

| <u>LESSON PLAN</u>                               |            |                                                             |                                                                                                                          |                                        |
|--------------------------------------------------|------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| ACADEMIC LESSON PLAN FOR WINTER 2026             |            |                                                             |                                                                                                                          |                                        |
| DISCIPLINE                                       |            | SEMESTER                                                    | NAME OF THE TEACHING FACULTY                                                                                             |                                        |
| ETC ENGG.                                        |            | 3RD                                                         | MRS MANORAMA PADHY,LECT(E&TC)                                                                                            |                                        |
| <u>SUBJECT:</u><br>ELECTRONICS DEVICES<br>(TH-2) |            | NO. OF DAYS PER WEEK CLASS ALLOTTED : 03                    |                                                                                                                          | SEMESTER FROM 01/07/2026 TO 05/11/2026 |
|                                                  |            | NO. OF WEEKS : 15 NOS.                                      |                                                                                                                          |                                        |
| WEEKS                                            | CLASS DAYS | UNITS                                                       | THEORY TOPICS                                                                                                            |                                        |
| 1ST WEEK                                         | 1ST        | <u>UNIT-1:</u><br>Introduction to<br>Semiconductor Physics  | Review of Quantum Mechanics, Electrons in periodic Lattices                                                              |                                        |
|                                                  | 2ND        |                                                             | Energy bands in intrinsic and extrinsic silicon                                                                          |                                        |
|                                                  | 3RD        |                                                             | Carrier transport: Diffusion current, Drift current, Mobility and resistivity                                            |                                        |
| 2ND WEEK                                         | 1ST        | <u>UNIT-2:</u><br>P-N Junction Diodes                       | Generation and recombination of carriers                                                                                 |                                        |
|                                                  | 2ND        |                                                             | Poisson and continuity equation                                                                                          |                                        |
|                                                  | 3RD        |                                                             | Formation of P-N Junction Diodes                                                                                         |                                        |
| 3RD WEEK                                         | 1ST        |                                                             | Construction & Operating Principle of P-N Junction Diode                                                                 |                                        |
|                                                  | 2ND        |                                                             | P-N junction I-V characteristics                                                                                         |                                        |
|                                                  | 3RD        |                                                             | Small signal switching models                                                                                            |                                        |
| 4TH WEEK                                         | 1ST        |                                                             | Define breakdown and explain Zener & Avalanche breakdown                                                                 |                                        |
|                                                  | 2ND        |                                                             | Construction & Operating Principle of Zener diode                                                                        |                                        |
|                                                  | 3RD        |                                                             | Construction & Operating Principle of Schottky diode & LED                                                               |                                        |
| 5TH WEEK                                         | 1ST        |                                                             | Construction & Operating Principle of Photodiode and solar cell                                                          |                                        |
|                                                  | 2ND        |                                                             | Construction of BJT, Operating Principle of BJT & Types of BJT                                                           |                                        |
|                                                  | 3RD        |                                                             | Working principle of p-n-p and n-p-n BJT                                                                                 |                                        |
| 6TH WEEK                                         | 1ST        |                                                             | I-V characteristics of BJT & Ebers Moll Model                                                                            |                                        |
|                                                  | 2ND        |                                                             | Different types of transistor connection: CommonBase (CB), Common Emitter (CE), Common Collector (CC)                    |                                        |
|                                                  | 3RD        |                                                             | Input and output characteristics of transistor in different connections                                                  |                                        |
| 7TH WEEK                                         | 1ST        |                                                             | Define ALPHA, BETA and GAMMA of transistors in various modes.                                                            |                                        |
|                                                  | 2ND        |                                                             | Establish the Mathematical relationship between ALPHA, BETA and GAMMA                                                    |                                        |
|                                                  | 3RD        |                                                             | Basic concept of Biasing & Types of Biasing                                                                              |                                        |
