



FACULTY OF  
ENGINEERING AND  
TECHNOLOGY



***B.Tech Electronics***  
***(Semiconductor and VLSI Design)***

|                 |  |
|-----------------|--|
| Division        | Faculty of Engineering and Technology                |
| School Name     | Faculty of Engineering and Technology                |
| Department Name | Department of Electrical and Electronics Engineering |
| Programme Name  | B. Tech. Electronics (Semiconductor and VLSI Design) |

| Semester    | Odd (I) | Even (II) | Total Credits |
|-------------|---------|-----------|---------------|
| First Year  | 21      | 22        | 43            |
| Second Year | 21      | 23        | 44            |
| Third Year  | 22      | 23        | 45            |
| Fourth Year | 16      | 16        | 32            |

+ + + + + + + + + + + + + + + **COURSE BASKET** + + + + + + + + + + + + + + +

| Course Type          | Description  |
|----------------------|--|
| Programme Core       | Courses dealing with foundations, depth and breadth of the major in which a student is admitted at MIT-WPU.    |
| Programme Electives  | Open electives under the programme allow students to specialise in a particular area connected to their major. |
| University Core      | Courses that reflect the core MIT-WPU values and the mission of Life Transformation of students.               |
| University Electives | Multidisciplinary courses across the faculties at MIT-WPU and outside the programme core.                      |

## Semester I

| Semester | Course Type | Course Name / Course Title                             | Total Credits |
|----------|-------------|--|---------------|
| I        | PC          | Introduction to Electronics & Semiconductor Technology | 4             |
| I        | PC          | Engineering Graphics                                   | 3             |
| I        | PC          | Digital Electronics and Logic Design                   | 4             |
| I        | PC          | Linear Algebra and Differential Calculus               | 3             |
| I        | PC          | Programming and Problem Solving                        | 3             |
| I        | UC          | Environment and Sustainability                         | 1             |
| I        | UC          | Financial Literacy                                     | 1             |
| I        | UC          | Indian Constitution                                    | 1             |
| I        | UC          | Yoga - I   | 1             |
|          |             | <b>Total Credits:</b>                                  | <b>21</b>     |

## Semester II

| Semester | Course Type | Course Name / Course Title        | Total Credits |
|----------|-------------|-----------------------------------|---------------|
| II       | PC          | Computer System Architecture      | 2             |
| II       | PC          | Electronic Devices and Circuits   | 4             |
| II       | PC          | Interdisciplinary Program Core    | 3             |
| II       | PC          | Integral Calculus                 | 3             |
| II       | PC          | Python Programming                | 1             |
| II       | UC          | Co-creation                       | 1             |
| II       | UC          | Indian Knowledge System (General) | 2             |
| II       | UC          | Sports                            | 1             |
| II       | UC          | AI for Everyone                   | 2             |
| II       | UC          | Yoga - II                         | 1             |
| II       | UC          | Foundation of Peace               | 2             |
|          |             | <b>Total Credits:</b>             | <b>22</b>     |

### Semester - III

| Semester | Course Type | Course Name / Course Title                         | Total Credits |
|----------|-------------|--|---------------|
| III      | PC          | Integrated Circuits and Applications               | 4             |
| III      | PC          | Memory Design                                      | 2             |
| III      | PC          | VLSI Design  | 3             |
| III      | PC          | Microcontroller and Applications                   | 4             |
| III      | PC          | Data Structures and Algorithms Lab                 | 1             |
| III      | PC          | VLSI Design Lab                                    | 1             |
| III      | UC          | Spiritual and Cultural heritage: Indian Experience | 2             |
| III      | UC          | Research Innovation Design Entrepreneurship RIDE   | 1             |
| III      | UE          | University Elective - I                            | 3             |
|          |             | <b>Total</b>                                       | <b>21</b>     |

### SEMESTER - IV

| Semester | Course Type | Course Name / Course Title                      | Total Credits |
|----------|-------------|---|---------------|
| IV       | PC          | VLSI Physical Design                            | 4             |
| IV       | PC          | Digital CMOS Design                             | 3             |
| IV       | PC          | Embedded System Design and RTOS & Firmware      | 3             |
| IV       | PC          | Communication Systems                           | 4             |
| IV       | PC          | Digital CMOS Design Lab                         | 1             |
| IV       | PC          | Embedded System Design with RTOS & Firmware Lab | 1             |
| IV       | PC          | Indian Knowledge System (Sci.&Tech.)            | 2             |
| IV       | UC          | Rural Immersion                                 | 1             |
| IV       | UC          | Life Realisation Program                        | 1             |
| IV       | UE          | University Elective - II                        | 3             |
|          |             | <b>Total Credits:</b>                           | <b>23</b>     |

