



**MEHRAN UNIVERSITY OF ENGINEERING AND  
TECHNOLOGY, JAMSHORO**

**DEPARTMENT OF ELECTRONIC ENGINEERING**

**Revised Curriculum of Bachelor of Engineering (BE)  
Electronic Engineering Program  
October 2024  
Effective from 22ES Batch**

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## 1. Knowledge Area-wise Distribution of BE-Electronic Engineering Scheme

**Table 1: Non-Engineering Courses included in the Electronic Engineering Scheme**

| Knowledge Area                 | Sub Area  | Name of Course                       | Theory Contact Hours | Practical Contact Hours | Credit Hours (CH) | No. of Subjects | Total Credit Hours |
|--------------------------------|-----------|--------------------------------------|----------------------|-------------------------|-------------------|-----------------|--------------------|
| Humanities and Social Sciences | English   | Functional English                   | 3                    | 0                       | 3                 | 3               | 7                  |
|                                |           | Technical and Scientific Writing     | 2                    | 0                       | 2                 |                 |                    |
|                                |           | Communication Skills                 | 2                    | 0                       | 2                 |                 |                    |
|                                | Culture   | Islamic Studies / Ethics             | 2                    | 0                       | 2                 | 2               | 4                  |
|                                |           | Pakistan Studies                     | 2                    | 0                       | 2                 |                 |                    |
|                                | Electives | Professional Ethics                  | 2                    | 0                       | 2                 | 3               | 4                  |
|                                |           | Sociology for Engineers              | 2                    | 0                       | 2                 |                 |                    |
|                                |           | Community Services                   | 0                    | 0                       | 0                 |                 |                    |
| Management Sciences            | Electives | El-I: Engineering Management         | 2                    | 0                       | 2                 | 2               | 5                  |
|                                |           | El-II: Entrepreneurship              | 3                    | 0                       | 3                 |                 |                    |
| Natural Sciences               | Math      | Applied Calculus                     | 3                    | 0                       | 3                 | 4               | 12                 |
|                                |           | Linear Algebra & Analytical Geometry | 3                    | 0                       | 3                 |                 |                    |
|                                |           | Differential Equations               | 3                    | 0                       | 3                 |                 |                    |
|                                |           | Complex Variables and Transforms     | 3                    | 0                       | 3                 |                 |                    |
|                                | Physics   | Applied Physics                      | 3                    | 3                       | 4                 | 1               | 4                  |
|                                | Elective  | Numerical Methods                    | 3                    | 3                       | 4                 | 1               | 4                  |
| Total                          |           |                                      |                      |                         | 40                | 15              | 40<br>(29.62%)     |

