



**COURSE STRUCTURE**

**B. TECH – ELECTRONICS AND COMMUNICATION ENGINEERING**

REGULATIONS: MLR2020

| <b>I YEAR I SEMESTER</b>             |   |          |                  |           |           |           |                                     |            |            |
|--------------------------------------|---|----------|------------------|-----------|-----------|-----------|-------------------------------------|------------|------------|
| Code                                 | Course  | Category | Periods per Week |           |           | Credits   | Scheme of Examination Maximum Marks |            |            |
|                                      |   |          | L                | T         | P         |           | Internal                            | External   | Total      |
| A5BS01                               | Calculus and Applications                                 | BSC      | 3                | 1         | 0         | 4         | 30                                  | 70         | 100        |
| A5BS12                               | Chemistry of Materials                                    | BSC      | 4                | 0         | 0         | 4         | 30                                  | 70         | 100        |
| A5CS01                               | Programming for Problem Solving                           | ESC      | 3                | 0         | 0         | 3         | 30                                  | 70         | 100        |
| A5HS01                               | Communicative English                                     | HSMC     | 2                | 0         | 0         | 2         | 30                                  | 70         | 100        |
| A5CS02                               | Programming for Problem Solving Laboratory                | ESC      | 0                | 0         | 4         | 2         | 30                                  | 70         | 100        |
| A5BS14                               | Engineering Chemistry Laboratory                          | BSC      | 0                | 0         | 3         | 2         | 30                                  | 70         | 100        |
| A5HS02                               | English Language and Communication Skills Laboratory      | HSMC     | 0                | 0         | 3         | 2         | 30                                  | 70         | 100        |
| <b>TOTAL</b>                         |   |          | <b>12</b>        | <b>01</b> | <b>10</b> | <b>19</b> | <b>210</b>                          | <b>490</b> | <b>700</b> |
| <b>Mandatory Course (Non-Credit)</b> |   |          |                  |           |           |           |                                     |            |            |
| A5MC01                               | Technical Seminar-I                                       |          | 0                | 0         | 2         | 0         | 30                                  | 70         | 100        |
| <b>I YEAR II SEMESTER</b>            |   |          |                  |           |           |           |                                     |            |            |
| Code                                 | Course  | Category | Periods per Week |           |           | Credits   | Scheme of Examination Maximum Marks |            |            |
|                                      |   |          | L                | T         | P         |           | Internal                            | External   | Total      |
| A5BS03                               | Integral Calculus and Numerical Techniques                | BSC      | 3                | 1         | 0         | 4         | 30                                  | 70         | 100        |
| A5BS09                               | Fundamentals of electronic materials and its applications | BSC      | 3                | 1         | 0         | 4         | 30                                  | 70         | 100        |
| A5EE03                               | Electrical Technology                                     | ESC      | 3                | 1         | 0         | 4         | 30                                  | 70         | 100        |
| A5AE70                               | Engineering Graphics-CAD                                  | ESC      | 1                | 0         | 4         | 3         | 30                                  | 70         | 100        |
| A5BS11                               | Engineering Physics Laboratory                            | BSC      | 0                | 0         | 3         | 2         | 30                                  | 70         | 100        |
| A5EE04                               | Electrical Technology Laboratory                          | ESC      | 0                | 0         | 3         | 2         | 30                                  | 70         | 100        |
| A5AE71                               | Engineering Workshop                                      | ESC      | 0                | 0         | 2         | 1         | 30                                  | 70         | 100        |
| <b>TOTAL</b>                         |   |          | <b>10</b>        | <b>03</b> | <b>12</b> | <b>20</b> | <b>210</b>                          | <b>490</b> | <b>700</b> |
| <b>Mandatory Course (Non-Credit)</b> |   |          |                  |           |           |           |                                     |            |            |
| A5MC02                               | Technical Seminar-II                                      |          | 0                | 0         | 2         | 0         | 30                                  | 70         | 100        |