### Semester - V

| Semester | Course Type | Course Name / Course Title                          | Total Credits |
|----------|-------------|---|---------------|
| V        | PC          | Machine Learning                                    | 3             |
| V        | PC          | VLSI STA and Power Analysis                         | 3             |
| V        | PC          | Semiconductor Technology and Manufacturing          | 4             |
| V        | PC          | Machine Learning Lab                                | 1             |
| V        | PC          | VLSI STA and Power Analysis Lab                     | 1             |
| V        | PC          | Cognitive Skills                                    | 1             |
| V        | PE          | Program Elective - I                                | 4             |
| V        | UE          | University Elective - III                           | 3             |
| V        | UC          | Managing Conflicts Peacefully: Tools and Techniques | 2             |
|          |             | <b>Total Credits:</b>                               | <b>22</b>     |

### Semester - VI

| Semester | Course Type | Course Name / Course Title          | Total Credits |
|----------|-------------|-------------------------------------|---------------|
| VI       | PC          | Analog CMOS Design                  | 3             |
| VI       | PC          | IC Package Design                   | 4             |
| VI       | PC          | VLSI Design for Test                | 3             |
| VI       | PC          | Discrete Signal Processing          | 3             |
| VI       | PC          | Minor Project                       | 1             |
| VI       | PC          | Analog CMOS Design Lab              | 1             |
| VI       | PC          | VLSI Design for Test Lab            | 1             |
| VI       | PC          | Competitive Coding                  | 1             |
| VI       | PE          | Program Elective - II               | 4             |
| VI       | UC          | National Academic Immersion Program | 2             |
|          |             | <b>Total Credits:</b>               | <b>23</b>     |

### Semester - VII

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|----------------------------|---------------|
| VII      | PE          | Program Elective - III     | 4             |
| VII      | PC          | Internship                 | 12            |
|          |             | <b>Total Credits:</b>      | <b>16</b>     |

### Semester - VIII

| Semester | Course Type | Course Name / Course Title | Total Credits |
|----------|-------------|----------------------------|---------------|
| VIII     | PC          | Capstone Project           | 12            |
| VIII     | PE          | Program Elective - IV      | 4             |
|          |             | <b>Total Credits:</b>      | <b>16</b>     |

### Program Electives

| Semester | Course Type | Course Name / Course Title   | Total Credits |
|----------|-------------|--|---------------|
| V        | PE-I        | Advanced IC Package Design (3D package, chiplets)                            | 4             |
| V        | PE-I        | Advanced Firmware  | 4             |
| V        | PE-I        | Application based Processors (-CPU, GPU, TPU)                                | 4             |
| V        | PE-I        | Object-Oriented Programming  | 4             |
| V        | PE-I        | CMOS Mixed Signal Circuit Design and Verification                            | 4             |
| VI       | PE-II       | PCB Design and Manufacturing   | 4             |
| VI       | PE-II       | Standard Communication Interfaces and Protocols (-UART, SPI, I2C, PCIE, DDR) | 4             |
| VI       | PE-II       | Edge AI  | 4             |
| VI       | PE-II       | Database Management System   | 4             |
| VI       | PE-II       | Low Power VLSI Design  | 4             |
| VII      | PE-III      | Signal Integrity (SI) and Power Integrity (PI)                               | 4             |
| VII      | PE-III      | Internet of Things and Protocols   | 4             |
| VII      | PE-III      | Application of AI/ML in EDA  | 4             |
| VII      | PE-III      | Full Stack Development   | 4             |
| VII      | PE-III      | RF IC Design   | 4             |
| VIII     | PE-III      | Power and Thermal Management in Semiconductors                               | 4             |
| VIII     | PE-IV       | Hardware/Software Co-Design  | 4             |
| VIII     | PE-IV       | Hardware Security  | 4             |
| VIII     | PE-IV       | Cloud Computing  | 4             |
| VIII     | PE-IV       | Micro Electro Mechanical Systems   | 4             |

## University Electives

| Semester | Course Type | Course Name / Course Title     | Total Credits |
|----------|-------------|--------------------------------|---------------|
| III      | UE-I        | Sensor Technology              | 3             |
| III      | UE-I        | Electronic Product Design      | 3             |
| IV       | UE-II       | Reverse Engineering            | 3             |
| IV       | UE-II       | Technological Innovations      | 3             |
| V        | UE-III      | Design Thinking and Innovation | 3             |
| V        | UE-III      | Predictive Analysis            | 3             |

\*Modifications to the programmes and courses are contingent upon adherence to university guidelines and procedures. Any proposed changes must undergo a thorough review process, including consultation with relevant academic departments, approval from the appropriate administrative bodies, and compliance with accreditation standards. Additionally, consideration will be given to feedback from students, faculty, and other stakeholders to ensure that modifications align with the overall educational objectives and mission of the university. The implementation of any approved changes will be communicated transparently to the university community, and appropriate measures will be taken to facilitate a smooth transition for all affected parties.