# SCHOOL OF ENGINEERING AND SCIENCES

# B. Tech Electrical and Electronics Engineering

# 2023-27 Batch

## Category Wise Credit Distribution

| Course Sub-category | Subcategory Credits | Category Credits | Learning hours |
|---|---|---|---|
| **Ability Enhancement Courses (AEC)** | | **8** | |
| University AEC | 4 | | **240** |
| School AEC | 4 | | |
| **Value Added Courses (VAC)** | | **8** | |
| University VAC | 4 | | **240** |
| School VAC | 4 | | |
| **Skill Enhancement Courses (SEC)** | | **15** | |
| School SEC | 5 | | **450** |
| Department SEC | 4 | | |
| SEC Elective | 6 | | |
| **Foundation/ Interdisciplinary courses (FIC)** | | **19** | |
| School FIC | 19 | | **570** |
| Department FIC | | | |
| **Core + Core Elective include Specialization (CC)** | | **81** | |
| Core | 67 | | **2430** |
| **Core Elective (Inc Specialization)** | 14 | | |
| **Minor (MC) + Open Elective (OE)** | | **15** | **450** |
| **Research / Design / Internship/ Project (RDIP)** | | **16** | |
| Internship / Design Project / Startup / NGO | 4 | | **480** |
| Internship / Research / Thesis | 12 | | |
| **Total** | | **162** | **4860** |

## Semester Wise Course Credit Distribution Under Various Categories

| Category | Semester | | | | | | | | Total | %age |
|---|---|---|---|---|---|---|---|---|---|---|
| | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | | |
| Ability Enhancement Courses (AEC) | 2 | 2 | 2 | 2 | | | | | 8 | 4.94 |
| Value Added Courses (UG Common) (VAC) | 2 | 2 | | | | 4 | | | 8 | 4.94 |
| Skill Enhancement Courses (SEC) | 2 | 2 | 3 | 2 | 3 | 3 | | | 15 | 9.26 |
| Foundation/ Interdisciplinary courses (FIC) | 13 | 6 | | | | | | | 19 | 11.73 |
| Major Core + Specialization (CC) | | 7 | 15 | 16 | 17 | 18 | 8 | | 81 | 50.00 |
| Minor (MC) + Open Elective (OE) | | | 3 | 3 | 3 | 3 | 3 | | 15 | 9.26 |
| Research / Design / Industrial Practice / Project (RDIP) | | | | | | | 4 | 12 | 16 | 9.88 |
| Grand Total | 19 | 19 | 23 | 23 | 23 | 28 | 15 | 12 | 162 | 100 |

# B. Tech. - Electrical and Electronics Engineering [EEE]

| | | **Semester-1** | | | | | |
|---|---|---|---|---|---|---|---|
| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
| AEC | University AEC | Art of Listening, Speaking and Reading Skills | 1 | 0 | 1 | 2 | 60 |
| VAC | University VAC | Environmental Science | 2 | 0 | 0 | 2 | 60 |
| SEC | School SEC | Analytical Reasoning and Aptitude Skills | 1 | 0 | 1 | 2 | 60 |
| FIC | School FIC | Engineering Physics | 2 | 0 | 1 | 3 | 90 |
| FIC | School FIC | Calculus For Engineers | 3 | 0 | 0 | 3 | 90 |
| FIC | School FIC | Fundamentals of Computing and Programming in C | 3 | 0 | 1 | 4 | 120 |
| FIC | School FIC | Emerging Technologies | 3 | 0 | 0 | 3 | 90 |
| | | | | | **Semester Total** | **19** | **570** |

| | | **Semester-2** | | | | | |
|---|---|---|---|---|---|---|---|
| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
| AEC | University AEC | Effective Writing and Presentation Skills | 1 | 0 | 1 | 2 | 60 |
| VAC | University VAC | Universal Human Values and Ethics | 2 | 0 | 0 | 2 | 60 |
| SEC | School SEC | Entrepreneurial Mindset | 0 | 0 | 2 | 2 | 60 |
| FIC | School FIC | Fundamentals of Chemistry for Engineers | 2 | 0 | 1 | 3 | 90 |
| FIC | School FIC | Linear Algebra and Differential Equations | 3 | 0 | 0 | 3 | 90 |
| CC | Core | Foundations of Electrical and Electronics | 2 | 0 | 1 | 3 | 90 |
| CC | Core | Measurement and Instrumentation | 3 | 0 | 1 | 4 | 120 |
| | | | | | **Semester Total** | **19** | **570** |

**Semester-3**

| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
|----------|--------------|--------------|---|-----|------|---------|----------------|
| AEC | School AEC | Problem Solving Skills | 1 | 0 | 1 | 2 | 60 |
| VAC | School VAC | Co-Curricular Activities | 0 | 0 | 2 | 2* | 60 |
| VAC | School VAC | Community Service and Social Responsibility | 2 | 0 | 0 | 2* | 60 |
| SEC | Department/School SEC | Data Structures | 2 | 0 | 1 | 3 | 90 |
| CC | Core | Circuit Theory | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Electrical Machines-1 | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Electromagnetic Field Theory | 3 | 0 | 0 | 3 | 90 |
| CC | Core | Digital Electronics | 3 | 0 | 1 | 4 | 120 |
| OE/Minor | OE/Minor | | | | | 3 | 90 |
| | | | | **Semester Total** | | **23** | **690** |

