#### Scheme of Study (Updated file)

#### BS Electrical Engineering

# Curriculum of BS Electrical Engineering (2020 and onwards)

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| **Updated BSEE Plan of Study 2020** |
| **S. #** | **Course title** | **Cr. Hrs** | **Lab** | **Total** | **Engg.** | **Non Engg.** |
| **Semester 1 (FALL)** |   |   |
| 1 | Linear Circuit Analysis | 3 | 1 | 4 | 4 | 0 |
| 2 | Functional English | 3 | 0 | 3 | 0 | 3 |
| 3 | Calculus | 3 | 0 | 3 | 0 | 3 |
| 4 | Engineering Physics | 2 | 1 | 3 | 0 | 3 |
| 5 | Introduction to Computing | 2 | 1 | 3 | 3 | 0 |
| 6 | Workshop Practice | 0 | 1 | 1 | 1 | 0 |
| **Total Credit Hours**  | **13** | **4** | **17** |   |   |
| **Semester 2 (SPRING)** |   |   |
| 1 | Pakistan Studies | 2 | 0 | 2 | 0 | 2 |
| 2 | Electrical Network Analysis | 3 | 1 | 4 | 4 | 0 |
| 3 | Linear Algebra | 3 | 0 | 3 | 0 | 3 |
| 4 | Communication Skills | 3 | 0 | 3 | 0 | 3 |
| 5 | Intensive Programming | 3 | 1 | 4 | 4 | 0 |
| 6 | Electrochemical Engineering | 3 | 0 | 3 | 2 | 0 |
| **Total Credit Hours**  | **17** | **2** | **19** |   |   |
| **Semester 3 (FALL)** |   |   |
| 1 | Differential Equations | 3 | 0 | 3 | 0 | 3 |
| 2 | Digital Logic Design | 3 | 1 | 4 | 4 | 0 |
| 3 | Electronic Devices & Circuits | 3 | 1 | 4 | 4 | 0 |
| 4 | UE -I/ Social Science Elective-I | 2/3 | 0 | 3 | 0 | 3 |
| 5 | Islamic Studies | 2 | 0 | 2 | 0 | 2 |
| 6 | Computer Aided Engineering Drawing | 0 | 1 | 1 | 1 | 0 |
| **Total Credit Hours** | **14** | **3** | **16/17** |   |   |
| **Semester 4 (SPRING)** |   |   |
| 1 | Electronic Circuit Design | 3 | 1 | 4 | 4 | 0 |
| 2 | Complex Variables and Transforms | 3 | 0 | 3 | 0 | 3 |
| 3 | Embedded Systems | 3 | 1 | 4 | 4 | 0 |
| 4 | UE -II/Social Science Elective-II | 3 | 0 | 3 | 0 | 3 |
| 5 | Applied Thermodynamics (IDEE) | 3 | 1 | 4 | 4 | 0 |
| **Total Credit Hours** | **15** | **2** | **18** |   |   |
| **Semester 5 (FALL)** |   |   |
| 1 | Probability Methods in Engineering | 3 | 0 | 3 | 3 | 0 |
| 2 | Electrical Machines | 3 | 1 | 4 | 4 | 0 |
| 3 | Signals and Systems | 3 | 1 | 4 | 4 | 0 |
| 4 | Instrumentation and Measurements | 3 | 1 | 4 | 4 | 0 |
| 5 | Electromagnetic Theory | 3 | 0 | 3 | 3 | 0 |
| **Total Credit Hours** | **15** | **3** | **18** |   |   |
| **Semester 6 (SPRING)** |   |   |
| 1 | Management Science Elective-I | 3 | 0 | 3 | 0 | 3 |
| 2 | Linear Control Systems | 3 | 1 | 4 | 4 | 0 |
| 3 | Power Electronics | 3 | 1 | 4 | 4 | 0 |
| 4 | Communication Systems | 3 | 1 | 4 | 4 | 0 |
| 5 | Numerical Analysis | 3 | 0 | 3 | 0 | 3 |
| **Total Credit Hours** | **15** | **3** | **18** |   |   |
| **Semester 7 (FALL)** |   |   |
| 1 | Elective-I | 3 | 1 | 4 | 4 | 0 |
| 2 | Elective-II | 3 | 1 | 4 | 4 | 0 |
| 3 | Elective-III | 3 | 0 | 3 | 3 | 0 |
| 4 | Technical Report Writing Skill | 2 | 0 | 2 | 0 | 2 |
| 5 | Final Year Project (Phase -I) | 0 | 2 | 2 | 2 | 0 |
| **Total Credit Hours** | **11** | **4** | **15** |   |   |
| **Semester 8 (SPRING)** |   |   |
| 1 | Final Year Project (Phase -II) | 0 | 4 | 4 | 4 | 0 |
| 2 | Elective -IV | 3 | 1 | 4 | 4 | 0 |
| 3 | Elective -V | 3 | 0 | 3 | 3 | 0 |
| 4 | Management Science Elective-II | 3 | 0 | 3 | 0 | 3 |
| **Total Credit Hours** | **9** | **5** | **14** | **Engg.**  | **Non Engg.** |
| **Program Total Credit Hours**  | **109** | **27** | **136** | 93 | 42 |
|  |  |  |  |  | 69 % | 31 % |

# List of Elective Courses (Depth Electives with Specialization)

The department may offer elective courses from the given lists, but not limited to this list, as per the availability of resources. The elective course to be offered in a semester is on the discretion of the department.

**Power Engineering**

* Power Transmission and Distribution
* Power System Analysis
* Power Generation
* Power System Protection
* Power System operation & Control
* High Voltage Engineering
* Digital Signal Processing
* PLC and Industrial Drives

**Communication Engineering**

* Computer Communication Networks
* Digital Communications
* Digital Signal Processing
* Wireless and Mobile Communications
* Wave Propagation and Antennas
* Satellite Communication
* RF and Microwave Engineering
* Digital Image Processing
* Data Structures and Algorithms
* Machine Learning

**Electronics Engineering**

* Industrial Electronics
* VLSI Design
* Opto-Electronics
* PLC and Industrial Drives
* Digital Control System
* Digital Signal Processing
* RF and Microwave Engineering
* Data Structures and Algorithms
* Machine Learning

**Social Science Electives**

* Professional Ethics
* Introduction to Sociology
* Psychology and Human Behavior
* Any Foreign Language

**Management Science Electives**

* Engineering Economics and Management
* Entrepreneurship
* Project Management
* Leadership and Personal Grooming