| 8TH WEEK                                         | 1ST        |                                                             | h-parameter model of BJT                                                                                                 |                                        |
|                                                  | 2ND        |                                                             | Load line and determine the Q-point.                                                                                     |                                        |
|                                                  | 3RD        |                                                             | Types of Coupling & Working principle and use of R-C Coupled Amplifier                                                   |                                        |
| 9TH WEEK                                         | 1ST        |                                                             | Frequency Responses of R-C coupled Amplifier                                                                             |                                        |
|                                                  | 2ND        | <u>UNIT-4:</u><br>FIELD EFFECT<br>TRANSISTOR (FET)          | FET & its classifications                                                                                                |                                        |
|                                                  | 3RD        |                                                             | Differentiate between JFET & BJT                                                                                         |                                        |
| 10TH<br>WEEK                                     | 1ST        |                                                             | Construction, working principle & characteristics of JEFT                                                                |                                        |
|                                                  | 2ND        |                                                             | Parameters of JFET & establish relation among JFET parameters & JEFT as an amplifier                                     |                                        |
|                                                  | 3RD        |                                                             | Construction and working principle of MOSEFT                                                                             |                                        |
| 11TH<br>WEEK                                     | 1ST        |                                                             | Classification of MOSEFT                                                                                                 |                                        |
|                                                  | 2ND        |                                                             | Characteristics (Drain & Transfer) of MOSEFT                                                                             |                                        |
|                                                  | 3RD        |                                                             | Explain the operation of CMOS, VMOS & LDMOS                                                                              |                                        |
| 12TH<br>WEEK                                     | 1ST        | <u>UNIT-5:</u><br>FEED BACK<br>AMPLIFIER &<br>OSCILLATOR    | Define & classify Feedback Amplifier                                                                                     |                                        |
|                                                  | 2ND        |                                                             | Types of feedback – negative & positive feedback                                                                         |                                        |
|                                                  | 3RD        |                                                             | Characteristics voltage gain, bandwidth, input Impedance output impedance, stability, noise and distortion in amplifiers |                                        |
| 13TH<br>WEEK                                     | 1ST        |                                                             | Oscillator: Block diagram of sine wave oscillator                                                                        |                                        |
|                                                  | 2ND        |                                                             | Types Requirement of oscillation                                                                                         |                                        |
|                                                  | 3RD        |                                                             | Barkhausen criterion & LC oscillators                                                                                    |                                        |
| 14TH<br>WEEK                                     | 1ST        |                                                             | Colpitts Oscillators: CIRCUIT OPERATION, CIRCUIT DIAGRAM, EQUATION FOR FREQUENCY OF OSCILLATION & RESONANCE FREQUENCY    |                                        |
|                                                  | 2ND        |                                                             | Hartley Oscillators: CIRCUIT OPERATION, CIRCUIT DIAGRAM, EQUATION FOR FREQUENCY OF OSCILLATION & RESONANCE FREQUENCY     |                                        |
|                                                  | 3RD        |                                                             | Wien Bridge Oscillators: CIRCUIT OPERATION, CIRCUIT DIAGRAM, EQUATION FOR FREQUENCY OF OSCILLATION & RESONANCE FREQUENCY |                                        |
| 15TH<br>WEEK                                     | 1ST        | <u>UNIT-6:</u><br>Integrated Circuit<br>Fabrication Process | Explain different fabrication process of Integrated circuit: Oxidation, Diffusion, Ion implantation                      |                                        |
|                                                  | 2ND        |                                                             | Explain Photo-lithography, Etching, Chemical vapor deposition                                                            |                                        |
|                                                  | 3RD        |                                                             | Explain Sputtering, Twin-tub CMOS process                                                                                |                                        |

  
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| ACADEMIC LESSON PLAN FOR WINTER 2026   |  |          |                                        |  |
| DISCIPLINE                             |  | SEMESTER | NAME OF THE TEACHING FACULTY           |  |
| ETC ENGG.                              |  | 3RD      | MRS MANORAMA PADHY,LECT(E&TC)          |  |
| <u>SUBJECT:</u><br>ELECTRONICS DEVICES |  |          | SEMESTER FROM 01/07/2026 TO 05/11/2026 |  |

| ELECTRONICS DEVICES<br>LABORATORY<br>(PR-2) |               | NO. OF DAYS PER WEEK CLASS ALLOTTED : 02                                                                                 | SEMESTER FROM 01/07/2026 TO 05/11/2026 |
|---------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                                             |               | NO. OF WEEKS : 15 NOS.                                                                                                   |                                        |
| WEEKS                                       | CLASS<br>DAYS | THEORY TOPICS                                                                                                            |                                        |
