



North Bengal International University

Faculty of Science and Engineering
Department of Electrical and Electronic Engineering
Syllabus for 4 Year B.Sc. in Electrical and Electronic Engineering
Semester: 12

Department of Electrical and Electronic Engineering

1. Mission and Vision:

The objective of the B.Sc. (Engg.) in Electrical and Electronic Engineering program is to provide a unique opportunity for students to get quality education in the field of Electrical and Electronic Engineering. The program covers a comprehensive curriculum following standard international guidelines. The program has been designed so as to achieve the perfect blend of theory and practice in order to provide a path for students to steadily increase their engineering skills. It is expected that with this program the student will gain knowledge in Power Electronics and Machine Drives, Power System Protection and Reliability, Semiconductor Material, Antenna Design, Signal Processing, VLSI, Optical Communication, and so on. The graduates from this department are recruited by both academia and industry of home and abroad and they are performing well.

2. Admission requirements:

The minimum qualifications for admission into the undergraduate program are:

- A. Higher Secondary Certificate (H.S.C) for its equivalent in Science with Mathematics, Physics, and Chemistry.
- B. The O-A Level students must have an average grade of B, and also
- C. Fulfilling any other conditions fixed by the authority.

3. Credit Hours:

Teaching for the courses is reckoned in credits and the credits allotted to various courses are on the following guidelines:

Nature of Course	Contact hour	No. of Credit
i) Theory Lecture	1 hour/week	1
ii) Tutorial	1 hour/week	1
iii) Independent Lab/ Sessional/ Design	2 hour/week 3 hour/week	1 1.5
iv) Project/ Thesis	2 hour/ week	1

4. Grading and Point System:

4.1 Grading System:

The letter grade system shall be used to assess the performance of the student and shall be as follows:

Numerical Grade	Letter Grade	Grade Point
80% or above	A+	4.0
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.5
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.0
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.5
45% to less than 50%	C	2.25
40% to less than 45%	D	2.0
Less than 40%	F	0
Incomplete	I	-

A grade 'I' shall be awarded for courses (like project & thesis, design, etc.) in the 4th year 1st semester which continue through to the 4th year 3rd semester.

4.2. Point System:

Grade Point Average (GPA) is the weighted average in a semester. 'F' grades do not count for GPA calculation. GPA of a semester will be calculated as follows:

$$\text{Grade Point Average} = \frac{\sum_{i=1}^n C_i G_i}{\sum_{i=1}^n C_i}$$

Where n is the total number of courses passed by the student in the semester, C_i is the number of credits allotted to a particular course i and G_i is the grade point corresponding to the grade awarded for i- th course.

The overall or Cumulative Grade Point Average (CGPA) gives the cumulative performance of the student from first semester up to any other semester 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 ($\sum C_i$). Both GPA and CGPA will be rounded off to the second place of decimal for reporting.

5. Distribution of Marks:

The distribution of marks for a given course is as follows:

Theory Courses:	
Class Attendance	: 5%
Class Performance	: 5%
Quizzes/Class tests	: 10%
Assignment	: 10%
Mid Term	: 20%
Term Final	: 50%
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Total	: 100%

Sessional Courses:	
Class Attendance	: 5%
Class Performance	: 5%
Quiz/Lab test	: 15%
Report Submission	: 50%
Viva voce (conducted by course teacher)	: 25%
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Total	: 100%

Project and Thesis:	
Viva voce (conducted by a viva voce committee)	: 20%
Supervisor (internal examiner)	: 50%
External examiner	: 30%
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Total	: 100%

5.1 Basis for awarding marks for class participation and attendance will be as follows:

<u>Attendance</u>	<u>Marks</u>
90% and above	5%
85% to less than 90%	4.5%
80% to less than 85%	4%
75% to less than 80%	3.5%
70% to less than 75%	3%
65% to less than 70%	2.5%
60% to less than 65%	2%
Less than 60%	0%

6. Credit Transfer:

There shall be no admission on transfer in the 1st year 1st semester program. In special cases, students may be admitted into a higher class.

A student may be allowed to transfer all courses of this University completed by the student at other universities/institutions.

