Bharatiya Vidya Bhavan's

**SARDAR PATEL COLLEGE OF ENGINEERING**

(Government Aided Autonomous Institute under Mumbai University)

Andheri (W), Mumbai - 400058

# Third Year B.Tech. in Electrical Engineering with Minor in [****]

## Academic Evaluation Scheme/Credit System

**Year: 2025-2026**

**Regulation 23 (R23)**

**Sardar Patel College of Engineering Andheri (West), Mumbai 400 058**
**Year: 2025-26**

| Scheme for T.Y.B.Tech. In Electrical Engineering with Minor in [****], (Semester - V) R23<br>Academic Year 2025-26 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sr. No.** | **Course Name** | **Code** | **Course Plan per Week (Hrs)** | | | **SLin Hrs/Sem** | **Credits** | **In semester Evaluation (Points)** | | | **End Semester Evaluation (Points)** | | **End semester weightage** | **Total Points** |
| | | | **L** | **T** | **P** | | | **Mid term points** | **Mid term time (Hrs)** | **IE** | **Points** | **Time (Hrs)** | | |
| **Core Courses** | | | | | | | | | | | | | | |
| 1 | Power Electronics | PC-BTE501 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 2 | Control System I | PC-BTE502 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 3 | Electrical Machines II | PC-BTE503 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 4 | Power System Analysis | PC-BTE504 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 5 | Communication Engineering | PC-BTE505 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| **Laboratory Courses** | | | | | | | | | | | | | | |
| 7 | Power Electronics Lab | PC-BTE551 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| 8 | Control System I Lab | PC-BTE552 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| 9 | Electrical Machines II Lab | PC-BTE553 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| 10 | Electrical Simulation Lab | PC-BTE554 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| **Minor Course** | | | | | | | | | | | | | | |
| 11 | Minor II | MI-BT0x2 | 3 | 1 | 0 | 64 | 4 | 30 | | 20 | 100 | 3 | 50% | 100 |
| | **TOTAL** | | 18 | **1** | **8** | | **23** | | | | | | | **800** |

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**Year: 2025-26**

**Scheme for T.Y.B.Tech. In Electrical Engineering with Minor in [****], (Semester - VI) R23**
**Academic Year 2025-26**

| Sr. No. | Course Name | Code | Course Plan per Week (Hrs) | | | SL in Hrs/ semester | Credits | In semester Evaluation (Points) | | | End Semester Evaluation (Points) | | End semester weightage | Total Points |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | L | T | P | | | Mid term points | Mid term time (Hrs) | IE | Points | Time (Hrs) | | |
| **Core Courses** | | | | | | | | | | | | | | |
| 1 | Electric Drives | PC-BTE601 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 2 | Switchgear and Protection | PC-BTE602 | 3 | 0 | 0 | 48 | 3 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| 3 | Control System II | PC-BTE603 | 2 | 0 | 0 | 32 | 2 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| **Laboratory Courses** | | | | | | | | | | | | | | |
| 4 | Electric Drives Lab | PC-BTE651 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| 5 | Switchgear and Protection Lab | PC-BTE652 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| 6 | System Analysis and Design Lab | PC-BTE653 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 25 | 25 | 0 | 100% | 50 |
| **Minor Course** | | | | | | | | | | | | | | |
| 8 | Minor III | MI-BT0x2 | 3 | 1 | 0 | 64 | 4 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| **Professional Elective courses** | | | | | | | | | | | | | | |
| 9 | Professional Elective -I | PE-BTE6xx | 3 | 1 | 0 | 64 | 4 | 30 | 1.5 | 20 | 100 | 3 | 50% | 100 |
| **Community /Field Project** | | | | | | | | | | | | | | |
| 10 | Field Project | FP-BTE601 | 2*+32 | | | | 2 | | | 50 | 50 | | 100% | 100 |
| | **TOTAL** | | 14 | **6** | **6** | | **21** | | | | | | | **750** |

L: Lecture T: Tutorial P: Practical SL: Self Learning

**1 credit corresponds to 30 Hours of student engagement in a semester. Apart from actual contact hours (L T P), the remaining hours are used for term wok and self-learning by students * Contact Hrs.**

***-** Refer Academic Rules.

Evaluation for R23

1. **The Evaluation of any course shall be such that all Course Outcomes are properly mapped.**
2. Mid term: The courses under the category "Theory courses", the evaluation is based on Mid Term of 30 points for 1.5 hours duration. Tentatively the first four modules of the course content will be covered in Mid Term. Any change in the same will be informed by the course instructor. The courses under the category "Skill Enhancement", "Value Education", the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 30 points each.
3. IE: Internal Evaluation will be carried out by the course instructor for 20 points. It is the continuous evaluation throughout the semester. The evaluation will be based on minimum three of the following activities decided by course instructor. The maximum points that can be assigned to one activity will be 07. The course instructor needs to inform the students and head of the department about the activities those will be considered for IE and the points assigned to them in first week of semester. The course instructor will submit the internal evaluation points (out of 20 with activity wise break up) to examination section before the beginning of End Semester examination. List of Activities: 1. Class Involvement 2. Assignments 3. Problem Solving 4. Mini project 5. Quizzes 6. Presentation 7. Oral.
4. End semester evaluation: The course under the category "Theory courses", the evaluation is based on End semester examination of 100 points. The end semester examination will cover all the modules of the course content. The courses under the category "Skill Enhancement", "Value Education", the evaluation is based on activity (Presentation, Test, Mini project, Field project, Practical Examination) of 50/100 points.
5. The evaluation of the laboratory courses include internal evaluation IE of 25 points and End semester evaluation of 25 points. The internal evaluation is based on [10 points: Laboratory Attendance, 15 points: Laboratory work] and End semester evaluation is based on [25 points: Quizes/ Presentation/ Practical Examination/ Mini project/Oral may be any two activities]
6. The co-curricular course credits in semester VIII can be earned through participation in various activities during his/ her graduation. The co-curricular course credits are not considered for CPI calculation.
7. The evaluation of Field project/ Project/ Internship shall be as mentioned in Academic Rules.