**Table 2: Engineering courses included in the Electronic Engineering Scheme**

| Knowledge Area                                                 | Name of Course                                      | Theory Contact Hours | Practical Contact Hours | Credit Hours (CH) | No. of Subjects | Total Credit Hours |
|----------------------------------------------------------------|-----------------------------------------------------|----------------------|-------------------------|-------------------|-----------------|--------------------|
| Computing                                                      | Introduction to Computing                           | 2                    | 3                       | 3                 | 3               | 10                 |
|                                                                | Computer Programming                                | 2                    | 3                       | 3                 |                 |                    |
|                                                                | Elective: Artificial Intelligence in Edge Computing | 3                    | 3                       | 4                 |                 |                    |
| Electronics Engineering Foundation                             | Electronic Workshop                                 | 0                    | 3                       | 1                 | 9               | 25                 |
|                                                                | Basic Electronics                                   | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Electrical Circuits                                 | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Digital Electronics                                 | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Computer Aided Engineering Drawing                  | 0                    | 3                       | 1                 |                 |                    |
|                                                                | Probability and Random Signals                      | 2                    | 0                       | 2                 |                 |                    |
|                                                                | Electromagnetic Fields Theory                       | 2                    | 0                       | 2                 |                 |                    |
|                                                                | Signals and Systems                                 | 2                    | 3                       | 3                 |                 |                    |
|                                                                | Measurement and Instrumentation                     | 3                    | 3                       | 4                 |                 |                    |
| Electronics Engineering Core (Breadth)                         | Communication Systems                               | 3                    | 3                       | 4                 | 7               | 27                 |
|                                                                | Introduction to Embedded Systems                    | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Electrical Machines                                 | 2                    | 3                       | 3                 |                 |                    |
|                                                                | Control Systems                                     | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Breadth Core I: Electronic Circuit Design           | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Breadth Core II: Power Electronics                  | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Breadth Elective-I: Industrial Electronics          | 3                    | 3                       | 4                 |                 |                    |
| Electronics Engineering Specialization Based Electives (Depth) | Depth Elective-I: Integrated Electronics            | 3                    | 3                       | 4                 | 5               | 19                 |
|                                                                | Depth Elective-II: FPGA Based Digital Design        | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Depth Elective-III: Optoelectronics                 | 2                    | 3                       | 3                 |                 |                    |
|                                                                | Depth Elective-IV: Digital Control Systems          | 3                    | 3                       | 4                 |                 |                    |
|                                                                | Depth Elective-VI: Digital                          | 3                    | 3                       | 4                 |                 |                    |

|                              |                                                  |   |   |           |           |                        |
|------------------------------|--------------------------------------------------|---|---|-----------|-----------|------------------------|
|                              | Signal Processing                                |   |   |           |           |                        |
| <b>IDEE</b>                  | IDEE-I: Robotics and Mechatronics Systems Design | 3 | 3 | 4         | 2         | 8                      |
|                              | IDEE-II: Computer Communication & Networks       | 3 | 3 | 4         |           |                        |
| <b>Senior Design Project</b> | Final Year Project-I                             | 0 | 9 | 3         | 2         | 6                      |
|                              | Final Year Project-II                            | 0 | 9 | 3         |           |                        |
| <b>Total</b>                 |                                                  |   |   | <b>95</b> | <b>28</b> | <b>95<br/>(70.37%)</b> |

**Table 3: Summary of Credit Hours and Courses**

|                    | <b>CH<br/>Theory</b> | <b>CH<br/>Practical</b> | <b>Subjects</b> | <b>Credit<br/>Hours</b> |
|--------------------|----------------------|-------------------------|-----------------|-------------------------|
| <b>GRAND TOTAL</b> | <b>103</b>           | <b>32</b>               | <b>44</b>       | <b>135</b>              |

## 2. Semester-wise Breakup of BE-Electronic Engineering Courses

| First Year      |                    |                                      |         |
|-----------------|--------------------|--------------------------------------|---------|
| FIRST SEMESTER  |                    |                                      |         |
| S. No.          | Code               | Title                                | CH      |
| 1               | ENG-101            | Functional English                   | 3+0     |
| 2               | MTH-108            | Applied Calculus                     | 3+0     |
| 3               | EL-116             | Applied Physics                      | 3+1     |
| 4               | EL-120             | Electrical Circuits                  | 3+1     |
| 5               | ES-102             | Electronics Workshop                 | 0+1     |
| 6               | CS-150             | Introduction to Computing            | 2+1     |
| TOTAL           |                    |                                      | 14+4=18 |
| SECOND SEMESTER |                    |                                      |         |
| S. No.          | Code               | Title                                | CH      |
| 7               | MTH-112            | Linear Algebra & Analytical Geometry | 3+0     |
| 8               | CS-113             | Computer Programming                 | 2+1     |
| 9               | ES-112             | Basic Electronics                    | 3+1     |
| 10              | SS-125             | Professional Ethics                  | 2+0     |
| 11              | PS-106             | Pakistan Studies                     | 2+0     |
| 12              | IS- 111<br>/SS-104 | Islamic Studies/Ethics               | 2+0     |
| TOTAL           |                    |                                      | 14+2=16 |

