - Physical Facilities and Infrastructures

No.	Refer to Sections 3.2.8 and 4.10	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1.	Discuss the adequacy of teaching and learning facilities such as classrooms, learning-support facilities, study areas, information resources (library), computing and information-technology systems, laboratories and workshops, and associated equipment to cater for multi-delivery modes.		
2.	Describe the adequacy of support facilities such as hostels, sport and recreational centres, health centres, student centres, power and internet services, fire/security services, and transport in facilitating students' life on campus and enhancing character -building.		
3.	A summary, in tabulated form, of the lecture facilities (give number, capacity, and audio/video facilities available).		

4.	A summary, in tabulated form, of the laboratories (list down the details of workstation available in each laboratory).		
5.	A summary, in tabulated form, of the workshops/drawing studio (list the equipment/machinery available in each workshop/drawing studio).		
6.	A summary, in tabulated form, of the computer laboratories (list the hardware and software available).		
7.	A summary, in tabulated form, of recreational facilities.		
8.	A summary, in tabulated form, of information on recent improvements and planned improvements in facilities		
9.	Self-assess on programme performance related to Physical Facilities and Infrastructures based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-11: Criterion9 - Institutional Linkage and Community Services

No.	Refer to Sections 3.2.9and4.11	Indicate the location of these items in the submitted SSR	Checked by Evaluator

1	Discuss the involvement of industry in discussions and fora, professional practice exposure, and collaborative projects/research for the solutions to engineering problems.		
2	Discuss students' activities and involvement in student organizations that provide experience in management and governance, representation in education and related matters and social activities.		
3	Self-assess on programme performance related to Institutional Linkages and Community Services based on the following scale (with justifications): *Poor/Satisfactory/Good		

Annex N-12: Criterion 10 - Institutional Support and Funding

No.	Refer to Sections 3.2.10 and 4.12	Indicate the location of these items in the submitted SSR	Checked by Evaluator
1	Discuss institution's financial commitment and support to sustain and enhance the quality of programme. Also summarize the salient features in a tabular form (as per the template given in **Annex-L**)		
2	Self-assess on programme performance related to Institutional Support and Funding based on the following scale (with justifications): *Poor/Satisfactory/Good		

ANNEX O: EXTERNAL EXAMINER'S REPORT

The external examiner's report shall contain but is not limited to the following:

(i) Brief Assessment of programme curriculum.

(ii) Assessment of OBE implementation with respect to the achievement of CLOs and the relevant POs by the students in the courses given to the External Examiner.

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(iii) Assessment of examination papers and marking schemes set for the standard of questions, coverage of syllabus, adequate balance between theory and application, the category order (level) of Bloom's taxonomy covered by the questions, and appropriateness of marking scheme.

(iv) Assessment of the marked answer scripts based on a sample of good, average and weak candidates. Fairness/disparity of marking, follow-through method adopted if answer to one section is wrong, response of candidates to the question, and distribution of marks.

(v) Assessment of final year projects.

(vi) Assessment of the moderation process.