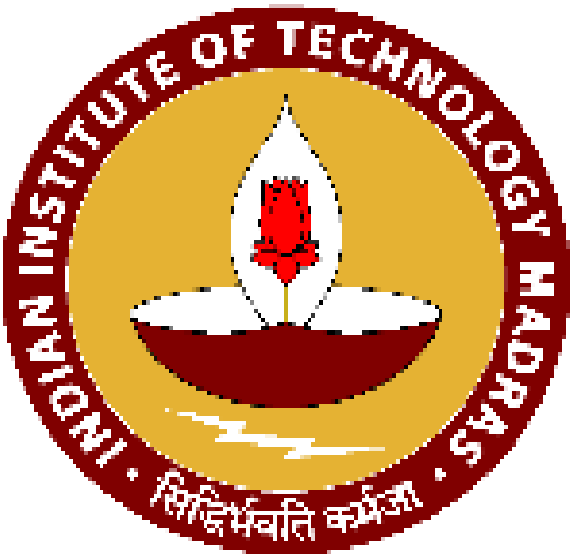



**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**
**CHENNAI 600 036**

# Curriculum for
# B.Tech. Degree Programme
# 2024 Batch

# EE - B.Tech. in Electrical Engineering
# 2024 Batch

## Semester 1

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| **1** | MA1101 | Calculus | 3 | 1 | 0 | 0 | 6 | 10 | S |
| **2** | PH1010 | Physics I | 3 | 1 | 0 | 0 | 6 | 10 | S |
| **3** | EE1102/ EE1103 | Introduction to Programming/Numerical Methods | 2 | 0 | 0 | 3 | 6 | 11 | C |
| **4** | ME1100 | Thermodynamics | 3 | 1 | 0 | 0 | 6 | 10 | E |
| **5** | PH1030 | Physics Lab | 0 | 0 | 0 | 3 | 1 | 4 | S |
| **6** | WS1301 | Workshop I | 0 | 0 | 0 | 3 | 0 | 3 | E |
| **7** | GN1101 | Life Skills | 0 | 0 | 0 | 0 | 4 | 4 | G |
| **8** | ID1300 | Recreation elective | 0 | 0 | 0 | 2 | 0 | 2 | G |
| **9** | GN | NCC (NC1010)/NSO (NS1020)/NSO (NS1030)/NCA | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **56** | |

## Semester 2

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | MA2101 | Linear Algebra via Matrices | 3 | 0 | 0 | 0 | 6 | 9 | S |
| 2 | PH1020 | Physics II (Electromagnetism) | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 3 | EE2002 | Digital Systems | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | EE2702 | Digital Systems Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 5 | EE1101 | Signals & Systems | 3 | 1 | 0 | 0 | 6 | 10 | E |
| **6** | WS1302 | Workshop II | 0 | 0 | 0 | 3 | 0 | 3 | E |
| 7 | GN1102 | Life Skills | 0 | 0 | 0 | 0 | 2 | 2 | G |
| 8 | ID1300 | Recreation elective | 0 | 0 | 0 | 2 | 0 | 2 | G |
| 9 | GN | NCC (NC1010)/NSO (NS1020)/NSO (NS1030)/NCA | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **53** | |

## Semester 3

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE2021 | Materials science for Electrical Engineers | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 2 | EE2015 | Electric Circuits & Networks | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 3 | EE2016 | Microprocessor Theory + Lab | 2 | 0 | 0 | 3 | 6 | 11 | P |
| 4 | EE2703 | Applied Programming Lab | 0 | 0 | 0 | 3 | 2 | 5 | C |
| 5 | MA/ EE3110 | Maths elective/Probability Foundations for Electrical Engineers | 3 | 0 | 0 | 0 | 6 | 9 | S |
| 6 | EE2025 | Engineering Electromagnetics | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 7 | ID1200 | Ecology and Environment | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **57** | |

## Semester 4

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE2007 | Analog Systems | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | EE2707 | Analog Systems Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 3 | EE2004 | Digital Signal Processing | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | EE2006 | Electrical Machines | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 5 | EE2706 | Electrical Machines Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 6 | EE3001 | Solid State Devices | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 7 | Mxxxx | Management elective | 3 | 0 | 0 | 0 | 6 | 9 | M |
| | | **Total Credits :** | | | | | | **59** | |

