

## Department of Electrical and Electronics Engineering

### Lesson Plan & Work-done Diary for AY:2025-26, ODD Semester

| Course with Code: Power Electronics_BEE503 |                       |  |              | Faculty: Dr Sathish K R |                            |                | Semester & Section: 5th Sem |                          |
|--|-----------------------|--|--------------|-------------------------|----------------------------|----------------|-----------------------------|--------------------------|
| Class No.                                  | Date planned (DD/M M) | Topics to be covered   | TLP Planned  | Class No.               | Date of Conduction (DD/MM) | Topics Covered | TLP Executed                | Remarks if any deviation |
| <b>MODULE-1</b>                            |                       |  |              |                         |                            |                |                             |                          |
| 1  |                       | <b>Introduction:</b> Applications of Power Electronics,                              | Chalk & Talk | 1                       |                            |                |                             |                          |
| 2  |                       | Types of Power Electronic Circuits,  | Chalk & Talk | 2                       |                            |                |                             |                          |
| 3  |                       | Peripheral Effects, Characteristics and Specifications of Switches.                  | Chalk & Talk | 3                       |                            |                |                             |                          |
| 4  |                       | Characteristics of diodes and applications of diodes.                                | Chalk & Talk | 4                       |                            |                |                             |                          |
| 5  |                       | Types of diodes and reverse recovery characteristics.                                | Chalk & Talk | 5                       |                            |                |                             |                          |
| 6  |                       | Diode switched R load and RL load.   | Chalk & Talk | 6                       |                            |                |                             |                          |
| 7  |                       | Freewheeling Diodes with Switched RL Load.   | Chalk & Talk | 7                       |                            |                |                             |                          |
| 8  |                       | <b>Diode Rectifiers:</b> Introduction, Single-Phase Full-Wave Rectifiers with R Load | Chalk & Talk | 8                       |                            |                |                             |                          |
| 9  |                       | Single-Phase Full-Wave Rectifier with a RL load and highly Inductive Load            | Chalk & Talk | 9                       |                            |                |                             |                          |
| 10   |                       | Solving Numerical and evaluation of Module using SRS/Mock Test.                      | Chalk & Talk | 10                      |                            |                |                             |                          |

## Department of Electrical and Electronics Engineering

| Course with Code: Power Electronics_BEE503 |                      |   |              | Faculty: Dr Sathish K R |                            |                | Semester & Section: 5th Sem |                          |
|--|----------------------|---|--------------|-------------------------|----------------------------|----------------|-----------------------------|--------------------------|
| Class No.                                  | Date planned (DD/MM) | Topics to be covered  | TLP Planned  | Class No.               | Date of Conduction (DD/MM) | Topics Covered | TLP Executed                | Remarks if any deviation |
| <b>MODULE-2</b>                            |                      |   |              |                         |                            |                |                             |                          |
| 11   |                      | <b>Power Transistors:</b> Introduction, Power Transistor – Steady State Characteristics | Chalk & Talk | 11                      |                            |                |                             |                          |
| 12   |                      | Switching Characteristics of BJT  | ICT          | 12                      |                            |                |                             |                          |
| 13   |                      | Steady State Characteristics of MOSFET  | ICT          | 13                      |                            |                |                             |                          |
| 14   |                      | Switching Characteristics of MOSFET, Switching Limits,                                  | ICT          | 14                      |                            |                |                             |                          |
| 15   |                      | Solving numerical on characteristics of BJT & MOSFET                                    | Chalk & Talk | 15                      |                            |                |                             |                          |
| 16   |                      | IGBTs, MOSFET Gate Drive circuits   | Chalk & Talk | 16                      |                            |                |                             |                          |
| 17   |                      | BJT Base Drive circuits   | Chalk & Talk | 17                      |                            |                |                             |                          |
| 18   |                      | Isolation of Gate and Base Drives   | ICT          | 18                      |                            |                |                             |                          |
| 19   |                      | Pulse transformers and Optocouplers   | Chalk & Talk | 19                      |                            |                |                             |                          |
| 20   |                      | Solving numerical on-base drive requirements Evaluation of Module using SRS/Mock Test   | Chalk & Talk | 20                      |                            |                |                             |                          |

## Department of Electrical and Electronics Engineering

| Course with Code: Power Electronics_BEE503 |                      |  |              | Faculty: Dr Sathish K R |                            |                | Semester & Section: 5th Sem |                          |
|--|----------------------|--|--------------|-------------------------|----------------------------|----------------|-----------------------------|--------------------------|
| Class No.                                  | Date planned (DD/MM) | Topics to be covered   | TLP Planned  | Class No.               | Date of Conduction (DD/MM) | Topics Covered | TLP Executed                | Remarks if any deviation |
| <b>MODULE-3</b>                            |                      |  |              |                         |                            |                |                             |                          |
| 21   |                      | <b>Thyristors:</b> Introduction and Types  | Chalk & Talk | 21                      |                            |                |                             |                          |
| 22   |                      | Characteristics: Thyristor Turn- On characteristics.   | ICT          | 22                      |                            |                |                             |                          |
| 23   |                      | Thyristor Turn-Off characteristics, Two-Transistor Model of Thyristor,                         | Chalk & Talk | 23                      |                            |                |                             |                          |
| 24   |                      | Solving numerical on Two – Transistor model  | Chalk & Talk | 24                      |                            |                |                             |                          |
| 25   |                      | Series and Parallel Operation of Thyristors,   | Chalk & Talk | 25                      |                            |                |                             |                          |
| 26   |                      | $di/dt$ Protection, $dv/dt$ Protection,  | ICT          | 26                      |                            |                |                             |                          |
| 27   |                      | Solving numerical on parallel operation on thyristors.   | Chalk & Talk | 27                      |                            |                |                             |                          |
| 28   |                      | DIACs, Thyristor Firing Circuits,  | ICT          | 28                      |                            |                |                             |                          |
| 29   |                      | Unijunction Transistor.  | Chalk & Talk | 29                      |                            |                |                             |                          |
| 30   |                      | Solving numerical on-firing circuits of thyristor and evaluation of Module using SRS/Mock Test | Chalk & Talk | 30                      |                            |                |                             |                          |

