Bangladesh Accreditation Council

Discipline/Subject Specific Requirements for Accreditation of Academic Program

Discipline/Subject: Electrical & Electronics Engineering (EEE)

Standard 1: Governance

Governance system must work in a manner that ensures better management of the program towards the achievement of mission and objectives of the HEI/PoE in a way that effectively benefits the stakeholders.

Criterion 1-5: The HEI/PoE has a documented class size policy and maintains class size that is appropriate for effective management of the teaching-learning-assessment to ensure better attainment of learning outcomes.

Class size (number of students in both theory and practical class):

Bachelor: 30

Master: 30

Remarks:

1. The maximum class size is proposed considering that attaining learning outcomes requires teaching, learning and assessment of critical thinking skills, complex problem solving, creativity, etc. To assess such higher order skills, variety of assessment tools are to be used, going beyond the exam-centric assessment approach. Effective management of such classes in EEE and related programs cannot be done if class size is higher than 30.
2. Same maximum class size is proposed for both theory and practical classes because in many programs, lab and theory are integrated in the same course. The proposal should not exclude such possibility.

Standard 4: Curriculum

Curriculum must be outcome-based and consistent with the qualifications framework (QF) of Bangladesh for higher education. It should be comprehensive enough to guide the faculty and

students towards systematic attainment of learning outcomes and fulfilment of mission and objectives of the PoE.

Criterion 4-2: Curriculum aims at producing graduates focusing on graduate profile/attributes, that are defined following the identified needs of the stakeholders and learning domains in the QF of Bangladesh for higher education.

Graduate Attributes for Bachelor Degree Program:

1. Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization respectively to the solution of complex engineering problems.
2. Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. Design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.
5. Create, select and apply appropriate techniques, resources and modern engineering and IT tools, including prediction and modeling, to complex engineering activities with an understanding of their limitations.
6. Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.
7. Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.
8. Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
9. Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
10. Communicate effectively 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, and give and receive clear instructions.

11. Demonstrate 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, to manage projects and in multidisciplinary environments.

12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Graduate Attributes for Master's Degree Program by course:

1. Ability to apply deep subject related knowledge in multi-disciplinary setting
2. Ability to apply innovative and critical thinking to address discipline-specific challenges
3. Ability to assume leadership and entrepreneurial roles in professional behavior and activities
4. Ability to plan, organize and manage discipline specific projects and activities
5. Ability to acknowledge the requirements to perform effectively as a global citizen including acknowledgment and appreciation for ethics, integrity, diversity and multi-cultural settings
6. Ability to value sustainability and sustainable development goals and act accordingly in professional activities

Remarks:

1. Graduate attributes for Bachelor degree program are identical to the graduate attributes prescribed by the Washington Accord and BAETE
2. Graduate attributes for Master's degree program by course are proposed considering that the graduates should be globally employable with leadership, entrepreneurial and management skills who value sustainability

Criterion 4-7: In case of Bachelor degree program curriculum of the program includes minimum 25% of total credits for general education courses with clearly defined course learning outcomes and mapped with PLOs and learning domains of QF. In case of Master's degree program curriculum of the program includes minimum 10% of total credits for general education courses with clearly defined course learning outcomes and mapped with PLOs and learning domains of QF.

List of general education courses include but are not limited to:

1) Bangladesh studies	14) Human resource development
2) Emergence of Bangladesh	15) Business communications
3) History	16) Entrepreneurship and career development
4) Literature and culture	17) Psychology
5) Languages	18) Sustainable development
6) Philosophy	19) Human rights and law
7) Sociology	20) Environment and disaster management
8) Government and politics	21) Physical and mental wellbeing
9) Economics	22) Ethics and professional responsibilities
10) Management	23) Biology
11) Accounting	24) Health and nutrition
12) Marketing	25) Data science
13) Finance	

The program offering entity (POE) may select appropriate courses considering program learning outcomes (PLO)/ Course learning outcomes (CLO).

Criterion 4-9: Provisions of internship/project/dissertation/field work/work integrated learning opportunities are included in the curriculum.

Project: Capstone project is mandatory (1 year long, may be started in the 3rd year)

Internship/dissertation: Optional

Remark:

Capstone project is an internationally accepted academic activity to apply prior learning in an integrated manner and to demonstrate the culmination of the learning outcomes.

Standard 6: Student Admission & Support Services

The HEI/PoE must set appropriate entry requirements and select the right candidates for a particular program under a fair and transparent admission policy. Students must have adequate and appropriate supports for better attainment of learning outcomes, exploring potentials,

molding personality and preparing them for the real-life situation with sense of responsibility and integrity.