7. Course Designation and Numbering System:

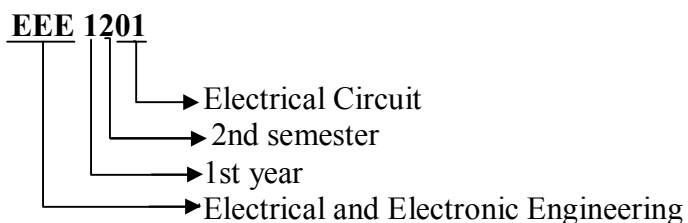
Each course is designated by a three to four letter word identifying the department, which offers it following, by a four-digit number with the following criteria:

- The 1st digit corresponds to the year in which the course is normally taken by the students.
- The 2nd digit corresponds to the semester in which the course is normally taken by the students.
- The 3rd and 4th digits are reserved for departmental use indicating major area.

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

Course No. EEE 1201

Course Title: Electrical Circuit-II



8. Course Load:

Students, serving in different organizations may be admitted as part-time students with a written consent from the employer.

A part-time student may be assigned a maximum of 9 credit hours of course work in a semester. A full-time student may be assigned a maximum of 17 credit hours per semester.

9. Graduation Requirements:

- a. The total number of credits that a student has to complete successfully for the award of B.Sc. Engineering Degree is 146.
- b. The minimum CGPA requirements for obtaining a Bachelor of Engineering Degree are 2.20.
- c. A student may take additional courses with the consent of his/her head of the department in order to raise CGPA, but he/she may take a maximum of 15 such additional credits beyond respective credit requirements for bachelor's degree during his/her entire period of studentship.

10. Time Limits of Completion of Bachelor's Degree:

A student must complete his/her Bachelor's Degree within a maximum period of six years for engineering.

Chapter 1 Courses for B.Sc. in Electrical and Electronic Engineering

1.1 Semester-wise Distribution of Credits

Sl. No	Year/ Semester	Theory		Sessional		Total Credits
		No of Course	Credits	No of Course	Credits	
1	1st/1 st	3	9	2	3	12
2	1st/2 nd	3	9	2	3	12
3	1st/3 rd	3	9	2	3	12
4	2nd/1 st	3	9	2	3	12
5	2nd /2 nd	3	9	2	3	12
6	2nd/3 rd	3	9	2	3	12
7	3rd/1 st	4	12	1	1	13
8	3rd/2 nd	4	12	2	2	14
9	3rd/3 rd	3	9	2	3	12
10	4th/1 st	3	9	2	3	12
11	4th/2 nd	3	9	2	3	12
12	4th/3 rd	2	6	3	5	11
Total		36	108	24	36	146

1.2 Summary of Undergraduate Course Plan

Sl. No.	Course Type		Credit	%	
1	Departmental Courses				
	Core Courses	Theory	51.0		
		Lab	27.0		
	Elective Courses	Theory	12.0		
		Lab	2.0		
Sub-Total			92.0	63.02%	
2	Related Courses				
	General Education	Theory	15.0		
		Sub-Total			15.0
	English	Theory	3.0		
		Lab	1.5		
	Sub-Total			4.5	3.08%
	Mathematics	Theory	15		
		Sub-Total			15.0
	Basic Sciences	Theory	9.0		
		Lab	3.0		
	Sub-Total			12.0	8.22%
Related Engineering	Theory	6.0			
	Lab	1.5			
Sub-Total			7.50	5.14%	
Total			144	100%	

1.3 List of Undergraduate Courses

1.3.2 General Education

** = For 3rd year 1st semester 31, 3rd year 2nd semester 32, 3rd year 3rd semester 33, 4th year 1st semester 41 & 4th year 2nd semester 42. (Taking any Five from the Seven)

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	Hum **11	Government and sociology	3	3.0
2	Hum **11	Economics	3	3.0
3	Hum **11	Financial Accounting	3	3.0
4	Hum **11	Legal Issues for Engineers & Introduction to Management	3	3.0
5	Hum **11	Project Planning, Management & Engineering	3	3.0
6	Hum **11	Introduction to Psychology	3	3.0
7	Hum **11	Bangladesh Studies	3	3.0
Total			15	15.0

1.3.2 English

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	Eng 1311	Technical English	3	3.0
2	Eng 1312	Technical English Sessional	2	1.5
Total			5	4.5