## Department of Electrical and Electronics Engineering

| Course with Code: Power Electronics_BEE503 |                      |  |              | Faculty: Dr Sathish K R |                            |                | Semester & Section: 5th Sem |                          |
|--|----------------------|--|--------------|-------------------------|----------------------------|----------------|-----------------------------|--------------------------|
| Class No.                                  | Date planned (DD/MM) | Topics to be covered   | TLP Planned  | Class No.               | Date of Conduction (DD/MM) | Topics Covered | TLP Executed                | Remarks if any deviation |
| <b>MODULE-4</b>                            |                      |  |              |                         |                            |                |                             |                          |
| 31   |                      | <b>Controlled Rectifiers:</b><br>Introduction, Single-Phase Full Converters,                             | Chalk & Talk | 31                      |                            |                |                             |                          |
| 32   |                      | Single-Phase Dual Converters,  | ICT          | 32                      |                            |                |                             |                          |
| 33   |                      | Three- Phase Full Converters,  | Chalk & Talk | 33                      |                            |                |                             |                          |
| 34   |                      | Three-Phase Dual Converters,   | ICT          | 34                      |                            |                |                             |                          |
| 35   |                      | Solving numerical on Controlled rectifiers   | Chalk & Talk | 35                      |                            |                |                             |                          |
| 36   |                      | <b>AC Voltage Controllers:</b><br>Introduction, Single-Phase Full-Wave Controllers with Resistive Loads, | ICT          | 36                      |                            |                |                             |                          |
| 37   |                      | Single- Phase Full-Wave Controllers with Inductive Loads   | ICT          | 37                      |                            |                |                             |                          |
| 38   |                      | Three-Phase Full-Wave Controllers  | Chalk & Talk | 38                      |                            |                |                             |                          |
| 39   |                      | Solving numerical on AC voltagecontrollers   | Chalk & Talk | 39                      |                            |                |                             |                          |
| 40   |                      | Solving numerical on AC voltage controllers and evaluation of Module.                                    | Chalk & Talk | 40                      |                            |                |                             |                          |

## Department of Electrical and Electronics Engineering

| Course with Code: Power Electronics_BEE503 |                      |   |              | Faculty: Dr Sathish K R |                            |                | Semester & Section: 5th Sem |                          |
|--|----------------------|---|--------------|-------------------------|----------------------------|----------------|-----------------------------|--------------------------|
| Class No.                                  | Date planned (DD/MM) | Topics to be covered  | TLP Planned  | Class No.               | Date of Conduction (DD/MM) | Topics Covered | TLP Executed                | Remarks if any deviation |
| <b>MODULE-5</b>                            |                      |   |              |                         |                            |                |                             |                          |
| 41   |                      | <b>DC-DC Converters:</b> Introduction, principle of step down with RL load.                 | Chalk & Talk | 41                      |                            |                |                             |                          |
| 42   |                      | Principle of step-up chopper with RL load   | Chalk & Talk | 42                      |                            |                |                             |                          |
| 43   |                      | Performance parameters of Step-up and step-down chopper                                     | Chalk & Talk | 43                      |                            |                |                             |                          |
| 44   |                      | DC-DC converter classification  | ICT          | 44                      |                            |                |                             |                          |
| 45   |                      | Solving numerical on DC-DC converters   | Chalk & Talk | 45                      |                            |                |                             |                          |
| 46   |                      | <b>DC-AC converters:</b> Introduction, principle of operation single-phase bridge inverters | Chalk & Talk | 46                      |                            |                |                             |                          |
| 47   |                      | Principle and operation of three-phase bridge inverters                                     | ICT          | 47                      |                            |                |                             |                          |
| 48   |                      | Voltage control of single-phase inverter  | ICT          | 48                      |                            |                |                             |                          |
| 49   |                      | Harmonic reductions and current source inverter   | Chalk & Talk | 49                      |                            |                |                             |                          |
| 50   |                      | Solving numerical & Evaluation of Module using SRS/Mock Test                                | Chalk & Talk | 50                      |                            |                |                             |                          |

## Department of Electrical and Electronics Engineering

|                           | Activity   | Planned | Actual                    | Remarks |
|---------------------------|--|---------|---------------------------|---------|
| 1                         | Theory Classes                                   | 50      |                           |         |
| 2                         | Assignments/ Quizzes/<br>Self-study              | 5       |                           |         |
| 3                         | Tutorials/ Extra classes                         | -       |                           |         |
| 4                         | Internal Assessments                             | 3       |                           |         |
| 5                         | ICT based Teaching<br>(% of usage in Curriculum) | 30      |                           |         |
| <b>Planning</b>           |  |         | <b>Execution</b>          |         |
| <b>Faculty Signature:</b> |  |         | <b>Faculty Signature:</b> |         |
| <b>HoD Signature:</b>     |  |         | <b>HoD Signature:</b>     |         |