Name of the Degree

Bachelor of Science in Electrical & Electronic Engineering, abbreviated as B. Sc. Engineering (Electrical & Electronic Engineering)

About the Program:

Electronics & Electronic Engineering (EEE) plays decisive role in all fields of modern human deeds. Accordingly, EEE has recognized itself as one of the most important branches of engineering. The Bachelor of Science in EEE curriculum covers the fundamental aspects of Electrical and Electronic Technology, highlights basic principles and teaches the students in the use of these principles to reach optimal design solution for engineering problems. The technical aspects of this branch of engineering are often categorized by terms such as Mathematics, Physics, Chemistry, Economics, Social science, Arts and Humanities, Business, Basic Mechanical, Civil and Computer Science & Engineering and Basic Electrical Engineering in the first year. The other three years are devoted to the Engineering Mathematics, Electrical circuits, Electrical machines and drives, Analog electronics, Digital electronics, Power electronics, Electromagnetic fields, Special programming techniques, Power transmission and distribution, Electrical measurement and instrumentation, Control system engineering, Communication engineering, Switchgear and protection, Power station and economy, Microwave engineering and Antenna design, Microprocessors and Microcomputers, VLSI, Signal processing and other recent topics of Electrical and Electronic engineering. The curriculum includes theoretical courses, laboratory works, industrial training and different field trips. Indeed, the new generation of electrical engineers is stimulated to commence high-quality education along with research and development activities in the above areas and this department is devoted to the study and analysis of fundamental as well as applied problems.

Graduate Attributes (based on need assessment)

An engineering program that aims to attain PLOs should ensure that its curriculum encompasses all the attributes of the Knowledge Profile (K1 – K8) as presented in Table 3.1 and as included in the PLO statements. The ranges of Complex Problem Solving (P1 – P7) and Complex Engineering Activities (A1 – A5) that should be addressed in the program are given in Tables 3.2 and 3.3, respectively.

Table 3.1: Knowledge Profile

K1	A systematic, theory-based understanding of the natural sciences applicable to the discipline
K2	Conceptually based mathematics, numerical analysis, statistics and the formal aspects of computer and information science to support 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 that supports engineering design in a practice area
K6	Knowledge of engineering practice (technology) in the practice areas in the engineering discipline
K7	Comprehension of the role of engineering in society and identified issues in engineering practice in the discipline: ethics and the engineer's professional responsibility to public safety; the impacts of engineering activity; economic, social, cultural, environmental and sustainability
K8	Engagement with selected knowledge in the research literature of the discipline or sub-problems

Table 3.2: Range of Complex Engineering 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	P2: Involve wide-ranging or conflicting technical, engineering
Depth of analysis required formulate suitable models	P3: Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models
Familiarity of issues	P4: Involve infrequently encountered issues
Extent of applicable codes	P5: Are outside problems encompassed by standards and codes of practice for professional engineering
Extent of stakeholder involvement and conflicting requirements	P6: Involve diverse groups of stakeholders with widely varying needs
Interdependence	P7: Are high level problems including many component parts or sub-problems

Table 3.3: Range of Complex Engineering Activities

Attribute	**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 (and for this purpose resources include people, money, equipment, materials, information and technologies)
Level of interaction	A2: Require resolution of significant problems arising from interactions between wide-ranging or conflicting technical, engineering or other issues
Innovation	A3: Involve creative use of engineering principles and research-based knowledge in novel ways
Consequences for society	A4: Have significant consequences in a range of contexts, and the environment characterized by difficulty of
Familiarity	A5: Can extend beyond previous experiences by applying Principles-based approaches

Program Educational Objectives (PEOs)

The following "Program Educational Objectives" are reflected our graduate's achievements in the initial part of their careers. Few years after graduation (3-5), graduates of the Electrical and Electronic Engineering program will:

PEO 1	Make the graduates as enthusiastic professionals to meet the anticipations of their employers and continue their professional progress or pursue formal education to earn advanced degrees and/or certifications.
PEO 2	Dynamically involve the graduates to solve the problems with independent thinking and skills with a drive towards excellence in their job/study performance
PEO 3	Involve the graduates in life-long learning and research-based education demonstrated by advanced erudition/degrees, professional development activities, and/or other career-enhancing activities
PEO 4	Exposes leadership in their professional accomplishments and/or in their communities.

