# ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH

Techno Campus, Mahalaxmi Vihar, Ghatikia, Bhubaneswar-751029.

**Syllabus Structure (Effective from 2023-24)**

**School/ Department: School of Electrical Sciences**
**Course: M. Tech., Programme: Power Electronics & Drives (PED),**
**Duration: 2 years (Four Semesters)**

**Abbreviation used:**

| | | | | | |
|---|---|---|---|---|---|
| AC | Audit course | LC | Lab Course | PA | Practical Assessment |
| PC | Professional Core | PR | Project/ Practical/ Internship | L | Lecture |
| PE | Professional Elective | SE | Seminar/ Expert Lecture/ Etc. | T | Tutorial |
| OE | Open Elective | IA* | Internal Assessment | P | Practical |
| MC | Mandatory/ Common Course | EA | End-Semester Assessment | | |
| *Internal Assessment Mark (30 marks) consists of (i) Mid Semester (20 marks), (ii) Quiz/ Assignment (10 marks) | | | | | |

**Subject Code Format:**

| A1 | A2 | B3 | C4 | C5 | C6 |
|---|---|---|---|---|---|
| **School/ Dept. (Offering)** | | **Level** | **0:** AC | **Serial Number (01 to 99)** | |
| **BH:** Basic Sciences and Humanities | | **1:** UG/ Int. Msc. (1st Year) | **1:** PC | 01/ 03/…/ 19: Odd Sem. (ESM) | |
| **CS:** Computer Sciences | | **2:** UG/ Int. Msc. (2nd Year) | **2:** PE | 21/ 23/…/ 39: Odd Sem. (PED) | |
| **EE:** Electrical Sciences | | **3:** UG/ Int. Msc. (3rd Year) | **3:** OE | 41/ 43/…/ 59: Odd Sem. (PSE) | |
| **EI:** Electronic Sciences | | **4:** UG/ Int. Msc. (4th Year) | **4:** MC | 61/ 63/…/ 79: Odd Sem. (Prog-4) | |
| **IP:** Infrastructure and Planning | | **5:** UG/ Int. Msc. (5th Year) | **5:** LC | 81/ 83/…/ 99: Odd Sem. (Prog-5) | |
| **MS:** Mechanical Sciences | | **6:** PG (1st Year) | **6:** PR | | |
| **BT:** Biotechnology | | **7:** PG (2nd Year) | **7:** SE | 02/ 04/…/ 20: Even Sem. (ESM) | |
| **TE:** Textile Engineering | | **8:** Ph.D. | **8:** | 22/ 24/…/ 40: Even Sem. (PED) | |
| | | | **9:** | 42/ 44/…/ 60: Even Sem. (PSE) | |
| | | | | 62/ 64/…/ 80: Even Sem. (Prog-4) | |
| | | | | 82/ 84/…/ 98: Even Sem. (Prog-5) | |

## 1st Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 1 | EE6121 | Advanced Power Electronics Converter | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | PC 2 | EE6123 | Electric Drives | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 3 | PE 1 (Any One) | EE6221 | Storage Technology | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | EE6223 | Advanced Control System | | | | | | | | |
| | | EE6225 | Power Quality | | | | | | | | |
| 4 | MC 1 | BS6401 | Mathematical Methods in Engineering | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 5 | MC 2 | MS6403 | Research Methodology and IPR | 2 | 0 | 0 | 2 | 30 | 70 | - | 100 |
| 6 | LC 1 | EE6521 | Advanced Power Electronics Lab | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 7 | LC 2 | EE6523 | Power Electronics Simulation Lab | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 8 | AC 1 | BH6001 | English for Research Paper Writing | 2 | 0 | 0 | 0 | 30 | 70 | - | 100 |
| | | | **Total** | 16 | 0 | 10 | 18 | 180 | 420 | 200 | 800 |

## 2nd Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PC 3 | EE6122 | Switch Mode Power Conversion | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 2 | PC 4 | EE6124 | Modeling, Analysis and Control of Electric Drives | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 3 | PE 2 (Any One) | EE6222 | AI and Machine Learning | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | EE6224 | Wind and Solar Energy System | | | | | | | | |
| 4 | PE 3 (Any One) | EE6226 | Advanced DSP | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | EE6228 | Smart Grid Technology | | | | | | | | |
| | | EE6230 | FACTS and Custom Power Devices | | | | | | | | |
| 5 | OE 1 | | Any One from the List of *OE 1 (Appendix-I) | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| 6 | PR 1 | EE6622 | Project (Specialization Related) | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 7 | LC 3 | EE6522 | Advanced Electric Drives Lab | 0 | 0 | 4 | 2 | - | - | 100 | 100 |
| 8 | AC 2 | IP6002 | Disaster Management | 2 | 0 | 0 | 0 | 30 | 70 | - | 100 |
| | | | **Total** | **17** | **0** | **8** | **19** | **180** | **420** | **200** | **800** |