## Semester 5

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE3004 | Control Engg | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | EE3006 | Principles of Measurement & Lab | 2 | 0 | 0 | 3 | 3 | 8 | P |
| 3 | SE1 | EE Stream Elective-1 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | SE2 | EE Stream Elective-2 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 5 | CY | Chemistry core | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 6 | HSE1 | Humanities Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| 7 | HS3050 | Professional Ethics | 2 | 0 | 0 | 0 | 0 | 2 | G |
| | | **Total Credits :** | | | | | | **59** | |

## Semester 6

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SE3 | EE Stream Elective-3 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | SE4 | EE Stream Elective-4 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 3 | DEP1 | EE dept Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 4 | DEP2 | EE dept Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 5 | HSE2 | Humanities Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| | | **Total Credits :** | | | | | | **47** | |

## Summer

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE3500 | Summer internship | 0 | 0 | 0 | 0 | 20 | 0 | |

***Internship is optional and has no grades**

## Semester 7

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | HSE3 | Humanities Elective 3 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| 2 | DEP3 | EE dept Elective3 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 3 | FE1 | Free Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 4 | FE2 | Free Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| | | **Total Credits :** | | | | | | **36** | |

## Semester 8

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | FE3 | Free Elective 3 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 2 | FE4 | Free Elective 4 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 3 | FE5 | Free Elective 5 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 4 | FE6 | Free Elective 6 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| | | **Total Credits :** | | | | | | **36** | |

| Semester | I | II | III | IV | V | VI | VII | VIII | Total |
|---|---|---|---|---|---|---|---|---|---|
| Credits | 52* | 49* | 48* | 50* | 30* | 0* | 0* | 0* | 403 |

***Please note that the indicated credits are only for core courses. In addition, 174 credits of electives in different categories (as shown in the below table) have to be taken in semesters I-VIII.**

| Category | Engineering (E) and Computing (C) Core+ Elective | Professional (P) Core+ Dept Elective (Stream elective) | Humanities (H) Core+ Elective | Sciences (S) Core+ Elective | Management (M) Core+ Elective | General (G) Core+ Elective | Un-allotted Credits Core+ Elective | Total |
|---|---|---|---|---|---|---|---|---|
| Credits | 42 +0 | 114+67 (40) | 0+27 | 63+9 | 0+9 | 10+8 | 0+54 | 403 |

Electives can be taken in any semester as long as the total credits taken in that semester is less than the maximum credits allowed per semester and if the course pre-requisites are met. One suggestion on how electives can be distributed in various semesters is given above in the semester wise table.

a) At least 9 credits should be from a Management course in M category

b) At least 27 credits should be from HSS courses. Mathematics for Economics whether done offline or online is not considered as a valid HSS course. Humanities elective can be taken in the 6th semester if one isn't planning for semester exchange/long internship.

c) At least 67 elective credits should be from Electrical Engineering courses. All elective lab courses are also eligible.

d) Out of the 67 dept elective credits (mentioned in (c) above), at least 40 credits should be taken from 4 courses in the following EE Stream elective basket. Courses in the stream elective basket other than those chosen to satisfy EE Stream elective requirement can also be taken as general EE electives to satisfy requirement in (c) above.

| | |
|---|---|
| EE2003 Computer Organization | EE3007 RF and Optical Communication |
| EE3002 Analog Circuits | EE5180 Introduction to Machine Learning |
| EE3003 Power Systems | EE3203 Power Electronics |
| EE5312 VLSI Technology | EE3402 Sensing Techniques and Sensor Systems |
| EE5413 Linear Dynamical systems | EE3005 Communication Systems |
| EP3200 Photonics | EE5311 Digital IC Design |

e) At least 9 elective credits should be from one Maths/EE course in S category.

f) Remaining 54 credits can be from any dept. including Electrical Engineering. It may be noted that any combination of free electives should lead to 54 credits and not necessarily 6 courses.

g) Summer internship in the 3rd year is optional and not used to calculate CGPA

**Project**: An optional B.Tech project (BTP) can be taken in lieu of 27 elective credits. BTP can be done in any department including Electrical Engineering. If the BTP is done in the Electrical Engineering department, credits may be counted against the 27 Electrical Engineering department elective credits mentioned above. If the BTP is done with a non-EE faculty member, it will be considered as equivalent to 27 free elective credits.