| 1ST<br>WEEK                                 | 1ST           | Characteristics of P-N junction diode                                                                                    |                                        |
|                                             | 2ND           | Characteristics of P-N junction diode, with the lab record and rubrics                                                   |                                        |
| 2ND<br>WEEK                                 | 1ST           | Characteristics of Zener diode                                                                                           |                                        |
|                                             | 4TH           | Characteristics of Zener diode, with the lab record and rubrics                                                          |                                        |
| 3RD<br>WEEK                                 | 1ST           | Input-Output and Transfer characteristics of CE and CC Amplifier                                                         |                                        |
|                                             | 4TH           | Input-Output and Transfer characteristics of CE and CC Amplifier, with the lab record and rubrics                        |                                        |
| 4TH<br>WEEK                                 | 1ST           | Characteristics of Photo-diode and Photo transistor                                                                      |                                        |
|                                             | 4TH           | Characteristics of Photo-diode and Photo transistor, with the lab record and rubrics                                     |                                        |
| 5TH<br>WEEK                                 | 1ST           | Transfer characteristics of JFET                                                                                         |                                        |
|                                             | 4TH           | Transfer characteristics of JFET, with the lab record and rubrics                                                        |                                        |
| 6TH<br>WEEK                                 | 1ST           | Transfer characteristics of MOSFET (with depletion and enhancement mode)                                                 |                                        |
|                                             | 4TH           | Transfer characteristics of MOSFET (with depletion and enhancement mode), with the lab record and rubrics                |                                        |
| 7TH<br>WEEK                                 | 1ST           | Characteristics of LED with three different wavelengths                                                                  |                                        |
|                                             | 4TH           | Characteristics of LED with three different wavelengths, with the lab record and rubrics                                 |                                        |
| 8TH<br>WEEK                                 | 1ST           | Construct Half wave rectifier and analyse the waveform                                                                   |                                        |
|                                             | 4TH           | Construct Half wave rectifier and analyse the waveform, with the lab record and rubrics                                  |                                        |
| 9TH<br>WEEK                                 | 1ST           | Construct Full wave rectifier with 2 diodes and analyse the waveform.                                                    |                                        |
|                                             | 4TH           | Construct Full wave rectifier with 2 diodes and analyse the waveform, with the lab record and rubrics                    |                                        |
| 10TH<br>WEEK                                | 1ST           | Construct Full wave rectifier with 4 diodes (Bridge rectifier) and analyse the waveform                                  |                                        |
|                                             | 4TH           | Construct Full wave rectifier with 4 diodes (Bridge rectifier) and analyse the waveform, with the lab record and rubrics |                                        |
| 11TH<br>WEEK                                | 1ST           | Construct & Find the gain of                                                                                             |                                        |
|                                             | 4TH           | Construct & Find the gain of                                                                                             |                                        |
| 12TH<br>WEEK                                | 1ST           | Construct & test Class B-Push Pull amplifier & observe the wave form                                                     |                                        |
|                                             | 4TH           | Construct & test Class B-Push Pull amplifier & observe the wave form, with the lab record and rubrics                    |                                        |
| 13TH<br>WEEK                                | 1ST           | Construct & calculate the frequency & Draw the wave form of                                                              |                                        |
|                                             | 4TH           | Construct & calculate the frequency & Draw the wave form of                                                              |                                        |
| 14TH<br>WEEK                                | 1ST           | Simulation experiments using PSPICE or Multisim.                                                                         |                                        |
|                                             | 4TH           | Simulation experiments using PSPICE or Multisim, with the lab record and rubrics                                         |                                        |
| 15TH<br>WEEK                                | 1ST           | Practice the above experiments and submit the complete lab record and do viva voce.                                      |                                        |
|                                             | 4TH           | Practice the above experiments and submit the complete lab record and do viva voce.                                      |                                        |

  
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| <u>LESSON PLAN</u>                            |            |                                                     |                                                             |                                                            |  |
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| ACADEMIC LESSON PLAN FOR WINTER 2026          |            |                                                     |                                                             |                                                            |  |
| DISCIPLINE                                    |            | SEMESTER                                            |                                                             | NAME OF THE TEACHING FACULTY                               |  |
| ETC ENGG.                                     |            | 5TH                                                 |                                                             | MRS MANORAMA PADHY,LECT(E&TC)                              |  |
| <b>SUBJECT:</b><br>OPTOELECTRONICS<br>(TH-4A) |            | SEMESTER FROM 01/07/2026 TO 05/11/2026              |                                                             |                                                            |  |
|                                               |            | NO. OF DAYS PER WEEK CLASS ALLOTED : 03             |                                                             |                                                            |  |