Program Learning Outcomes (PLOs)

PLO 1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization, respectively to the solution of complex engineering problems
PLO 2	**Problem Analysis:** Identify, formulate, research literature and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
PLO 3	**Design/ development of solutions:** 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.
PLO 4	**Investigation:** 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.
PLO 5	**Modern Tool Usage:** Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitations
PLO 6	**The Engineer and Society:** 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.
PLO 7	**Environment and Sustainability:** Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.
PLO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
PLO 9	**Individual and Team work:** Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
PLO 10	**Communication:** 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
PLO 11	**Project Management and Finance:** 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

PLO 12	**Life-long learning:** 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.

Structure of the Curriculum

● Duration of the program

Years/Levels: 4

Semesters/Terms: 8

● Duration of Terms and Rules for Conducting Course(s)

The duration of each of the Term-I and Term-II will be as follows:

Term- I

Classes	15 Weeks
Review Classes/Preparatory Leave for Mid-term Exam	1 Week
Mid-term Examination	2 Weeks
Review Classes/Preparatory Leave for Semester Final Examination	1 Week
Semester Final Examination	2 Weeks
Semester Break	2 Weeks
Preparation for Supplementary/Retake Exam	1 Week
Retake/ Supplementary Exam	1 Week
Total	**25 Weeks**

Term- II

Classes	15 Weeks
Review Classes/Preparatory Leave for Mid-term Exam	1 Week
Mid-term Examination	2 Weeks
Review Classes/Preparatory Leave for Semester Final Examination	1 Week
Semester Final Examination	2 Weeks
Semester Break	2 Weeks
Preparation for Supplementary/Retake Exam	1 Week
Retake/ Supplementary Exam	1 Week
Total	**25 Weeks**

**National holidays and other Vacations throughout the Levels-2 weeks

● Supplementary Exam

If a student fails to appear in either midterm or final exam in running semester or both for a valid reason able to opt for attend those exams (at best two courses) with a fee set by the authority. In this case, student must appeal addressing to the Registrar through Chairman of the department before ending of the final examination. This option is also valid for the failed courses (at best two courses) of the running semester and retaking/re-retaking the courses for immediate lower grade student obtains.

● Course Code Designation and Numbering System:

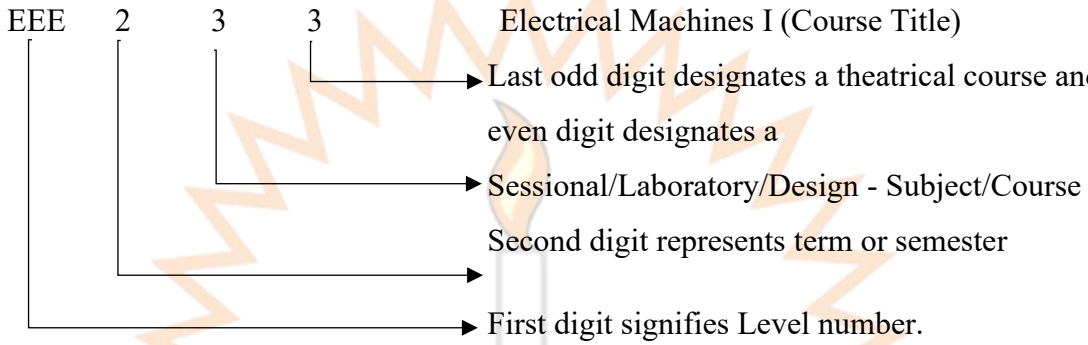
Each course has been designed by a two to four letter word identifying the Department that offers it followed by a three-digit number with the following criteria.

a. The first digit will represent the Level in which the course is taken by the students.

b. The second digit will be identified the term or semester. It can be used also for different major areas of the department, if the department has completely various major areas such as electronic, communication, power etc. and students are divided into different major areas in particular level usually in fourth year.

c. The last digit will represent a theatrical course when it is an odd digit and a Sessional/Laboratory/Design – Subject/course when it is even.

The course designation system is illustrated by one example as shown below:



Ex. EEE 361 means EEE for Electrical and Electronic Engineering
3 for 3rd Level
6 for Six Semester
1 for Theory courses

● Admission Requirements

All applicants must meet one of the following requirements to apply for admission in B.Sc. in Electrical and Electronics Engineering program:

a. Minimum GPA 2.5 both in S.S.C/equivalent and H.S.C/equivalent from science background with mathematics & physics or other fields of study.

b. Minimum 5 subjects in O-Level and 2 subjects in A-Level with minimum grade of B in 4 (Four) subjects and minimum grade of C in 3 (Three) subjects from science background with mathematics and physics or other fields of study.

c. Applicants will be selected for admission through admission test which includes written exam as well as viva voce. Applicants who will score satisfactory marks in written test will be qualified for viva voce.