**UG Research Credits (UGRC)**: UGRC is not mandatory. BTech students can take 27 credit BTP + up to 27 (=3x9 credits) credits of UGRC. If the UGRC is taken under an EE faculty member, it will be placed under the P category. If it is taken in another dept, it will be given E/S/H/C/M category. Please note that the UGRC credits comes out of the 54 unallotted credits and hence cannot be used for fulfilling the 67 credits requirement of dept . electives (item c above)

**On crediting NPTEL & online BS courses:** - Students can do up to 36 credits from NPTEL and online BS programs. One could take all 36 credits from NPTEL or BS program.

- For NPTEL courses, only the credits are transferred. No grade is awarded.
- For online BS courses from IITM, the grades are awarded and counted for CGPA calculation.
- Up to 9 credits from NPTEL can be used for fulfilling H category requirements.
- All other NPTEL and online BS courses will be counted towards the 54 unallotted credits. They will not be used for fulfilling S, E, C, M or P category requirements.

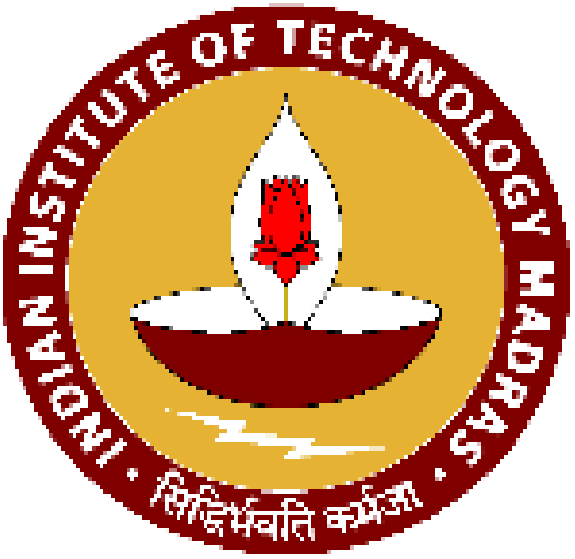
**BTech (Honours):** (Total credit requirement: 403 + 27 = **430)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- ***Extra credit requirement***: 94 department elective credits (instead of 67 for regular B.Tech) to be taken in the Electrical department; 27 of those credits to be at the 5000 level or above.
- ***BTP requirement***: B.Tech project worth 27 credits is mandatory for honors. BTP can be done in any department including Electrical Engineering. If the project is done in the Electrical Engineering department, 27 credits may be counted against the 94 Electrical Engineering department elective credits mentioned above.

**Exit Option for B.Tech : Requirements of Core + Elective credits for each category**

| | **Total Credits** | **S+E+C credits** | **P Credits** |
|---|---|---|---|
| **3-year Engg. Exit Credits** | 242 | 66+4 | 120(70 core)+4* |

***ID1200(2)+HS3050(2)**




**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**
**CHENNAI 600 036**

# Curriculum for
# Dual Degree Programme
# 2024 Batch

# Dual Degree (B.Tech. & M.Tech.) in Electrical Engineering
# 2024-Batch

## Semester 1

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| **1** | MA1101 | Calculus | 3 | 1 | 0 | 0 | 6 | 10 | S |
| **2** | PH1010 | Physics I | 3 | 1 | 0 | 0 | 6 | 10 | S |
| **3** | EE1102/ EE1103 | Introduction to Programming/Numerical Methods | 2 | 0 | 0 | 3 | 6 | 11 | C |
| **4** | ME1100 | Thermodynamics | 3 | 1 | 0 | 0 | 6 | 10 | E |
| **5** | PH1030 | Physics Lab I | 0 | 0 | 0 | 3 | 1 | 4 | S |
| **6** | WS1301 | Workshop I | 0 | 0 | 0 | 3 | 0 | 3 | E |
| **7** | GN1101 | Life Skills | 0 | 0 | 0 | 0 | 4 | 4 | G |
| **8** | ID1300 | Recreation elective | 0 | 0 | 0 | 2 | 0 | 2 | G |
| **9** | GN | NCC (NC1010)/NSO (NS1020)/NSO (NS1030) | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **56** | |