**Semester-4**

| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
|----------|--------------|--------------|---|-----|------|---------|----------------|
| AEC | School AEC | Creativity and Critical thinking Skills | 1 | 0 | 1 | 2 | 60 |
| VAC | School VAC | Co-Curricular Activities | 0 | 0 | 2 | 2* | |
| VAC | School VAC | Community Service and Social Responsibility | 2 | 0 | 0 | 2* | |
| SEC | Department/School SEC | Solid State Devices and High Electron Mobility Transistors (HEMTs) | 2 | 0 | 0 | 2 | 60 |
| CC | Core | Power Generation, Transmission and Distribution | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Electrical Machines-II | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Analog Circuits | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Linear Systems and Control Design | 3 | 0 | 1 | 4 | 120 |
| OE/Minor | OE/Minor | | | | | 3 | 90 |
| | | | | **Semester Total** | | **23** | **690** |

| | | **Semester-5** | | | | | |
|---|---|---|---|---|---|---|---|
| **Category** | **Sub-Category** | **Course Title** | **L** | **T/D** | **P/Pr** | **Credits** | **Learning Hours** |
| VAC | School VAC | Co-Curricular Activities | 0 | 0 | 2 | 2* | |
| VAC | School VAC | Community Service and Social Responsibility | 2 | 0 | 0 | 2* | |
| SEC | SEC Elective | Career Skills-1 | | | | 3 | 90 |
| CC | Core | Principles of Signal Processing | 3 | 0 | 0 | 3 | 90 |
| CC | Core | Power System Analysis | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Nonlinear Systems and Control | 2 | 0 | 1 | 3 | 90 |
| CC | Core | Power Electronics | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Microcontrollers and Applications | 2 | 0 | 1 | 3 | 90 |
| OE/Minor | OE/Minor | | | | | 3 | 90 |
| | | | | | **Semester Total** | **23** | **690** |

| | | **Semester-6** | | | | | |
|---|---|---|---|---|---|---|---|
| **Category** | **Sub-Category** | **Course Title** | **L** | **T/D** | **P/Pr** | **Credits** | **Learning Hours** |
| VAC | School VAC | Co-Curricular Activities | 0 | 0 | 2 | 2 | 60 |
| VAC | School VAC | Community Service and Social Responsibility | 2 | 0 | 0 | 2 | 60 |
| SEC | SEC Elective | Career Skills-2 | | | | **3** | 90 |
| CC | Core | High Voltage Engineering | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Switchgear and Protection | 3 | 0 | 1 | 4 | 120 |
| CC | Core | Renewable Energy Sources | 3 | 0 | 1 | 4 | 120 |
| CE/SE | | | | | | 3 | 90 |
| CE/SE | | | | | | 3 | 90 |
| OE/Minor | OE/Minor | | | | | 3 | 90 |
| | | | | | **Semester Total** | **28** | **840** |

| | | Semester-7 | | | | | |
|---|---|---|---|---|---|---|---|
| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
| CE/SE | | | | | | 3 | 90 |
| CE/SE | | | | | | 3 | 90 |
| CE/SE | | | | | | 2 | 60 |
| RDIP | Internship / Research / Thesis | Internship | 0 | 0 | 4 | 4 | 120 |
| OE/Minor | OE/Minor | | | | | 3 | 90 |
| **Semester Total** | | | | | | **15** | **450** |

| | | Semester-8 | | | | | |
|---|---|---|---|---|---|---|---|
| Category | Sub-Category | Course Title | L | T/D | P/Pr | Credits | Learning Hours |
| RDIP | Internship / Research / Thesis | Major Project | 0 | 0 | 12 | 12 | 360 |
| **Semester Total** | | | | | | **12** | **360** |

| **Specialization: Renewable Energy** |
|:---|
| 1    Design of Photovoltaic Systems |
| 2    Wind Energy Systems |
| 3    Power Quality Issues and Mitigation Techniques |
| 4    Renewable Energy Integration with the Grid. |
| 5    Control of Power Converters |
| 6    Microgrids and Energy Management. |

**Courses: Core Electives**

1. Switched Mode Power Converters
2. Power System Operation and Control
3. Numerical Techniques
4. Economics of Power Generation
5. Utilization of Electrical Energy
6. Power Quality Issues and Mitigation Techniques
7. Control of Power Converters
8. Robust and Adaptive Control
9. Modelling and control of battery energy system
10. Electric Vehicle Battery Management System
11. Power Semiconductor Drives
12. Microprocessor and Applications
13. Flexible AC Power Transmission Systems
14. Pulse Power Systems
15. Smart Grid
16. HVDC
17. System Identification and Control
18. Digital Control Systems
19. Electrical Machine Design
20. Digital Signal Processing

**Courses: Minor Program- Smart Grid Technology**

| 1 | Foundations of Smart Grid |
|:---|:---|
| 2 | Alternative Energy Sources |
| 3 | Dynamical Control Systems |
| 4 | Intelligent Energy Management |
| 5 | Energy Storage Technologies |

**Courses: Open Electives**

| 1 | Control Theory and Applications |
|:---|:---|
| 2 | Nuclear Power Generation |
| 3 | Digital Signal Processing |
| 4 | Optimization methods and Machine Learning |
| 5 | Dynamical System Modelling and Control |
| 6 | Electrical Vehicle Technology |
| 7 | Robotics and Control |
| 8 | Digital Control of Power Converters |