## II YEAR I SEMESTER

| Code                                 | Course                                      | Category | Periods per Week |          |          | Credits   | Scheme of Examination<br>Maximum Marks |            |            |
|--------------------------------------|---|----------|------------------|----------|----------|-----------|--|------------|------------|
|                                      |   |          | L                | T        | P        |           | Internal                               | External   | Total      |
| A5EC02                               | Electronic Devices and circuits             | ESC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC03                               | Digital Logic Design                        | PCC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC04                               | Signals and Systems                         | PCC      | 3                | 1        | 0        | 4         | 30                                     | 70         | 100        |
| A5IT03                               | Python Programming                          | ESC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC05                               | Probability Theory and Stochastic Processes | ESC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC06                               | Internet of Things Lab                      | ESC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| A5EC07                               | Electronics Devices and Digital logic Lab   | ESC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| A5EC08                               | Basic Simulation Lab                        | BSC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| <b>TOTAL</b>                         |   |          | <b>15</b>        | <b>1</b> | <b>9</b> | <b>22</b> | <b>240</b>                             | <b>560</b> | <b>800</b> |
| <b>Mandatory Course (Non-Credit)</b> |   |          |                  |          |          |           |  |            |            |
| A5HS03                               | Gender sensitization                        |          | 2                | 0        | 0        | -         | 30                                     | 70         | 100        |

## II YEAR II SEMESTER

| Code                                 | Course                                 | Category | Periods per Week |          |          | Credits   | Scheme of Examination<br>Maximum Marks |            |            |
|--------------------------------------|--|----------|------------------|----------|----------|-----------|--|------------|------------|
|                                      |  |          | L                | T        | P        |           | Internal                               | External   | Total      |
| A5CS03                               | Data Structures                        | ESC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC09                               | Analog and Digital Communication       | PCC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC10                               | Analog Circuits                        | PCC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5BS07                               | Vector Calculus And Complex Analysis   | ESC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC11                               | Electromagnetic and Transmission Lines | PCC      | 3                | 0        | 0        | 3         | 30                                     | 70         | 100        |
| A5EC12                               | Analog Circuits Lab                    | PCC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| A5CS04                               | Data Structures Lab                    | ESC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| A5EC13                               | Analog and Digital Communications Lab  | PCC      | 0                | 0        | 3        | 2         | 30                                     | 70         | 100        |
| <b>TOTAL</b>                         |  |          | <b>15</b>        | <b>0</b> | <b>9</b> | <b>21</b> | <b>240</b>                             | <b>560</b> | <b>800</b> |
| <b>Mandatory Course (Non-Credit)</b> |  |          |                  |          |          |           |  |            |            |
| A5MC01                               | Environmental Science                  |          | 3                | 0        | 0        | -         | 30                                     | 70         | 100        |

### III YEAR I SEMESTER

| Code         | Course  | Category | Periods per Week |          |           | Credits   | Scheme of Examination Maximum Marks |            |            |
|--------------|---|----------|------------------|----------|-----------|-----------|-------------------------------------|------------|------------|
|              |   |          | L                | T        | P         |           | Internal                            | External   | Total      |
| A5EC14       | Linear IC Applications                                | PCC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC15       | Digital Integrated Circuit Applications using Verilog | PCC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC16       | Antennas and Micro Wave Engineering                   | PCC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|              | Professional Elective – 1                             | PEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|              | Open Elective-1                                       | OEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC17       | Antennas and Microwave Engineering Lab                | PCC      | 0                | 0        | 3         | 2         | 30                                  | 70         | 100        |
| A5EC18       | Linear & Digital IC Applications Lab                  | PCC      | 0                | 0        | 3         | 2         | 30                                  | 70         | 100        |
| A5IT02       | Object Oriented Programming Lab                       | PCC      | 0                | 0        | 3         | 2         | 30                                  | 70         | 100        |
| A5EC19       | Internship /Certifications*                           | PWC      | 0                | 0        | 4         | 2         | 100                                 | -          | 100        |
| <b>TOTAL</b> |   |          | <b>15</b>        | <b>0</b> | <b>13</b> | <b>23</b> | <b>340</b>                          | <b>560</b> | <b>900</b> |