1.3.3 Mathematics

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	Math 1101	Engg. Mathematics I	3	3.0
2	Math 1201	Engg. Mathematics II	3	3.0
3	Math 2101	Engg. Mathematics III	3	3.0
4	Math 2201	Engg. Mathematics IV	3	3.0
5	Math 3101	Engg. Mathematics V	3	3.0
Total			15	15.0

1.3.4 Basic Science (Physics)

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	Phy 1111	Physics I	3	3.0
2	Phy 1112	Physics I Sessional	2	1.5
3	Phy 1211	Physics II	3	3.0
Total			8	7.5

1.3.5 Basic Science (Chemistry)

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	Chem 1311	Chemistry	3	3.0
2	Chem 1312	Chemistry Sessional	2	1.5
Total			5.0	4.5

1.3.1 Core Courses (EEE)

Sl. No.	Course Number	Course Title	Credit
1	EEE 1101	Electrical Circuits I	3.0
2	EEE 1102	Electrical Circuits I Sessional	1.5
3	EEE 1201	Electrical Circuits II	3.0
4	EEE 1202	Electrical Circuits II Sessional	1.5
5	EEE 1303	Semiconductor Devices	3.0
6	EEE 1304	Semiconductor Devices Sessional	1.5
7	EEE 2103	Electronics I	3.0
8	EEE 2104	Electronics I Sessional	1.5
9	EEE 2203	Electronics II	3.0
10	EEE 2204	Electronics II Sessional	1.5
11	EEE 2105	Electrical Machine I	3.0
12	EEE 2106	Electrical Machine I Sessional	1.5
13	EEE 2205	Electrical Machine II	3.0
14	EEE 2206	Electrical Machine II Sessional	1.5
15	EEE 2301	Signals and Linear Systems	3.0
16	EEE 2302	Electrical and Electronic Circuit Simulation Sessional	1.5
17	EEE 2313	Digital Electronics I	3.0
18	EEE 2314	Digital Electronics I Sessional	1.5
19	EEE 3105	Control Systems	3.0
20	EEE 3106	Control Systems Sessional	1.0
21	EEE 3107	Electromagnetic Fields & Waves	3.0
22	EEE 3209	Computational Methods in Electrical Engineering	3.0
23	EEE 3210	Computational Methods in Electrical Engineering Sessional	1.0
24	EEE 3217	Communication Engineering I	3.0
25	EEE 3218	Communication Engineering I Sessional	1.0
26	EEE 3309	Microprocessor, Interfacing and System design	3.0
27	EEE 3310	Microprocessor, Interfacing and System design Sessional	1.5
28	EEE 3311	Power System I	3.0
29	EEE 3312	Power System I Sessional	1.5
30	EEE 3319	Electrical Properties of Materials	3.0
31	EEE 4000	Project and Thesis	7.0
Total			74.5

1.3.6 Engineering Non-departmental Courses (CSE and ME)

Sl. No.	Course Number	Course Title	Contact Hrs/week	Credits
1	CSE 1221	Computer Programming	3	3.0
2	CSE 1222	Computer Programming Sessional	3	1.5
3	ME 2311	Basic Mechanical Engineering	3	3.0
Total			9	7.5

1.4 Elective Courses

Sl. No.	Course Number	Course Name	Credit
1	EEE 4211	Digital Electronics II	3.0
2	EEE 4213	Digital Signal Processing	3.0
3	EEE 4215	Biomedical Engineering	3.0
4	EEE 4217	Power Plant Engineering and Economy	3.0
5	EEE 4221	Measurement and Instrumentation	3.0
6	EEE 4222	Measurement and Instrumentation Sessional	1.0
7	EEE 4223	High Voltage Engineering	3.0
8	EEE 4224	High Voltage Engineering Sessional	1.0
9	EEE 4225	Renewable Energy	3.0
10	EEE 4226	Renewable Energy Sessional	1.0
11	EEE 4331	VLSI Design	3.0
12	EEE 4332	VLSI Design Sessional	1.0
13	EEE 4333	Power Electronics	3.0
14	EEE 4334	Power Electronics Sessional	1.0
15	EEE 4335	Transducers and Instrumentation	3.0
16	EEE 4336	Transducers and Instrumentation Sessional	1.0
17	EEE 4341	Power System Protection	3.0
18	EEE 4342	Power System Protection Sessional	1.0
19	EEE 4343	Microwave Engineering	3.0
20	EEE 4344	Microwave Engineering Sessional	1.0
21	EEE 4345	Digital Communication	3.0
22	EEE 4346	Digital Communication Sessional	1.0
23	EEE 4347	Antennas and Propagation	3.0
24	EEE 4348	Antennas and Propagation Sessional	1.0