## 3rd Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PE 4* (Any One) | EE7221 | Grid Integration of Renewable Sources | 3 | 0 | 0 | 3 | 30 | 70 | - | 100 |
| | | EE7223 | Industrial Automation and Control | | | | | | | | |
| | | EE7225 | Electric and Hybrid Vehicles | | | | | | | | |
| | | EE7227 | Modeling and Simulation | | | | | | | | |
| | | EE7229 | Intelligent Motor Controller | | | | | | | | |
| 2 | PR 2 | EE7621 | Dissertation (Phase-I) | 0 | 0 | 24 | 12 | - | - | 100 | 100 |
| | | | **Total** | **3** | **0** | **24** | **15** | **30** | **70** | **100** | **200** |

* Virtual/Online Course either offered by OUTR or available in MOOCs platform (No physical class)

## 4th Semester

| Sl. No. | Subject Type | Subject Code | Subject Name | Teaching Hours | | | Credit | Maximum Marks | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | EA | PA | Total |
| 1 | PR 3 | EE7622 | Dissertation (Phase-II) | 0 | 0 | 32 | 16 | - | - | 100 | 100 |
| | | | **Total** | **0** | **0** | **32** | **16** | **-** | **-** | **100** | **100** |

## Credits and Maximum Marks

| Sl. No. | Semester | Credits | Maximum Marks |
|---|---|---|---|
| 1 | 1st | 18 | 800 |
| 2 | 2nd | 19 | 800 |
| 3 | 3rd | 15 | 200 |
| 4 | 4th | 16 | 100 |
| | Total | 68 | 1900 |

# ODISHA UNIVERSITY OF TECHNOLOGY AND RESEARCH

Techno Campus, Mahalaxmi Vihar, Ghatikia, Bhubaneswar-751029.
## Syllabus Structure (Effective from 2023-24)

## LIST OF (MC/ *OE/ AC) SUBJECTS OFFERED BY SCHOOLS/ DEPARTMENTS

| School/ Department (Offering) | Subject Type | Subject Code | Subject Name |
|---|---|---|---|
| Basic Science and Humanities | MC 1 | BS6401 | Mathematical Methods in Engineering |
| | *OE 1 | BH6302 | Spectroscopic Techniques for Organic Compounds |
| | | BH6304 | Chemical Biology |
| | | BH6306 | Nanoscience and Technology |
| | | BH6308 | Statistical Methods |
| | | BH6310 | Operations Research |
| | | BH6312 | Advanced Numerical Methods |
| | AC 1 | BH6001 | English for Research Paper Writing |
| | | BH6003 | Sanskrit for Technical Knowledge |
| | | BH6005 | Value Education |
| | | BH6007 | Constitution of India |
| | AC 2 | BH6002 | Pedagogy Studies |
| | | BH6004 | Stress Management by Yoga |
| | | BH6006 | Personality Development through Life Enlightenment Skills |
| Computer Sciences | *OE 1 | CS6302 | Pattern Recognition |
| | | CS6304 | Distributed Systems |
| | | CS6306 | Microfluidic Biochip |
| | | CS6308 | Programming in C |
| | | CS6310 | Data Structure |
| | | CS6312 | Computer Vision |
| Electrical Sciences | *OE 1 | EE6302 | Quantitative Methods for Energy Management and Planning |
| | | EE6304 | Soft Computing application to Engineering |
| | | EE6306 | Illumination Engineering |
| | | EE6308 | AI and ML for Biomedical Sciences |
| Electronic Sciences | *OE 1 | EI6302 | Machine Learning and Artificial Intelligence |
| | | EI6304 | IoT and its Applications |
| | | EI6306 | Parallel Processing |
| | | EI6308 | Signal Processing in Mechatronics Systems |
| | | EI6310 | Micro Electro Mechanical Systems |
| Infrastructure and Planning | *OE 1 | IP6302 | Universally Accessible Built Environments |
| | | IP6304 | Environment Impact Analysis |
| | | IP6306 | Geotechnics for Waste Materials |
| | | IP6308 | Project Planning and Management |
| | AC 2 | IP6002 | Disaster Management |
| Mechanical Sciences | MC 2 | MS6403 | Research Methodology and IPR |
| | *OE 1 | MS6302 | Production Planning and Control |
| | | MS6304 | Design of Experiment |
| | | MS6306 | Total Quality Management and Six Sigma |
| | | MS6308 | Financial Institutions, Instruments and Markets |
| | | MS6310 | Renewable Energy Systems |
| | | MS6312 | Design of Thermal Systems |
| | | MS6314 | Sensors and Actuators in Industry |
| | | MS6316 | Robot Mechanics and Control |
| Biotechnology | *OE 1 | BT6302 | Nanobiotechnology |
| Textile Engineering | *OE 1 | TE6302 | Polymer Composite |

## *N.B.:

The Open Elective Subjects (*OE 1) are specifically open for all programs of Schools/ Departments, other than the School/ Department offering the same subject.