## Semester 2

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | MA2101 | Linear Algebra via Matrices | 3 | 0 | 0 | 0 | 6 | 9 | S |
| 2 | PH1020 | Physics II (Electromagnetism) | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 3 | EE2002 | Digital Systems | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | EE2702 | Digital Systems Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 5 | EE1101 | Signals & Systems | 3 | 1 | 0 | 0 | 6 | 10 | E |
| **6** | WS1302 | Workshop II | 0 | 0 | 0 | 3 | 0 | 3 | E |
| 7 | GN1102 | Life Skills | 0 | 0 | 0 | 0 | 2 | 2 | G |
| 8 | ID1300 | Recreation elective | 0 | 0 | 0 | 2 | 0 | 2 | G |
| 9 | GN | NCC (NC1010)/NSO (NS1020)/NSO (NS1030) | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **53** | |

## Semester 3

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE2021 | Materials science for Electrical Engineers | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 2 | EE2015 | Electric Circuits & Networks | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 3 | EE2016 | Microprocessor Theory + Lab | 2 | 0 | 0 | 3 | 6 | 11 | P |
| 4 | EE2703 | Applied Programming Lab | 0 | 0 | 0 | 3 | 2 | 5 | C |
| 5 | MA/ EE3110 | Maths elective/Probability Foundations for Electrical Engineers | 3 | 0 | 0 | 0 | 6 | 9 | S |
| 6 | EE2025 | Engineering Electromagnetics | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 7 | ID1200 | Ecology and Environment | 0 | 0 | 0 | 0 | 2 | 2 | G |
| | | **Total Credits :** | | | | | | **57** | |

## Semester 4

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE2007 | Analog Systems | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | EE2707 | Analog Systems Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 3 | EE2004 | Digital Signal Processing | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | EE2006 | Electrical Machines | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 5 | EE2706 | Electrical Machines Lab | 0 | 0 | 0 | 3 | 2 | 5 | P |
| 6 | EE3001 | Solid State Devices | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 7 | Mxxxx | Management elective | 3 | 0 | 0 | 0 | 6 | 9 | M |
| | | **Total Credits :** | | | | | | **59** | |

## Semester 5

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE3004 | Control Engg | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | EE3006 | Principles of Measurement & Lab | 2 | 0 | 0 | 3 | 3 | 8 | P |
| 3 | SE1 | EE Stream Elective-1 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 4 | SE2 | EE Stream Elective-2 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 5 | CY | Chemistry Core | 3 | 1 | 0 | 0 | 6 | 10 | S |
| 5 | HSE1 | Humanities Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| 6 | HS3050 | Professional Ethics | 2 | 0 | 0 | 0 | 0 | 2 | G |
| | | **Total Credits :** | | | | | | **59** | |

## Semester 6

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SE3 | EE Stream Elective-3 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 2 | SE4 | EE Stream Elective-4 | 3 | 1 | 0 | 0 | 6 | 10 | P |
| 3 | DEP1 | EE dept Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 4 | DEP2 | EE dept Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 5 | DEP3 | EE dept Elective3 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 5 | HSE2 | Humanities Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| 6 | | **Total Credits :** | | | | | | **56** | |

## Summer

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | EE3500 | Summer internship | 0 | 0 | 0 | 0 | 20 | 0 | |

***Internship is optional and has no grades**

## Semester 7

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | HSE3 | Humanities Elective 3 | 3 | 0 | 0 | 0 | 6 | 9 | H |
| 2 | DEP4 | EE dept Elective4 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 3 | DEP5 | EE dept Elective5 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 4 | FE1 | Free Elective1 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 5 | FE2 | Free Elective2 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| | | **Total Credits :** | | | | | | **45** | |