1.5 List of Prerequisite Courses

Sl. No.	Course Number	Prerequisite Course Numbers
1	EEE 1201	EEE 1101
2	EEE 1303	EEE 1101
3	EEE 2103	EEE 1303
4	EEE 2105	EEE 1101
5	EEE 2203	EEE 1303, EEE 2103
6	EEE 2205	EEE 1101, EEE 2105
7	EEE 2313	EEE 1303
8	EEE 3105	EEE 1101, EEE 1201
9	EEE 3107	Math 1201, Math 2101
10	EEE 3109	CSE 1111, CSE 1112
11	EEE 3203	EEE 2313
12	EEE 3309	EEE 2313

Chapter 2**Course Offering****2.1 Semester-wise Course Distribution**

Department will offer the courses to its students, in general, as per the following arrangement:

Year-1

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 1101	Electrical Circuit I	3	3			3.00
2	EEE 1102	Electrical Circuit I Sessional			3	1.50	1.50
3	Phy 1111	Physics I	3	3			3.00
4	Phy 1112	Physics I Sessional			3	1.50	1.50
5	Math 1101	Engg. Mathematics I	3	3			3.00
Total			9	9	6.0	3.00	12.00

Year-1

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 1201	Electrical Circuit II	3	3			3.00
2	EEE 1202	Electrical Circuit II Sessional			3	1.50	1.50
3	CSE 1221	Computer Programming	3	3			3.00
4	CSE 1222	Computer Programming Sessional			3	1.50	1.50
5	Math 1201	Engg. Mathematics II	3	3			3.00
Total			9	9	6.0	3.00	12.00

Year-1

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 1303	Semiconductor Devices	3	3			3.00
2	EEE 1304	Semiconductor Devices Sessional			3	1.50	1.50
5	Phy 1311	Physics II	3	3			3.00
5	Eng 1311	Technical English	3	3			3.00
6	Eng 1312	Technical English Sessional			3	1.50	1.50
Total			9	9	6.00	3.00	12.00

Year-2

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 2103	Electronics I	3	3			3.00
2	EEE 2104	Electronics I Sessional			3	1.50	1.50
3	Chem 2111	Chemistry	3	3			3.00
4	Chem 2112	Chemistry Sessional			3	1.50	1.50
5	Math 2101	Engg. Mathematics III	3	3			3.00
Total			9	9	6.00	3.00	12.00

Year-2

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 2203	Electronics II	3	3			3.00
2	EEE 2204	Electronics II Sessional			3	1.50	1.50
3	EEE 2205	Electrical Machine I	3	3			3.00
4	EEE 2206	Electrical Machine I Sessional			3	1.50	1.50
5	Math 2201	Engg. Mathematics IV	3	3			3.00
Total			9	9	6.00	3.00	12.00

Year-2

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 2301	Signals and Linear Systems	3	3			3.00
3	EEE 2305	Electrical Machine II	3	3			3.00
4	EEE 2306	Electrical Machine II Sessional			3	1.50	1.50
2	EEE 2313	Digital Electronics I	3	3			3.00
3	EEE 2314	Digital Electronics I Sessional			2	1.50	1.50
Total			9	9	6.00	3.00	12.00

Year-3

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
2	EEE 3105	Control Systems	3	3			3.00
3	EEE 3106	Control Systems Sessional			2	1.00	1.00
	EEE 3107	Electromagnetic Fields & Waves	3	3			3.00
	Hum **11	General Education	3	3			3.00
5	Math 3101	Engg. Mathematics V	3	3			3.00
Total			12	12	2.00	1.00	13.00