**Note: Refer Academic and Examination rules and regulations for further details.**

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## List of Professional Electives

| Professional Elective-I | Professional Elective-II | Professional Elective-III | Professional Elective-IV |
|---|---|---|---|
| **Sem VI** | **Sem VII** | **Sem VII** | **Sem VIII** |
| **ELECTRIC VEHICLES & POWER ELECTRONICS TRACK** | | | |
| Basics of Automotive Systems **PE-BTE601** | Advanced Electric Drives **PE-BTE701** | Vehicular systems and Control of EV drives **PE-BTE721** | Energy storage and Vehicle Management System **PE-BTE801** |
| | Electrical Machine Design **PE-BTE702** | | Modelling and Analysis of Electrical Machine **PE-BTE802** |
| **POWER SYSTEM & POWER ELECTRONICS TRACK** | | | |
| Design of Power Electronics Converters **PE-BTE602** | Power Quality & FACTS **PE-BTE703** | Distributed generation and Micro-grid **PE-BTE722** | Computer Aided Power System Analysis **PE-BTE803** |
| Sensors and Actuators **PE-BTE603** | Restructuring and Deregulation of Power System **PE-BTE704** | High Voltage Engineering **PE-BTE723** | Advanced Techniques in Power System Protection **PE-BTE804** |
| Renewable Energy Sources and grid integration **PE-BTE604** | Design, Management & Audit of Electrical Systems **PE-BTE705** | AI-ML Applications to Electrical Engineering **PE-BTE724** | Smart Grid **PE-BTE805** |
| **CONTROL SYSTEM TRACK** | | | |
| Digital Signal Processing **PE-BTE605** | Embedded System **PE-BTE706** | Digital Control Design **PE-BTE725** | Non-linear control system **PE-BTE806** |
| Artificial Intelligence **PE-BTE606** | | Industrial Automation **PE-BTE726** | Robotics **PE-BTE807** |
| **Multidisciplinary Track** | | | |
| VLSI Circuits **PE-BTE607** | Internet of Things **PE-BTE707** | Computer Architecture **PE-BTE727** | Computer Network **PE-BTE808** |

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## List of Open Electives (To be decided at institute level)

| Open Elective -1 | Open Elective -2 |
|---|---|
| **Sem VII** | **Sem VIII** |
| Image Processing **OE-BTE701** | Engineering Economics **OE-BTE801** |
| Linear Algebra and Matrix Computation **OE-BTE702** | Project Management **OE-BTE802** |
| | |

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**Exit Courses:** The students after FY, SY, TY has to earn extra 6 credits through skill based courses/ Mini project/ internship for claiming UG certificate, UG diploma or B. Vocational respectively. The skill based courses can be selected from the courses offered by National Skill Training Institute with prior approval from the department course committee.

| **Any two courses from the following List or courses approved by department course committee can be selected.** | | |
|---|---|---|
| **Sr. No.** | **Course Name** | **Credits** |
| **First Year of Electrical Engineering** | | |
| 1 | Domestic and Panel wiring | 3 |
| 2 | Solar System installation and maintenance | 3 |
| 3 | Home Automation | 3 |
| 4 | Internship in Electrical industry | 3 |

| **Second / Third Year of Electrical Engineering** | | |
|---|---|---|
| 1 | Domestic and Panel wiring | 3 |
| 2 | Solar System installation and maintenance | 3 |
| 3 | Home Automation | 3 |
| 4 | Power System Transmission and Distribution operation and maintenance | 3 |
| 5 | Cable Jointing | 3 |
| 6 | PLC Programming | 3 |
| 7 | Internship in Electrical industry | 3 |

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Table GATE-MAP

| Sr. No. | Topics from GATE Syllabus | Related Core Courses in Electrical Engineering. Semester |
|---|---|---|
| 1 | Section 1 Engineering Mathematics | Applied Mathematics I, II, III,IV |
| 2 | Section 2 Electric Circuits | Electrical Networks |
| 3 | Section 3 Electromagnetic Fields | Electromagnetic Fields and Waves |
| 4 | Section 4 Signals and Systems | Signals and Systems |
| 5 | Section 5 Electrical Machines | Electrical Machines I and II |
| 6 | Section 6 Power Systems | Power Generation, Transmission and Distribution<br>Power System Analysis<br>Power System Operation and Control |
| 7 | Section 7 Control Systems | Control System I and II |
| 8 | Section 8 Electrical and Electronic Measurements | Electrical and Electronic Measurements |
| 9 | Section 9 Analog and Digital Electronics | Electronic Circuits, Digital Electronics |
| 10 | Section 10 Power Electronics | Power Electronics |