Criterion 6-1: The HEI/PoE maintains a clearly defined and well-communicated admission policy with transfer and withdrawal provisions, entry requirements that reflect the level of qualifications required to match with the nature of the discipline and mission of the PoE. Admission policy is effective to select students who have potentials and are able to afford the academic load to complete the program successfully.

Requisite qualifications for admission in the Bachelor Degree (Undergraduate) program:

a) Completion of HSC or an equivalent program (level 5 of BNQF) or Diploma in Engineering program (level 6 of BNQF).
b) Proficiency in HSC level Math, Physics and English

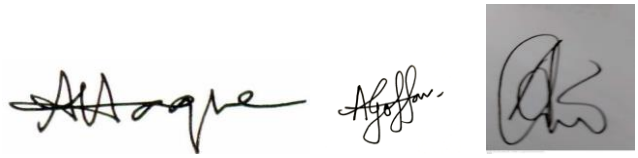
Requisite qualifications for admission in the Master's Degree Program by course:

Completion of a bachelor program in EEE or a related discipline. Competence in relevant undergraduate level courses of the discipline.

Criterion 6-7: PoE ensures and facilitates the participation of students in co-curricular activities and community services under the management of the HEI on a regular basis to promote creativity, social responsiveness, leadership qualities, values, molding personality towards holistic development.

List of co-curricular activities (not limited to) to support the defined Graduate Attributes and CLO/PLO. PoE will select the appropriate co-curricular activities. PoE will encourage and confirm the participation of the program students:

1. Programming
2. Project competitions
3. Interactions with the industry through internships, visits, etc
4. Job fair and career counseling activities
5. Technical seminars, workshops and conferences
6. Outreach activities to address societal needs
7. Activities towards achieving UN SDGs
8. Activities towards entrepreneurship and leadership development
9. Debating
10. Activities towards developing awareness on contemporary local and global issues



Standard 7: Faculty and Professional Staff

The HEI/PoE must have a policy to ensure the availability of adequate qualified faculty and professional staff with reasonable teacher student ratio.

Criterion 7-8: The PoE maintains ideal combination of faculty with 10% Professor, 20% Associate Professor, 40% Assistant Professor and 30% Lecturer with reasonable teacher student's ratio, depending on the nature of discipline, as necessary for effective teaching learning in the academic program/discipline.

Teacher-Student ratio: 1:20

Class Load of Faculty in a Semester/Year (No. of credit/Course): 12 credits (6 three-credit theory courses) or equivalent per year

Standard 8: Facilities & Resources

The HEI/PoE must ensure availability and access to the appropriate and adequate facilities & resources necessary for effective teaching learning and research depending on the nature of discipline and program.

Criterion 8-4: Laboratory facilities, instructional technology & software, IT learning facilities that are identified through curriculum mapping as necessary to attain the defined learning outcomes of program and course(s) and to conduct research are in good condition with appropriate safety measures, appropriate, adequate and accessible when needed by the students and faculty members under a policy that ensures timely repair/replacement, supply and continuous improvement.

List of Required Laboratories for EEE:

1. Circuits lab,
2. Electronics lab,
3. Communication lab,
4. Programming and simulation lab,
5. Electrical machines lab,
6. Power systems lab.

List of Optional Laboratories for EEE (not limited to):

1. VLSI lab,
2. Control system lab,
3. Microwave and RF lab,
4. Switchgear lab,
5. High voltage lab,
6. Power electronics lab,
7. Microprocessor/embedded system lab,
8. Digital signal processing lab.

List of Required Laboratories for ETE/ECE or similar programs:

1. Circuits lab,
2. Electronics lab,
3. Communication lab,
4. Programming and simulation lab.

List of Optional Laboratories for ETE/ECE or similar programs (not limited to):

1. VLSI lab,
2. Control system lab,
3. Microwave and RF lab,
4. Microprocessor/embedded system lab,
5. Digital signal processing lab.

Remark:

This list of labs is not a sufficient list, rather only the necessary list. A EEE or a similar program is expected to have additional labs as well, such as, Controls lab, VLSI lab, Switchgear lab (for EEE), etc.

List of instructional technology and software (IT facilities): Modern engineering software related to the various courses offered

Remark:

Many EEE courses, particularly advanced courses, require extensive use of software. Examples of such courses include VLSI, Digital Signal Processing, Microprocessors, Embedded systems, etc. When such courses are taught, students should learn the use of subject related software tools too.