|                                               |            | NO. OF WEEKS : 15 NOS.                              |                                                             |                                                            |  |
| WEEKS                                         | CLASS DAYS | UNITS                                               | THEORY TOPICS                                               |                                                            |  |
| 1ST WEEK                                      | 1ST        | <b>UNIT-I:</b><br>Semiconductors                    | Introduction to semiconductors                              |                                                            |  |
|                                               | 2ND        |                                                     | Concept of Doping                                           |                                                            |  |
|                                               | 3RD        |                                                     | Alloy Semiconductors                                        |                                                            |  |
| 2ND WEEK                                      | 1ST        |                                                     | Electron-hole pair formation and recombination              |                                                            |  |
|                                               | 2ND        |                                                     | Energy bands in solids                                      |                                                            |  |
|                                               | 3RD        |                                                     | <b>UNIT-II:</b><br>Optical Processes in<br>Semiconductors   | Absorption in semiconductors                               |  |
| 3RD WEEK                                      | 1ST        | Indirect intrinsic transitions & Exciton absorption |                                                             |                                                            |  |
|                                               | 2ND        | Donor acceptor and impurity band absorption         |                                                             |                                                            |  |
|                                               | 3RD        | Effect of electric field on absorption              |                                                             |                                                            |  |
| 4TH WEEK                                      | 1ST        | Radiation in Semiconductors                         |                                                             |                                                            |  |
|                                               | 2ND        | Relation between absorption and emission spectra    |                                                             |                                                            |  |
|                                               | 3RD        | Near band gap radioactive transitions               |                                                             |                                                            |  |
| 5TH WEEK                                      | 1ST        | <b>UNIT-III:</b><br>Optoelectronic detectors        |                                                             | Construction and working principle of Photoconductors      |  |
|                                               | 2ND        |                                                     |                                                             | Construction and working principle of Junction Photodiodes |  |
|                                               | 3RD        |                                                     | Construction and working principle of PIN Photodiodes       |                                                            |  |
| 6TH WEEK                                      | 1ST        |                                                     | Construction and working principle of Heterojunction diodes |                                                            |  |
|                                               | 2ND        |                                                     | Construction and working principle of Avalanche Photodiodes |                                                            |  |
|                                               | 3RD        |                                                     | Construction and working principle of Phototransistors      |                                                            |  |

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| 7TH WEEK  | 1ST |                                  | Construction and working principle of Modulated barrier Photodiode              |
|           | 2ND |                                  | Construction and working principle of Metal - semiconductor -metal photodiode   |
|           | 3RD |                                  | Explain Solar energy spectrum                                                   |
| 8TH WEEK  | 1ST | UNIT-IV:<br>Photovoltaic devices | Device principles concept                                                       |
|           | 2ND |                                  | I-V characteristics of Photovoltaic device                                      |
|           | 3RD |                                  | Equivalent circuit of Photovoltaic device                                       |
| 9TH WEEK  | 1ST |                                  | Materials, devices and efficiencies                                             |
|           | 2ND |                                  | Electroluminescent process                                                      |
|           | 3RD |                                  | Choice of LED materials                                                         |
| 10TH WEEK | 1ST | UNIT-V:<br>Light emitting diode  | Device configuration and efficiency                                             |
|           | 2ND |                                  | Light output from LED, LED structure                                            |
|           | 3RD |                                  | Heterojunction LED                                                              |
| 11TH WEEK | 1ST |                                  | Surface emitting LED                                                            |
|           | 2ND |                                  | Device performance characteristics, Frequency response and modulation bandwidth |
|           | 3RD |                                  | Junction laser operating principles                                             |
| 12TH WEEK | 1ST | UNIT-VI:<br>Laser diode          | Threshold current                                                               |
|           | 2ND |                                  | Heterojunction lasers                                                           |
|           | 3RD |                                  | Distributed feedback lasers                                                     |
| 13TH WEEK | 1ST |                                  | Cleaved coupled cavity laser                                                    |
|           | 2ND |                                  | Quantum well lasers                                                             |
|           | 3RD |                                  | Modulation of lasers - rate equations                                           |
| 14TH WEEK | 1ST |                                  | Steady state solution & Transient phenomena and frequency response              |
|           | 2ND |                                  | Introduction to optical fiber                                                   |
|           | 3RD |                                  | Structure of optical fiber                                                      |