● Credit Transfer Policies:

The Department of EEE developed its credit transfer policies that incorporate the general principles and guidelines of Feni University (FU) credit transfer policies.

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The following policies apply to all transfer students to the Department of EEE at FU who wish to transfer credits from other institutions:

a. Applicants must submit following documents to apply for the credit transfer.

b. Completed Application for Credit Transfer form.

c. Official Transcript of the previously attended colleges and universities.

d. Complete syllabus of the course(s) that are applied for credit transfer

e. The credit transfer from other universities will not exceed 50% of the credits required for degree completion of FU.

f. The results of courses transferred from other universities will not be mentioned in the Transcript of Feni University, but title and number of credits will be remained.

g. Course credits with a grade of 'C+' [GPA 2.50] or better earned at other recognized universities may be allowed as transferable credits to FU.

● **Summary of the category of courses**

SL	Group	Theory	Lab	Total
1	General Education Courses	18.00	1.00	19.00
2	Basic Science	24.00	2.25	26.25
3	Other Engineering	06.00	04.50	10.50
4	Core Courses	54.00	28.50	82.50
5	Elective Courses	15.00	3.00	18.00
	Total	**117.00**	**39.25**	**156.25**

● **Maximum academic years of completion:** 6 academic years

● **Total class weeks in a Year/semester:** 15 weeks/Term

● **Total minimum credit requirement to complete the program:** 156.25

● **Minimum CGPA requirements for graduation:** 2.50

● **Category of Courses**

1. General Education

Course No.	Course Title	Credit	BUET-equivalence Course†
ENG 101	English	3.00	HUM 135
ENG 102	Developing English Skills Laboratory	1.00	HUM 272
BNG 101	Bengali Language and Literature	3.00	FU Unique
HUM 301	Engineering Ethics and Entrepreneurship	3.00	FU Unique
HUM 201	Financial and Managerial Accounting	3.00	HUM 279
HUM 203	Fundamentals of Economics	3.00	HUM 277
BNG 103	Bangladesh Studies (History of Independence)	3.00	FU Unique

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2. Basic Science

Course No.	Course Title	Credit	BUET equivalence Course†
PHY 101	Physics I	3.00	PHY 121
PHY 102	Physics I Sessional	0.75	FU Unique
PHY 103	Physics II	3.00	PHY 165
PHY 104	Physics II Sessional	0.75	PHY 102
CHEM 201	Chemistry	3.00	CHEM 101
CHEM 202	Chemistry Sessional	0.75	CHEM 114
MATH 101	Engineering Mathematics-I (Differential and Integral Calculus)	3.00	MATH 157
MATH 103	Engineering Mathematics-II (Complex number and Vector Analysis)	3.00	MATH 159
MATH 201	Engineering Mathematics-III (Ordinary and Partial Differential Equation)	3.00	MATH 257
MATH 203	Engineering Mathematics-IV (Linear Algebra)	3.00	MATH 259
MATH 301	Engineering Mathematics-V (Probability and Statistics)	3.00	MATH 357

3. Other Engineering

Course No.	Course Title	Credit	BUET equivalence Course†
CSE 101	Computer Programming	3.00	CSE 109
CSE 102	Computer Programming Sessional	1.50	CSE 110
ME 201	Fundamentals of Mechanical Engineering	3.00	ME 267
ME 202	Fundamentals of Mechanical Engineering Sessional	1.50	ME 268
CE 202	Engineering Drawing	1.50	CE 106

4. Core courses

Course No.	Course Title	Credit	BUET equivalence Course†
EEE 111	Electrical Circuits I	3.00	EEE 101
EEE 112	Electrical Circuits I Sessional	1.50	EEE 102
EEE 121	Electrical Circuits II	3.00	EEE 105
EEE 122	Electrical Circuits II Sessional	1.50	EEE 106
EEE 233	Electrical Machines I	3.00	EEE 203
EEE 243	Electrical Machines II	3.00	EEE 205
EEE 244	Electrical Machines Sessional	1.50	EEE 206
EEE 353	Power System Analysis	3.00	EEE 305
EEE 354	Power System Analysis Sessional	1.50	EEE 306
EEE 367	Electrical Properties of Materials	3.00	EEE 307
EEE 124	Circuit Simulation Lab	1.50	FU Unique