| Second Year     |         |                                         |         |
|-----------------|---------|-----------------------------------------|---------|
| THIRD SEMESTER  |         |                                         |         |
| S. No.          | Code    | Title                                   | CH      |
| 13              | MTH-212 | Differential Equations & Fourier Series | 3+0     |
| 14              | ES-203  | Electronic Circuit Design               | 3+1     |
| 15              | ES-226  | Digital Electronics                     | 3+1     |
| 16              | ES-227  | Measurements & Instrumentation          | 3+1     |
| 17              | ENG-201 | Communication Skills                    | 2+0     |
| 18              | CS-215  | Computer Aided Engineering Design       | 0+1     |
| TOTAL           |         |                                         | 14+4=18 |
| FOURTH SEMESTER |         |                                         |         |
| S. No.          | Code    | Title                                   | CH      |
| 19              | MTH-213 | Complex Variables & Transforms          | 3+0     |
| 20              | EL-202  | Electrical Machines                     | 2+1     |
| 21              | ES-232  | Probability and Random Signals          | 2+0     |
| 22              | ES-244  | Electromagnetic Field Theory            | 2+0     |
| 23              | ES-257  | Integrated Electronics                  | 3+1     |
| 24              | ES-250  | Introduction to Embedded Systems        | 3+1     |
| TOTAL           |         |                                         | 15+3=18 |

| <b>Third Year</b>     |         |                                |         |
|-----------------------|---------|--------------------------------|---------|
| <b>FIFTH SEMESTER</b> |         |                                |         |
| S. No.                | Code    | Title                          | CH      |
| 25                    | ENG-301 | Technical & Scientific Writing | 2+0     |
| 26                    | ENT-315 | Entrepreneurship               | 3+0     |
| 27                    | ES-398  | Signals & Systems              | 2+1     |
| 28                    | ES-319  | Power Electronics              | 3+1     |
| 29                    | MTH-310 | Numerical Methods              | 3+1     |
| TOTAL                 |         |                                | 13+3=16 |
| <b>SIXTH SEMESTER</b> |         |                                |         |
| S. No.                | Code    | Title                          | CH      |
| 30                    | ES-392  | Digital Signal Processing      | 3+1     |
| 31                    | ES-353  | Control Systems                | 3+1     |
| 32                    | SS-336  | Sociology for Engineers        | 2+0     |
| 33                    | ES-373  | FPGA Based Digital Design      | 3+1     |
| 34                    | ES-385  | Communication Systems          | 3+1     |
| 35                    | ES-335  | Community Service              | 0+0     |
| TOTAL                 |         |                                | 14+4=18 |

| <b>Fourth Year</b>      |         |                                           |         |
|-------------------------|---------|-------------------------------------------|---------|
| <b>SEVENTH SEMESTER</b> |         |                                           |         |
| S. No.                  | Code    | Title                                     | CH      |
| 36                      | ES-414  | Digital Control System                    | 3+1     |
| 37                      | INM-491 | Engineering Management                    | 2+0     |
| 38                      | ES-441  | Optoelectronics                           | 2+1     |
| 39                      | CS-450  | Artificial Intelligence in Edge Computing | 3+1     |
| 40                      | ES-498  | Electronic Engineering Project-1          | 0+3     |
| TOTAL                   |         |                                           | 10+6=16 |
| <b>EIGHTH SEMESTER</b>  |         |                                           |         |
| S. No.                  | Code    | Title                                     | CH      |
| 41                      | ES-422  | Robotics and Mechatronic Systems design   | 3+1     |
| 42                      | ES-451  | Industrial Electronics                    | 3+1     |
| 43                      | TL-416  | Computer Communication and Networking     | 3+1     |
| 44                      | ES-499  | Electronic Engineering Project-2          | 0+3     |
| TOTAL                   |         |                                           | 09+6=15 |