Year-3

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
	EEE 3207	Electrical Properties of Materials	3	3			3.00
2	EEE 3209	Computational Methods in Electrical Engineering	3	3			3.00
3	EEE 3210	Computational Methods in Electrical Engineering Sessional			2	1.00	1.00
4	EEE 3217	Communication Engineering I	3	3			3.00
5	EEE 3218	Communication Engineering I Sessional			2	1.00	1.00
6	Hum **11	General Education	3	3			3.00
Total			12	12	4.00	2.00	14.00

Year-3

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 3309	Microprocessor, Interfacing and System design	3	3			3.00
2	EEE 3310	Microprocessor, Interfacing and System design Sessional			3	1.50	1.50
3	EEE 3311	Power System I	3	3			3.00
4	EEE 3312	Power System I Sessional			3	1.50	1.50
4	Hum **11	General Education	3	3			3.00
Total			9	9	6.00	3.00	12.00

Year-4

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 4000	Project & Thesis			4	2.00	2.00
5	EEE 4117	Communication Engineering II	3	3			3.00
6	EEE 4118	Communication Engineering II Sessional			2	1.00	1.00
5	ME 4151	Basic Mechanical Engineering	3	3			3.00
	Hum **11	General Education	3	3			3.00
Total			9	9	6.00	3.00	12.00

Year-4

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 4000	Project & Thesis			4	2.00	2.00
	Hum **11	General Education	3	3			3.00
3	EEE ****	Elective I	3	3			3.00
5	EEE ****	Elective II	3	3			3.00
6	EEE ****	Elective II Sessional			2	1.00	1.00
Total			9	9	6.00	3.00	12.00

Year-4

Sl. No	Course No.	Course Title	Theory		Sessional		Total Credits
			Contact Hrs/week	Credits	Contact Hrs/week	Credits	
1	EEE 4000	Project & Thesis			6	3.00	3.00
2	EEE ****	Elective III	3	3			3.00
3	EEE ****	Elective III Sessional			2	1.00	1.00
4	EEE ****	Elective IV	3	3			3.00
5	EEE ****	Elective IV Sessional			2	1.00	1.00
Total			6	6	10.00	5.00	11.00

2.2 Elective Course divisions

Elective I

One Course will be selected from the following
EEE 4211, EEE 4213, EEE 4215, EEE 4217

Sl. No.	Course Number	Course Name	Credit
1	EEE 4211	Digital Electronics II	3.00
2	EEE 4213	Digital Signal Processing	3.00
3	EEE 4215	Biomedical Engineering	3.00
4	EEE 4217	Power Plant Engineering and Economy	3.00

Elective II

One Course will be selected from the following
EEE 4221-4222, EEE 4223-4224, EEE 4225-4226

Sl. No	Course Number	Course Name	Credit
1	EEE 4221	Measurement and Instrumentation	3.00
2	EEE 4222	Measurement and Instrumentation Sessional	1.00
3	EEE 4223	High Voltage Engineering	3.00
4	EEE 4224	High Voltage Engineering Sessional	1.00
5	EEE 4225	Renewable Energy	3.00
6	EEE 4226	Renewable Energy Sessional	1.00

Elective III

One Course will be selected from the following
EEE 4331-4332, EEE 4333-4344, EEE 4335-4336

Sl. No	Course Number	Course Name	Credit
1	EEE 4331	VLSI Design	3.0
2	EEE 4332	VLSI Design Sessional	1.0
3	EEE 4333	Power Electronics	3.0
4	EEE 4334	Power Electronics Sessional	1.0
5	EEE 4335	Transducers and Instrumentation	3.00
6	EEE 4336	Transducers and Instrumentation Sessional	1.00

Elective IV

One Course will be selected from the following
EEE 4341-4342, EEE 4343-4344, EEE 4345-4346, EEE 4347-4348

Sl. No.	Course Number	Course Name	Credit
1	EEE 4341	Power System Protection	3.0
2	EEE 4342	Power System Protection Sessional	1.0
3	EEE 4343	Microwave Engineering	3.00
4	EEE 4344	Microwave Engineering Sessional	1.00
5	EEE 4345	Digital Communication	3.00
6	EEE 4346	Digital Communication Sessional	1.00
7	EEE 4347	Antennas and Propagation	3.00
8	EEE 4348	Antennas and Propagation Sessional	1.00