### III YEAR II SEMESTER

| Code         | Course                                    | Category | Periods per Week |          |          | Credits   | Scheme of Examination Maximum Marks |            |            |
|--------------|---|----------|------------------|----------|----------|-----------|-------------------------------------|------------|------------|
|              |   |          | L                | T        | P        |           | Internal                            | External   | Total      |
| A5EC20       | Digital Signal Processing                 | PCC      | 3                | 0        | 0        | 3         | 30                                  | 70         | 100        |
| A5EC21       | Microprocessors and Microcontrollers      | PCC      | 3                | 0        | 0        | 3         | 30                                  | 70         | 100        |
|              | Professional Elective – 2                 | PCC      | 3                | 0        | 0        | 3         | 30                                  | 70         | 100        |
|              | Professional Elective – 3                 | PEC      | 3                | 0        | 0        | 3         | 30                                  | 70         | 100        |
|              | Open Elective-2                           | OEC      | 3                | 0        | 0        | 3         | 30                                  | 70         | 100        |
| A5EC22       | Signal Processing and Computer Vision Lab | PCC      | 0                | 0        | 3        | 2         | 30                                  | 70         | 100        |
| A5EC23       | Microprocessors and Microcontrollers Lab  | PCC      | 0                | 0        | 3        | 2         | 30                                  | 70         | 100        |
| A5EC24       | Artificial intelligence Lab               | PCC      | 0                | 0        | 3        | 2         | 30                                  | 70         | 100        |
| A5EC25       | Comprehensive viva                        | PWC      | -                | -        | -        | 1         | 100                                 | -          | 100        |
| <b>TOTAL</b> |   |          | <b>15</b>        | <b>0</b> | <b>9</b> | <b>22</b> | <b>340</b>                          | <b>560</b> | <b>900</b> |

| IV YEAR I SEMESTER  |                            |          |                  |          |           |           |                                     |            |            |
|---------------------|----------------------------|----------|------------------|----------|-----------|-----------|-------------------------------------|------------|------------|
| Code                | Course                     | Category | Periods per Week |          |           | Credits   | Scheme of Examination Maximum Marks |            |            |
|                     |                            |          | L                | T        | P         |           | Internal                            | External   | Total      |
| A5EC26              | Embedded System Design     | PCC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC27              | VLSI Design                | PCC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|                     | Professional Elective -4   | PEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|                     | Open Elective-3            | OEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC28              | Embedded System Design Lab | PCC      | 0                | 0        | 3         | 2         | 30                                  | 70         | 100        |
| A5EC29              | VLSI Design Lab            | PCC      | 0                | 0        | 3         | 2         | 30                                  | 70         | 100        |
| A5EC30              | Project Stage-I            | PWC      | 0                | 0        | 8         | 4         | 100                                 | 0          | 100        |
| <b>TOTAL</b>        |                            |          | <b>12</b>        | <b>0</b> | <b>14</b> | <b>20</b> | <b>280</b>                          | <b>420</b> | <b>700</b> |
| IV YEAR II SEMESTER |                            |          |                  |          |           |           |                                     |            |            |
| Code                | Course                     | Category | Periods per Week |          |           | Credits   | Scheme of Examination Maximum Marks |            |            |
|                     |                            |          | L                | T        | P         |           | Internal                            | External   | Total      |
|                     | Professional Elective -5   | PEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|                     | Professional Elective -6   | PEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
|                     | Open Elective-4            | OEC      | 3                | 0        | 0         | 3         | 30                                  | 70         | 100        |
| A5EC31              | Project Stage-II           | PWC      | 0                | 0        | 16        | 8         | 50                                  | 150        | 200        |
| <b>TOTAL</b>        |                            |          | <b>9</b>         | <b>0</b> | <b>16</b> | <b>17</b> | <b>140</b>                          | <b>360</b> | <b>500</b> |