### 3. Comparison of Revised vs Existing Semester-wise Breakup of BE-Electronic Engineering Courses

| First Year |                                      |                                      |                           |     |                                             |                                      |         |
|------------|--------------------------------------|--------------------------------------|---------------------------|-----|---------------------------------------------|--------------------------------------|---------|
| Sr.#       | FIRST SEMESTER <i>(Revised 22ES)</i> |                                      |                           |     | FIRST SEMESTER <i>(Existing until 21ES)</i> |                                      |         |
|            | Code                                 | Title                                | Prerequisite Courses      | CH  | Code                                        | Title                                | CH      |
| 1          | ENG-101                              | Functional English                   | Nil                       | 3+1 | ENG-111                                     | Functional English                   | 3+0     |
| 2          | MTH-108                              | Applied Calculus                     | Nil                       | 3+0 | MTH-108                                     | Applied Calculus                     | 3+0     |
| 3          | EL-116                               | Applied Physics                      | Nil                       | 3+1 | EL-116                                      | Applied Physics                      | 3+1     |
| 4          | EL-120                               | Electrical Circuits                  | Nil                       | 3+1 | SS-125                                      | Professional Ethics                  | 2+0     |
| 5          | ES-102                               | Electronics Workshop                 | Nil                       | 0+1 | ES-102                                      | Electronics Workshop                 | 0+1     |
| 6          | CS-150                               | Introduction to Computing            | Nil                       | 2+1 | CS-150                                      | Introduction to Computing            | 2+1     |
| TOTAL      |                                      |                                      | 14+4=18                   |     | TOTAL                                       |                                      | 13+3=16 |
| Sr.#       |                                      |                                      |                           |     |                                             |                                      |         |
|            | Code                                 | Title                                | Prerequisite Courses      | CH  | Code                                        | Title                                | CH      |
| 7          | MTH-112                              | Linear Algebra & Analytical Geometry | Applied Calculus          | 3+0 | MTH-112                                     | Linear Algebra & Analytical Geometry | 3+0     |
| 8          | CS-113                               | Computer Programming                 | Introduction to Computing | 2+1 | CS-113                                      | Computer Programming                 | 2+1     |
| 9          | ES-112                               | Basic Electronics                    | Nil                       | 3+1 | ES-112                                      | Basic Electronics                    | 3+1     |
| 10         | SS-125                               | Professional Ethics                  | Nil                       | 2+0 | EL-107                                      | Electrical Circuits                  | 3+1     |
| 11         | PS-106                               | Pakistan Studies                     | Nil                       | 2+0 | PS-106                                      | Pakistan Studies                     | 2+0     |
| 12         | IS- 111 /SS-104                      | Islamic Studies/Ethics               | Nil                       | 2+0 | IS- 111 /SS-104                             | Islamic Studies/Ethics               | 2+0     |
| TOTAL      |                                      |                                      | 14+2=16                   |     | TOTAL                                       |                                      | 15+3=18 |

| Second Year |                                      |                                         |                                                        |     |                                             |                                         |      |         |
|-------------|--------------------------------------|-----------------------------------------|--------------------------------------------------------|-----|---------------------------------------------|-----------------------------------------|------|---------|
| Sr.#        | THIRD SEMESTER <i>(Revised 22ES)</i> |                                         |                                                        |     | THRID SEMESTER <i>(Existing until 21ES)</i> |                                         |      |         |
|             | Code                                 | Title                                   | Prerequisite Courses                                   | CH  | Code                                        | Title                                   | CH   |         |
| 13          | MTH-212                              | Differential Equations & Fourier Series | Applied Calculus, Linear Algebra & Analytical Geometry | 3+0 | MTH-212                                     | Differential Equations & Fourier Series | 3+0  |         |
| 14          | ES-203                               | Electronic Circuit Design               | Basic Electronics                                      | 3+1 | ES-203                                      | Electronic Circuit Design               | 3+1  |         |
| 15          | ES-226                               | Digital Electronics                     | Nil                                                    | 3+1 | ES-225                                      | Digital Electronics                     | 30+1 |         |
| 16          | ES-227                               | Measurements & Instrumentation          | Nil                                                    | 3+1 | ES-223                                      | Measurements & Instrumentation          | 3+1  |         |
| 17          | ENG-201                              | Communication Skills                    | Functional English                                     | 2+0 | INM-291                                     | Engineering Management                  | 2+0  |         |
| 18          | CS-215                               | Computer Aided Engineering Design       | Introduction to Computing, Computer Programming        | 0+1 | CS-215                                      | Computer Aided Engineering Design       | 0+1  |         |
| TOTAL       |                                      |                                         | 14+4=18                                                |     | TOTAL                                       |                                         |      | 14+4=18 |