| 15TH WEEK | 1ST | UNIT-VII:<br>Optical fiber       | Propagation of light through a numerical aperture                               |
|           | 2ND |                                  | Pulse broadening                                                                |
|           | 3RD |                                  | Advantages and disadvantages of fiber optics                                    |

  
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| LESSON PLAN                                       |                                          |                                                                                                                          |
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| ACADEMIC LESSON PLAN FOR WINTER 2026              |                                          |                                                                                                                          |
| DISCIPLINE                                        | SEMESTER                                 | NAME OF THE TEACHING FACULTY                                                                                             |
| ETC ENGG.                                         | 5TH                                      | MRS MANORAMA PADHY, LECT(E&TC)                                                                                           |
| SUBJECT:<br>FIBER OPTIC COMMUNICATIONS LABORATORY | NO. OF DAYS PER WEEK CLASS ALLOTTED : 02 | SEMESTER FROM 01/07/2026 TO 05/11/2026                                                                                   |
|                                                   |                                          | NO. OF WEEKS : 15 NOS.                                                                                                   |
| WEEKS                                             | CLASS DAYS                               | THEORY TOPICS                                                                                                            |
| 1ST WEEK                                          | 1ST                                      | Study of setting up an analog and digital link using optical fiber.                                                      |
|                                                   | 2ND                                      | Study of setting up an analog and digital link using optical fiber, with the lab record and rubrics                      |
| 2ND WEEK                                          | 1ST                                      | Measurement of numerical aperture of the plastic fiber provided using 660 nm wavelength.                                 |
|                                                   | 2ND                                      | Measurement of numerical aperture of the plastic fiber provided using 660 nm wavelength, with the lab record and rubrics |
| 3RD WEEK                                          | 1ST                                      | Study of Frequency modulation and demodulation using Optical fiber                                                       |
|                                                   | 2ND                                      | Study of Frequency modulation and demodulation using Optical fiber, with the lab record and rubrics                      |
| 4TH WEEK                                          | 1ST                                      | Study of pulse width modulation and demodulation technique using Optical fiber                                           |
|                                                   | 2ND                                      | Study of pulse width modulation and demodulation technique using Optical fiber, with the lab record and rubrics          |
| 5TH WEEK                                          | 1ST                                      | Study of Characteristics of LASER diode                                                                                  |
|                                                   | 2ND                                      | Study of Characteristics of LASER diode, with the lab record and rubrics                                                 |
| 6TH WEEK                                          | 1ST                                      | Study of I-V Characteristics of Fiber optic LED and Photodetector                                                        |
|                                                   | 2ND                                      | Study of I-V Characteristics of Fiber optic LED and Photodetector, with the lab record and rubrics                       |
| 7TH WEEK                                          | 1ST                                      | Measurement of bending loss and propagation loss in the optical fiber cable                                              |
|                                                   | 2ND                                      | Measurement of bending loss and propagation loss in the optical fiber cable, with the lab record and rubrics             |
| 8TH WEEK                                          | 1ST                                      | Setting up Fiber Optics voice link using Frequency Modulation.                                                           |
|                                                   | 2ND                                      | Setting up Fiber Optics voice link using Frequency Modulation, with the lab record and rubrics                           |
| 9TH WEEK                                          | 1ST                                      | Plot the transcendental equations for the TE modes in a symmetric step index planar waveguide                            |
|                                                   | 2ND                                      | Plot the transcendental equations for the TE modes in a symmetric step index planar waveguide, with the lab record and   |
| 10TH WEEK                                         | 1ST                                      | Plot the transcendental equations for the TM modes in a symmetric step index planar waveguide.                           |
|                                                   | 2ND                                      | Plot the transcendental equations for the TM modes in a symmetric step index planar waveguide, with the lab record and   |
| 11TH WEEK                                         | 1ST                                      | Optical Power management using virtual lab, with the lab record and rubrics                                              |
|                                                   | 2ND                                      | Measurement of numerical aperture using virtual lab, with the lab record and rubrics                                     |
| 12TH WEEK                                         | 1ST                                      | Intensity modulation of laser output through an optical fiber using virtual lab                                          |
|                                                   | 2ND                                      | Intensity modulation of laser output through an optical fiber using virtual lab, with the lab record and rubrics         |

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| 13TH WEEK | 1ST | Measurement of data rate for digital optical link using virtual lab                                  |
|           | 2ND | Measurement of data rate for digital optical link using virtual lab, with the lab record and rubrics |
| 14TH WEEK | 1ST | Measurement of losses in plastic fiber using virtual lab                                             |
|           | 2ND | Measurement of losses in plastic fiber using virtual lab, with the lab record and rubrics            |
| 15TH WEEK | 1ST | Characteristics of APD using virtual lab using virtual lab                                           |
|           | 2ND | Characteristics of APD using virtual lab using virtual lab, with the lab record and rubrics          |