## Semester 8

| S.No | Course No | Course Name | L | T | E | P | O | C | Cat |
|---|---|---|---|---|---|---|---|---|---|
| 1 | DEP6 | EE dept Elective6 | 3 | 0 | 0 | 0 | 6 | 9 | P |
| 2 | FE3 | Free Elective 3 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 3 | FE4 | Free Elective 4 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 4 | FE5 | Free Elective 5 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| 5 | FE6 | Free Elective 6 | 3 | 0 | 0 | 0 | 6 | 9 | ANY |
| | | **Total Credits :** | | | | | | **45** | |

| Semester | I | II | III | IV | V | VI | VII | VIII | Total |
|---|---|---|---|---|---|---|---|---|---|
| Credits | 52* | 49* | 48* | 50* | 30* | 0* | 0* | 0* | 515 |

***Please note that the indicated credits are only for core program excluding the project in semester IX and X. In addition, 201 credits of electives in different categories (as shown in the below table) have to be taken in semesters I-VIII.**
DD students are required to earn a minimum of 94 credits from dept. electives of which at least 27 credits should be from Elec. Engg. courses at the 5000 level or higher. The stream elective requirements for DD are the same as B.Tech students (see annexure A for B.Tech requirements).

| Category | Engineering (E) and Computing (C) Core+ Elective | Professional (P) Core+ Dept Elective (Stream Elect) +Project | Humanities (H) Core+ Elective | Sciences (S) Core+ Elective | Management (M) Core+ Elective | General Core+ Elective | Un-allotted Credits Core+ Elective | Total |
|---|---|---|---|---|---|---|---|---|
| Credits | 42 +0 | 114+94 (40)+85 | 0+27 | 63+9 | 0+9 | 10+8 | 0+54 | 515 |

Electives can be taken in any semester as long as the total credits taken in that semester is less than the maximum credits allowed per semester and if the course pre-requisites are met. One suggestion on how electives can be distributed in various semesters is given above in the semester wise table.

**DD Project**: DD project can be done under these three options to enable a student to pursue summer internship. The project won't be allowed to extend to the summer after the 10th semester. At the end of the 9th semester, the student should submit a report and make a presentation. The evaluation committee will then recommend whether or not the student is

eligible to continue the project in the 10th semester. If the student is not found eligible, additional course work has to be done so as to meet the total credit requirements for obtaining the Dual degree.

| | Credits completed at the end of the 4th year | Summer | Sem 3 | Sem 4 |
|---|---|---|---|---|
| **Option 1** | >= 403 | Internship | EE6905 (45 credits) + courses | EE6904 (40 credits) |
| **Option2** | | Start project EE6901 (25 credits) | EE6902 (20 credits) + courses | EE6904 (40 credits) |
| **Option 3** | < 403 | Internship | EE6902 (20 credits) + courses | EE6904 (40 credits) |
| **Option 4** | | Start project EE6901 (25 credits) | EE6902 (20 credits) + courses | EE6904 (40 credits) |

**UG Research Credits (UGRC)**: UGRC is not mandatory. DD students can take 85 Credit DDP + 27 credit BTP or 85 Credit DDP + 27 Credit UGRC. If the UGRC is taken under an EE faculty member, it will be placed under the P category. If it is taken in another dept, it will be given E/S/H/C/M category. Please note that the UGRC credits comes out of the 54 unallotted credits and hence cannot be used for partially fulfilling the 54 credits requirement of dept . electives.

**BTech (Honours) + M.Tech program:** (Total credit requirement: 515 + 27 = **542)**

**Eligibility**: Minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.

**Extra credit requirement**: 27 elective credits over and above regular DD program from Elec. Engg. courses at the 5000 level or higher.