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EEE 231	Electronics I	3.00	EEE 201
EEE 232	Electronics I Sessional	1.50	EEE 202
EEE 245	Electronics II	3.00	EEE 207
EEE 246	Electronics II Sessional	1.50	EEE 208
EEE 351	Digital Electronics	3.00	EEE 303
EEE 352	Digital Electronics Sessional	1.50	EEE 304
EEE 481	Solid State Devices	3.00	EEE 313
EEE 471	Biomedical signals, instrumentation and measurements	3.00	EEE 425
EEE 472	Biomedical signals, instrumentation and measurements Sessional	1.50	EEE 426
EEE 357	Engineering Electromagnetics	3.00	EEE 209
EEE 241	Continuous Signals and Linear Systems	3.00	EEE 211
EEE 355	Communication System I	3.00	EEE 309
EEE 356	Communication System I Sessional	1.50	EEE 310
EEE 363	Communication System II	3.00	EEE 439
EEE 364	Communication System II Sessional	1.50	FU Unique
EEE 365	Digital Signal Processing	3.00	EEE 311
EEE 366	Digital Signal Processing Sessional	1.50	EEE 312
EEE 361	Control Systems	3.00	EEE 317
EEE 362	Control Systems sessional	1.50	EEE 318
EEE 473	Microprocessors and Computer Interfacing	3.00	EEE 415
EEE 474	Microprocessors and Computer Interfacing Sessional	1.50	EEE 416
EEE 476	Numerical Technique Lab (MATLAB)	1.50	EEE 212
EEE 350	Integrated Design Project	1.50	FU Unique
EEE 470	Industrial Training	1.50	FU Unique
EEE 480	Project/Thesis	3.00	EEE 400

5. Elective Courses

Students will take at least two theories and one laboratory courses from her/his major area and three theories and one laboratory courses from other areas.

Course No.	Course Title	Credit
EEE*	Elective (Major I)	3.00
EEE*	Elective (Major II)	3.00
EEE*	Elective Sessional (Major I)	1.50
EEE*	Elective (Minor I)	3.00
EEE*	Elective (Minor II)	3.00
EEE*	Elective Sessional (Minor I)	1.50
EEE*	Elective (Minor III)	3.00

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Elective I (Power)

Course No.	Course Title	Credit	BUET equivalence Course†
EEE 431	Power Electronics	3.00	EEE 315
EEE 432	Power Electronics Lab	1.50	EEE 316
EEE 433	Power System Protection	3.00	EEE 477
EEE 434	Power System Protection Lab	1.50	EEE 478
EEE 435	Transmission & Distribution of Electrical Power	3.00	EEE 485
EEE 421	Electrical Machines III	3.00	EEE 471
EEE 437	Power System Reliability	3.00	EEE 479
EEE 439	Power Plant Engineering	3.00	EEE 475

Elective II (Communication & Signal Processing)

Course No.	Course Title	Credit	BUET equivalence Course†
EEE 441	Microwave Engineering	3.00	EEE 433
EEE 442	Microwave Engineering Lab	1.50	EEE 434
EEE 443	Random Signal and Processes	3.00	EEE 417
EEE 445	Optical Fiber Communication	3.00	EEE 435
EEE 447	Cellular Mobile Communication	3.00	FU Unique
EEE 449	Telecommunication Engineering	3.00	EEE 441

Elective III (Electronics)

Course No.	Course Title	Credit	BUET equivalence Course†
EEE 451	VLSI Design I	3.00	EEE 467
EEE 452	VLSI Design I Lab	1.50	EEE 468
EEE 453	VLSI Design II	3.00	FU Unique
EEE 454	VLSI Design II Lab	1.50	FU Unique
EEE 455	Analog Integrated Circuits	3.00	EEE 465
EEE 457	Processing & Fabrication Technology	3.00	EEE 451
EEE 459	Optoelectronics	3.00	EEE 459

† - OBE Curriculum for the Undergraduate Program of the Department of Electrical and Electronic Engineering, BUET, Prepared by Department of EEE, BUET, February 2023.

Grading/Evaluation

● Grading Scale

Each course has a certain number of credits, which describes its corresponding weightage. A student's performance is measured by the number of credits completed satisfactorily and by the weighted average of the grade points earned. A minimum grade point average (GPA) is essential for satisfactory progress. A minimum number of earned credits also have to be

acquired in order to qualify for the degree. Letter grades and corresponding grade points are given in grading scale/grades.