| Sr.#  | FOURTH SEMESTER (Revised 22ES) |                                  |                                                        |     | FOURTH SEMESTER (Existing until 21ES) |                                |         |
|-------|--------------------------------|----------------------------------|--------------------------------------------------------|-----|---------------------------------------|--------------------------------|---------|
|       | Code                           | Title                            | Prerequisite Courses                                   | CH  | Code                                  | Title                          | CH      |
| 19    | MTH-213                        | Complex Variables & Transforms   | Applied Calculus, Linear Algebra & Analytical Geometry | 3+0 | MTH-213                               | Complex Variables & Transforms | 3+0     |
| 20    | EL-202                         | Electrical Machines              | Applied Physics                                        | 2+1 | EL-202                                | Electrical Machines            | 2+1     |
| 21    | ES-232                         | Probability and Random Signals   | Nil                                                    | 2+0 | ENG-201                               | Communication Skills           | 2+0     |
| 22    | ES-244                         | Electromagnetic Field Theory     | Linear Algebra & Analytical Geometry, Applied Physics  | 2+0 | ES-243                                | Electromagnetic Field          | 3+0     |
| 23    | ES-257                         | Integrated Electronics           | Electronic Circuit Design                              | 3+1 | ES-253                                | Integrated Electronics         | 3+1     |
| 24    | ES-250                         | Introduction to Embedded Systems | Digital Electronics                                    | 3+1 |                                       |                                |         |
| TOTAL |                                |                                  | 15+3=18                                                |     | TOTAL                                 |                                | 13+2=15 |

| Third Year |                               |                                |                                                     |         |                                      |                                  |         |
|------------|-------------------------------|--------------------------------|-----------------------------------------------------|---------|--------------------------------------|----------------------------------|---------|
| Sr.#       | FIFTH SEMESTER (Revised 22ES) |                                |                                                     |         | FIFTH SEMESTER (Existing until 21ES) |                                  |         |
|            | Code                          | Title                          | Prerequisite Courses                                | CH      | Code                                 | Title                            | CH      |
| 25         | ENG-301                       | Technical & Scientific Writing | Nil                                                 | 2+0     | SS-338                               | Sociology for Engineers          | 2+0     |
| 26         | ENT-315                       | Entrepreneurship               | Nil                                                 | 3+0     | ES-314                               | Introduction to Embedded Systems | 3+1     |
| 27         | ES-398                        | Signals & Systems              | Electrical Circuits, Complex Variables & Transforms | 2+1     | ES-304                               | Signals & Systems                | 3+1     |
| 28         | ES-319                        | Power Electronics              | Basic Electronics                                   | 3+1     | ES-319                               | Power Electronics                | 3+1     |
| 29         | MTH-310                       | Numerical Methods              | Nil                                                 | 3+1     | MTH-310                              | Numerical Methods                | 3+1     |
| TOTAL      |                               |                                |                                                     | 13+3=17 | TOTAL                                |                                  | 14+4=18 |