## Annexure (A)
## B.Tech. credit requirement

| Semester | I | II | III | IV | V | VI | VII | VIII | Total |
|---|---|---|---|---|---|---|---|---|---|
| Credits | 52* | 49* | 48* | 50* | 30* | 0* | 0* | 0* | 403 |

***Please note that the indicated credits are only for core courses. In addition, 174 credits of electives in different categories (as shown in the below table) have to be taken in semesters I-VIII.**

| Category | Engineering (E) and Computing (C) Core+ Elective | Professional (P) Core+ Dept Elective (Stream Elect) | Humanities (H) Core+ Elective | Sciences (S) Core+ Elective | Management (M) Core+ Elective | General Core+ Elective | Un-allotted Credits Core+ Elective | Total |
|---|---|---|---|---|---|---|---|---|
| Credits | 42 +0 | 114+67 (40) | 0+27 | 63+9 | 0+9 | 10+8 | 0+54 | 403 |

Electives can be taken in any semester as long as the total credits taken in that semester is less than the maximum credits allowed per semester and if the course pre-requisites are met.

a) At least 9 credits should be from a Management course in M category

b) At least 27 credits should be from HSS courses. Mathematics for Economics whether done offline or online is not considered as a valid HSS course. Humanities elective can be taken in the 6th semester if one isn't planning for semester exchange/long internship.

c) At least 67 elective credits should be from Electrical Engineering courses. All elective lab courses are also eligible.

d) Out of the 67 dept elective credits (mentioned in (c) above), at least 40 credits should be taken from 4 courses in the following EE Stream elective basket. Courses in the stream elective basket other than those chosen to satisfy EE Stream elective requirement can also be taken as general EE electives to satisfy requirement in (c) above.

| | |
|---|---|
| EE2003 Computer Organization | EE3007 RF and Optical Communication |
| EE3002 Analog Circuits | EE5180 Introduction to Machine Learning |
| EE3003 Power Systems | EE3203 Power Electronics |
| EE5312 VLSI Technology | EE3402 Sensing Techniques and Sensor Systems |
| EE5413 Linear Dynamical systems | EE3005 Communication Systems |
| EP3200 Photonics | EE5311 Digital IC Design |

e) At least 9 elective credits should be from one Maths/EE course in S category.

f) Remaining 54 credits can be from any dept. including Electrical Engineering. It may be noted that any combination of free electives should lead to 54 credits and not necessarily 6 courses.

g) Summer internship in the 3rd year is optional and not used to calculate CGPA

**Project**: An optional B.Tech project (BTP) can be taken in lieu of 27 elective credits. BTP can be done in any department including Electrical Engineering. If the BTP is done in the Electrical Engineering department, credits may be counted against the 27 Electrical Engineering department elective credits mentioned above. If the BTP is done with a non-EE faculty member, it will be considered as equivalent to 27 free elective credits.

**UG Research Credits (UGRC)**: UGRC is not mandatory. BTech students can take 27 credit BTP + up to 27 (=3x9 credits) credits of UGRC. If the UGRC is taken under an EE faculty member, it will be placed under the P category. If it is taken in another dept, it will be given E/S/H/C/M category. Please note that the UGRC credits comes out of the 54 unallotted credits and hence cannot be used for fulfilling the 67 credits requirement of dept . electives (item c above)

**On crediting NPTEL & online BS courses:** - Students can do up to 36 credits from NPTEL and online BS programs. One could take all 36 credits from NPTEL or BS program.

- For NPTEL courses, only the credits are transferred. No grade is awarded.
- For online BS courses from IITM, the grades are awarded and counted for CGPA calculation.
- Up to 9 credits from NPTEL can be used for fulfilling H category requirements.
- All other NPTEL and online BS courses will be counted towards the 54 unallotted credits. They will not be used for fulfilling S, E, C, M or P category requirements.

**BTech (Honours):** (Total credit requirement: 403 + 27 = **430)**

- ***Eligibility***: minimum CGPA of 8.5 at the end of 5th sem without U or W grade in any course. They need to maintain these conditions until graduation.
- ***Extra credit requirement***: 94 department elective credits (instead of 67 for regular B.Tech) to be taken in the Electrical department; 27 of those credits to be at the 5000 level or above.
- ***BTP requirement***: B.Tech project worth 27 credits is mandatory for honors. BTP can be done in any department including Electrical Engineering. If the project is done in the Electrical Engineering department, 27 credits may be counted against the 94 Electrical Engineering department elective credits mentioned above.