**Note:**

**BSC- Basic Science Courses**

**ESC-Engineering Science Courses**

**HSMC-Humanities and Social Science including Management Courses**

**PCC- Professional Core Courses**

**PEC- Program Elective Courses**

**OEC- Open Elective Courses**

**PWC- Project work Related Courses**

**MC- Mandatory Courses**

| PROFESSIONAL ELECTIVES |  |               |                                      |
|------------------------|--|---------------|--------------------------------------|
| PE-I                   |  | PE-II         |                                      |
| <b>A5EC32</b>          | Electronic Measurements and Instruments  | <b>A5EC36</b> | Digital Image Processing             |
| <b>A5EC33</b>          | Artificial Intelligence                  | <b>A5EC37</b> | Fiber Optic Communication            |
| <b>A5EC34</b>          | Opto Electronics                         | <b>A5EC38</b> | Introduction to MEMS                 |
| <b>A5EC35</b>          | Speech and Audio Processing              | <b>A5CS25</b> | Data Mining                          |
| PE-III                 |  | PE-IV         |                                      |
| <b>A5EC39</b>          | Control Systems                          | <b>A5EC42</b> | Satellite Communication              |
| <b>A5EC40</b>          | Telecommunication Switching and Networks | <b>A5EC43</b> | Introduction to Computer Networks    |
| <b>A5EC41</b>          | ASIC Design                              | <b>A5EC44</b> | Robotics and Automation              |
| <b>A5IT08</b>          | Machine Learning                         | <b>A5EC45</b> | Artificial Neural Networks           |
| PE- V                  |  | PE-VI         |                                      |
| <b>A5EC46</b>          | Cellular Mobile Communications           | <b>A5EC49</b> | Radar Systems                        |
| <b>A5EC47</b>          | Television Engineering                   | <b>A5EC50</b> | Wireless Communications and Networks |
| <b>A5EC48</b>          | CMOS Analog Design                       | <b>A5EC51</b> | Internet of Things & Applications    |
| <b>A5AI04</b>          | Deep Learning                            | <b>A5EC52</b> | VLSI Signal Processing               |

## OPEN ELECTIVE COURSES

| <b>OPEN ELECTIVE COURSE-I</b> |                    |   |   |
|-------------------------------|--------------------|---|---|
| <b>S. No.</b>                 | <b>Course Code</b> | <b>Course Name</b>                        | <b>Offering Department</b>              |
| 1.                            | A5AE61             | Fabrication Processes                     | Aeronautical Engineering                |
| 2.                            | A5AE62             | Fundamentals of Avionics                  |   |
| 3.                            | A5AE63             | Principles of Flight                      |   |
| 4.                            | A5CS37             | Core Java Programming                     | Computer Science and Engineering        |
| 5.                            | A5CS26             | Software Engineering                      |   |
| 6.                            | A5CS23             | Data Analytics                            |   |
| 7.                            | A5EC53             | Logic Design                              | Electronics & Communication Engineering |
| 8.                            | A5EC54             | Principles of Communications              |   |
| 9.                            | A5EC55             | Measurements and Instruments              |   |
| 10.                           | A5EE53             | Electrical Wiring and Safety Measures     | Electrical & Electronics Engineering    |
| 11.                           | A5EE54             | Electrical Materials                      |   |
| 12.                           | A5EE55             | New trends in Electrical Energy           |   |
| 13.                           | A5IT20             | Fundamentals of Data Structures           | Information Technology                  |
| 14.                           | A5IT27             | Software Engineering Principles           |   |
| 15.                           | A5IT28             | Operating System Principles               |   |
| 16.                           | A5ME71             | Elements Of Mechanical Engineering        | Mechanical Engineering                  |
| 17.                           | A5ME72             | Fundamentals Of Engineering Materials     |   |
| 18.                           | A5SH06             | Business Economics and Financial Analysis | Humanities and Science                  |
| 19.                           | A5HS07             | Basics of Entrepreneurship                |   |
| 20.                           | A5HS08             | Human Values and Professional Ethics      |   |

| OPEN ELECTIVE COURSE-II |             |  |   |
|-------------------------|-------------|--|---|
| S. No.                  | Course Code | Course Name  | Offering Department                     |
| 1.                      | A5AE64      | Introduction to Aircraft Industry                    | Aeronautical Engineering                |
| 2.                      | A5AE65      | Non-Destructive Testing Methods                      |   |
| 3.                      | A5AE66      | Fundamentals of Finite Element Method                |   |
| 4.                      | A5CS38      | Fundamentals of DBMS                                 | Computer Science and Engineering        |
| 5.                      | A5CS35      | Introduction to Machine Learning                     |   |
| 6.                      | A5CS09      | Design & Analysis of Algorithms                      |   |
| 7.                      | A5EC56      | Fundamentals of Integrated Circuits                  | Electronics & Communication Engineering |
| 8.                      | A5EC57      | Introduction of Microprocessors and Microcontrollers |   |
| 9.                      | A5EC58      | Fundamentals of VLSI Design                          |   |
| 10.                     | A5EE56      | Power Plant Engineering                              | Electrical & Electronics Engineering    |
| 11.                     | A5EE57      | Analysis of Linear Systems                           |   |
| 12.                     | A5EE58      | Neural Networks and Fuzzy Logic                      |   |
| 13.                     | A5IT29      | Basics of Python Programming                         | Information Technology                  |
| 14.                     | A5IT30      | Human Computer Interaction                           |   |
| 15.                     | A5IT31      | Software Testing Fundamentals                        |   |
| 16.                     | A5ME73      | Fundamentals of Mechatronics                         | Mechanical Engineering                  |
| 17.                     | A5ME74      | Basics Of Thermodynamics                             |   |
| 18.                     | A5HS09      | Advanced Entrepreneurship                            | Humanities and Science                  |