The performance of the students in the course work is evaluated by letter grading systems as described below:

Marks Range	Grade	Grade Point	Interpretation
80% and above	A+	4.00	Outstanding
75% to below 80%	A	3.75	Excellent
70% to below 75%	A-	3.50	Very Good
65% to below 70%	B+	3.25	Good
60% to below 65%	B	3.00	Satisfactory
55% to below 60%	B-	2.75	Above Average
50% to below 55%	C+	2.50	Average
45% to below 50%	C	2.25	Below Average
40% to below 45%	D	2.00	Pass
Less than 40%	F	0.00	Fail
	I	0.00	Incomplete

● **Grade**

The minimum passing grade in a theory course shall be 'D' and the minimum passing grade in a Laboratory / Sessional / Project / Thesis, field work course/Industrial Training (henceforth referred to as sessional course) will be 'D'.

● **Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA)**

Grade Point Average (GPA) is the weighted average of the grade points obtained in all the courses passed/completed by a student in a Term. 'F' grades will not be counted for GPA calculation. GPA of a Term will be calculated as follows:

$$\text{GPA}=\frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$$

Where,

n is the number of courses passed by the student;

C_i is the number of credits assigned to a particular course i;

And **G_i** is the grade point corresponding to the grade awarded for i-th course.

The **Cumulative Grade Point Average (CGPA)** gives the cumulative performance of the student from first Term up to any other Term to which it refers and is computed by dividing the total grade points ($\sum C_i G_i$) accumulated up to the date by the total credit hours ($\sum C_i$).

$$\text{CGPA}=\frac{\sum_{i=1}^{n} C_i G_i}{\sum_{i=1}^{n} C_i}$$

Both GPA and CGPA will be rounded off to the second place of decimal for reporting.

● **Assessment Strategy**

The total performance of a student in a given course is based on the following marks distribution.

Marks Distribution (Theoretical Courses)

Assessment Type	Particulars	Marks (%)
Continuous Assessment	Class Attendance and Participation	10
	Class Test/Quiz test	10
	Assignment/Case study	10
	Presentation/Field work/Mini Project	10
Summative Assessment	Mid Term Exam (Written)	20
	Final Term Exam (Written)	40
	Total	**100**

Marks Distribution (Lab Courses)

Assessment Type	Particulars	Marks (%)
Continuous Assessment	Attendance	10
	Lab Performance	10
	Lab Report	20
Summative Assessment	Final Lab Assessment/Quiz	40
	Viva-Voce	20
	Total	**100**

Marks Distribution (Project/ Thesis/ Industrial Training)

Assessment Type	Particulars	Marks (%)
Supervisor (40%)	Literature Survey (LS)	10
	Experimental Observation (EO)	20
	Presentation and Report Writing (PR)	10
External Member (30%)	Experimental Observation (EO)	10
	Results & Discussion (RD)	10
	Presentation and Report Writing (PR)	10
Internal Members (30%)	Experimental Observation (EO)	10
	Results & Discussion (RD)	10
	Presentation and Report Writing (PR)	10
	Total	**100**

● **Course Withdrawal**

If any student is intended to withdraw a course after registration, s/he must apply to the Registrar through the Head of the concerned Discipline for total withdrawal of that course within maximum four (4) weeks of the beginning of the semester. However, if s/he attends the mid-term examination, the student is not allowed to withdraw from any registered course

● **Incomplete (I) courses**

If a student misses final examination of a course then the course will be shown as incomplete course.

● **Retake**

A student who obtains an **F grade** in a course will be required to retake the course by paying full tuition fee and examinations fee as determined by FU authority. The grade obtained on repeating the course will replace his original grade (F). The passed/higher grade will be taken into account toward calculating the final CGPA and the failed grade (F) will not be shown in the transcript. There will be no limit on the number of times a course can be retaken. Students getting special waiver will not be eligible to get the benefit of tuition fee waiver for the courses s/he retakes. However, in case of credit limit per semester, a student may be allowed to register for up to a maximum of 30 credits if recommended by Chairman of the concerned department.

● **Grade Improvement**

If a student gets **less than B** grade in any course, s/he may repeat the course maximum twice to improve the relevant grade. The higher grade will be taken into account toward calculating the final CGPA and the lower grade will not be shown in the transcript. The student will have to pay 40% of course fee along with full examination fee per course. Students enjoying special waiver will not be eligible to get the benefit of tuition fee waiver for the courses for which s/he wants to improve grade.

● **Dropout**

If any student misses all the mid-term and final examinations of a semester, the student will be considered as drop-out for that semester. However, if s/he attends any examination such as mid-term or final of any course, the student will not be considered as a drop-out student.

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