| Sr.#  | SIXTH SEMESTER <i>(Revised 22ES)</i> |                           |                                                     |         | SIXTH SEMESTER <i>(Existing until 21ES)</i> |                                |         |
|-------|--------------------------------------|---------------------------|-----------------------------------------------------|---------|---------------------------------------------|--------------------------------|---------|
|       | Code                                 | Title                     | Prerequisite Courses                                | CH      | Code                                        | Title                          | CH      |
| 30    | ES-392                               | Digital Signal Processing | Signal & Systems                                    | 3+1     | ES-385                                      | Communication Systems          | 3+1     |
| 31    | ES-353                               | Control Systems           | Complex Variables & Transforms, Signals and Systems | 3+1     | ES-353                                      | Control System                 | 3+1     |
| 32    | SS-336                               | Sociology for Engineers   | Nil                                                 | 2+0     | ES-324                                      | Probability and Random Signals | 3+0     |
| 33    | ES-373                               | FPGA Based Digital Design | Digital Electronics                                 | 3+1     | ES-373                                      | FPGA Based Digital Design      | 3+1     |
| 34    | ES-385                               | Communication Systems     | Signal & Systems                                    | 3+1     | ES-397                                      | Optoelectronics                | 2+1     |
| 35    | ES-335                               | Community Service         | Nil                                                 | 0+0     |                                             |                                |         |
| TOTAL |                                      |                           |                                                     | 14+4=15 | TOTAL                                       |                                | 14+4=18 |

| Fourth Year |                                 |                                           |                                                  |         |                                        |                                                |         |
|-------------|---------------------------------|-------------------------------------------|--------------------------------------------------|---------|----------------------------------------|------------------------------------------------|---------|
| Sr.#        | SEVENTH SEMESTER (Revised 22ES) |                                           |                                                  |         | SEVENTH SEMESTER (Existing until 21ES) |                                                |         |
|             | Code                            | Title                                     | Prerequisite Courses                             | CH      | Code                                   | Title                                          | CH      |
| 36          | ES-414                          | Digital Control System                    | Control Systems                                  | 3+1     | ES-413                                 | Digital Control System                         | 3+1     |
| 37          | INM-412                         | Engineering Management                    | Nil                                              | 2+0     | ES-423                                 | Embedded Systems Design                        | 3+1     |
| 38          | ES-441                          | Optoelectronics                           | Applied Physics                                  | 2+1     | ENG-401                                | Technical Report Writing & Presentation Skills | 2+0     |
| 39          | CS-450                          | Artificial Intelligence in Edge Computing | Introduction to Embedded Systems                 | 3+1     | TL-416                                 | Computer Communication & Networking            | 3+1     |
| 40          | ES-498                          | Electronic Engineering Project-1          |                                                  | 0+3     | ES-498                                 | Electronic Engineering Project-1               | 0+3     |
| TOTAL       |                                 |                                           |                                                  | 10+6=16 | TOTAL                                  |                                                | 11+6    |
| Sr.#        | EIGHTH SEMESTER (Revised 22ES)  |                                           |                                                  |         | EIGHTH SEMESTER (Existing until 21ES)  |                                                |         |
|             | Code                            | Title                                     | Prerequisite Courses                             | CH      | Code                                   | Title                                          | CH      |
| 41          | ES-451                          | Industrial Electronics                    | Power electronics                                | 2+0     | SS-411                                 | Entrepreneurship                               | 3+0     |
| 42          | ES-422                          | Robotics and Mechatronic Systems design   | Control Systems, Introduction to Embedded System | 3+1     | ES-451                                 | Mechatronic Systems and Applications           | 3+0     |
| 43          | TL-416                          | Computer Communication and Networking     | Communication Systems                            | 3+1     | CS-490                                 | Artificial Intelligence                        | 3+1     |
|             |                                 |                                           |                                                  |         | ES-433                                 | Digital Signal Processing                      | 3+1     |
| 44          | ES-499                          | Electronic Engineering Project-2          |                                                  | 0+3     | ES-499                                 | Electronic Engineering Project-2               | 0+3     |
| TOTAL       |                                 |                                           |                                                  | 11+6=17 | TOTAL                                  |                                                | 12+5=17 |