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| <u>LESSON PLAN</u>                                                     |            |                                                                    |                                                                                                                 |
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| ACADEMIC LESSON PLAN FOR SESSION: 2026-27                              |            |                                                                    |                                                                                                                 |
| DISCIPLINE                                                             |            | YEAR                                                               | NAME OF THE TEACHING FACULTY                                                                                    |
| CIVIL ENGG.<br>&<br>ETC ENGG.                                          |            | 1ST                                                                | MRS MANORAMA PADHY, LECT(E&TC)                                                                                  |
| <b>SUBJECT:</b><br>FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGG(TH-6) |            | NO. OF DAYS PER WEEK CLASS ALLOTTED :<br>02                        | SEMESTER FROM 17/08/2026 TO 17/04/2027                                                                          |
|                                                                        |            |                                                                    | NO. OF WEEKS : 32 NOS.                                                                                          |
| WEEKS                                                                  | CLASS DAYS | UNITS                                                              | THEORY TOPICS                                                                                                   |
| 1st Week                                                               | 1ST        | Unit I:<br>Electric and<br>Magnetic Circuits                       | Define Electrical and electronics. Need of electrical and electronics.                                          |
|                                                                        | 2ND        |                                                                    | Definition of EMF, Current, Potential Difference; Ohm's law and                                                 |
| 2nd Week                                                               | 1ST        |                                                                    | relation of V, I & R in series and parallel circuit, voltage and current division rule, Power and Energy        |
|                                                                        | 2ND        |                                                                    | Concept of KCL, KVL: simple problems                                                                            |
| 3rd Week                                                               | 1ST        |                                                                    | Basic Definition of M.M.F, magnetic force, flux, permeability, reluctance, permeance                            |
|                                                                        | 2ND        |                                                                    | Electromagnetic induction, Faraday's laws of electromagnetic induction, Lenz's law; Self and mutual             |
| 4th Week                                                               | 1ST        |                                                                    | Hysteresis loop and BH curve, Analogy between electric and magnetic circuits                                    |
|                                                                        | 2ND        |                                                                    | AC fundamentals: Definitions of Cycle, Frequency, Periodic time, Amplitude, Angular velocity                    |
| 5th Week                                                               | 1ST        | Unit II:<br>A.C. Circuits                                          | RMS value, Average value, Form Factor Peak Factor, phase angle                                                  |
|                                                                        | 2ND        |                                                                    | Mathematical and phasor representation of alternating emf and current                                           |
| 6th Week                                                               | 1ST        |                                                                    | Voltage and Current relationship in Star and Delta connections                                                  |
|                                                                        | 2ND        |                                                                    | A.C in resistors, inductors circuit                                                                             |
| 7th Week                                                               | 1ST        |                                                                    | A.C in Capacitive Circuit, A.C in R-L series Circuit                                                            |
|                                                                        | 2ND        |                                                                    | R-C series, R-L-C series Circuit                                                                                |
| 8th Week                                                               | 1ST        |                                                                    | A.C in R-L parallel                                                                                             |
|                                                                        | 2ND        |                                                                    | A.C in R-C Parallel, R-L-C Parallel Circuit.                                                                    |
| 9th Week                                                               | 1ST        | Unit III:<br>Transformer and<br>DC Machines                        | Power in A. C. Circuits, power triangle                                                                         |
|                                                                        | 2ND        |                                                                    | Concept of Fleming's rules and explain it                                                                       |
| 10th Week                                                              | 1ST        |                                                                    | Construction and Working principle of DC machines                                                               |
|                                                                        | 2ND        |                                                                    | EMF equations of DC machines and applications                                                                   |
| 11th Week                                                              | 1ST        |                                                                    | General construction and principle of different types of Transformer                                            |
|                                                                        | 2ND        |                                                                    | Classification of transformer with construction and principle                                                   |
| 12th Week                                                              | 1ST        |                                                                    | Emf equation of single phase transformers                                                                       |
|                                                                        | 2ND        |                                                                    | Transformation ratio of transformers                                                                            |