| OPEN ELECTIVE COURSE-III |             |   |   |
|--------------------------|-------------|---|---|
| S. No.                   | Course Code | Course Name                                 | Offering Department                     |
| 1.                       | A5AE67      | Unmanned Aerial Vehicles                    | Aeronautical Engineering                |
| 2.                       | A5AE68      | Fundamentals of Wind Power Technology       |   |
| 3.                       | A5AE69      | Introduction to Wind Tunnel Techniques      |   |
| 4.                       | A5CS39      | Introduction to Cloud Computing             | Computer Science and Engineering        |
| 5.                       | A5CS40      | Computer Organization and Operating Systems |   |
| 6.                       | A5CS32      | Agile Software Development                  |   |
| 7.                       | A5EC59      | Signal Transmission through linear systems  | Electronics & Communication Engineering |
| 8.                       | A5EC60      | Fundamentals of Image processing            |   |
| 9.                       | A5EC61      | TV Engineering                              |   |
| 10.                      | A5EE59      | Fundamentals of Illumination Engineering    | Electrical & Electronics Engineering    |
| 11.                      | A5EE60      | Non-Conventional Power Generation           |   |
| 12.                      | A5EE61      | Solar Energy and Applications               |   |
| 13.                      | A5IT32      | Cyber Forensics                             | Information Technology                  |
| 14.                      | A5IT33      | Discrete Mathematical Structures            |   |
| 15.                      | A5IT34      | Introduction to AI                          |   |
| 16.                      | A5ME75      | Basics of Robotics                          | Mechanical Engineering                  |
| 17.                      | A5ME76      | Fundamentals of Operation Research          |   |
| 18.                      | A5HS10      | Indian Ethos & Business Ethics              | Humanities and Science                  |



**OPEN ELECTIVE COURSE-IV**

| <b>S. No.</b> | <b>Course Code</b> | <b>Course Name</b>                             | <b>Offering Department</b>              |
|---------------|--------------------|--|---|
| 1.            | A5CS22             | Distributed Databases                          | Computer Science and Engineering        |
| 2.            | A5CS41             | Fundamentals of Software Testing               |   |
| 3.            | A5CS29             | Cryptography and Network Security              |   |
| 4.            | A5EC62             | Introduction to Computer Vision                | Electronics & Communication Engineering |
| 5.            | A5EC63             | Introduction to mobile communication           |   |
| 6.            | A5EC64             | Basic Embedded systems Design                  |   |
| 7.            | A5EE62             | Instrumentation and Control                    | Electrical & Electronics Engineering    |
| 8.            | A5EE63             | Energy Audit and Management Systems            |   |
| 9.            | A5EE64             | Energy Storage Systems                         |   |
| 10.           | A5IT35             | Introduction to Mobile Application Development | Information Technology                  |
| 11.           | A5IT36             | Big Data                                       |   |
| 12.           | A5IT35             | Introduction to Mobile Application Development |   |
| 13.           | A5ME77             | Introduction to Material Handling              | Mechanical Engineering                  |
| 14.           | A5ME78             | Non Conventional Energy Sources                |   |
| 15.           | A5HS11             | Management Science                             | Humanities and Science                  |
| 16.           | A5HS12             | Intellectual Property Rights                   |   |
| 17.           | A5BS15             | Number Theory                                  |   |
| 18.           | A5BS16             | Physics and Technology of Thin films           |   |
| 19.           | A5BS17             | Polymer chemistry                              |   |