| 13th Week                                                              | 1ST        | Unit IV:<br>Measuring<br>instruments,<br>Wiring & Power<br>billing | revision of the above topic                                                                                     |
|                                                                        | 2ND        |                                                                    | Introduction to measuring instruments                                                                           |
| 14th Week                                                              | 1ST        |                                                                    | Explain and classify the types of torques (concept only)                                                        |
|                                                                        | 2ND        |                                                                    | concept of PMMC and MI type instruments and its uses                                                            |
| 15th Week                                                              | 1ST        |                                                                    | Explain 1-phase Ammeter, Voltmeter with connection diagram                                                      |
|                                                                        | 2ND        |                                                                    | Explain wattmeter, energy meter with connection diagram                                                         |
| 16th Week                                                              | 1ST        |                                                                    | Types of wiring for domestic installation (concept only)                                                        |
|                                                                        | 2ND        |                                                                    | calculate energy consumption in a small electric installation                                                   |
| 17th Week                                                              | 1ST        | Unit V:<br>Overview of Basic<br>Electronics &<br>Components        | simple numerical on Wiring & Power billing                                                                      |
|                                                                        | 2ND        |                                                                    | Basic Concept of Electronics and its application                                                                |
| 18th Week                                                              | 1ST        |                                                                    | Basic Concept of voltage, current and power & Electronics components and their classification                   |
|                                                                        | 2ND        |                                                                    | Passive Active Components: Resistances, Capacitors, Inductors, Diodes, Transistors and their                    |
| 19th Week                                                              | 1ST        |                                                                    | Concept of energy band in solids. Classify the solid material.                                                  |
|                                                                        | 2ND        |                                                                    | Define Semiconductor and classify the types. Explain intrinsic and extrinsic semiconductors                     |
| 20th Week                                                              | 1ST        |                                                                    | Definition, Classification and Working of Diode (PN junction, LED, Zener)                                       |
|                                                                        | 2ND        |                                                                    | Transistor: BJT, Concept of FET, MOS and CMOS (Definition, Types, Symbol & Terminals)                           |
| 21st Week                                                              | 1ST        | Unit VI:                                                           | DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal     |
|                                                                        | 2ND        |                                                                    | Define Signals. Explain basic concept of alternating current and direct current                                 |
| 22nd                                                                   | 1ST        |                                                                    | Classification of signals. And definitions of different types of signals. And explain it. Difference between AC |

|           |     |                                                  |                                                                                                       |
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| Week      | 2ND | Overview of<br>Signals & Analog<br>Circuits      | Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources. (Definitions) |
| 23rd Week | 1ST |                                                  | Diode as rectifier – half wave and full wave rectifier (center taped & bridge)                        |
| Week      | 2ND |                                                  | Introduction to Clippers & Clampers (Definitions only) and explain the types.                         |
| 24th Week | 1ST | Unit VII:<br>ICs & OP-Amps                       | Explain the working of Transistor as an amplifier                                                     |
| Week      | 2ND |                                                  | Working of RC Coupled amplifier, Oscillator (only definition & types)                                 |
| 25th Week | 1ST |                                                  | Introduction to ICs, advantages & uses                                                                |
| Week      | 2ND |                                                  | Introduction to Operational Amplifiers. Pin configuration of OPAMP                                    |
| 26th Week | 1ST |                                                  | Basic concept of Ideal OPAMP & Practical OPAMP, Characteristics of Ideal OPAMP                        |
| Week      | 2ND |                                                  | Explain Open loop and closed loop configuration of OPAMP                                              |
| 27th Week | 1ST |                                                  | Explain the different applications of OPAMP                                                           |
| Week      | 2ND |                                                  | Concept of ADDER with the diagram and derive the output voltage                                       |
| 28th Week | 1ST |                                                  | Explain differentiator circuit, derive the output voltage and application of it                       |
| Week      | 2ND |                                                  | Explain integrator circuit, derive the output voltage and application of it                           |
| 29th Week | 1ST | Unit VIII:<br>Overview of<br>Digital Electronics | Introduction to Number system(Binary, Octal, Hexadecimal) and Simple problems of Number system        |
| Week      | 2ND |                                                  | Introduction to Logic Gates and explain each gate with Circuit symbol & Truth table                   |
| 30th Week | 1ST |                                                  | Explain Universal Logic gates and Realization of each gate by using this                              |
| Week      | 2ND |                                                  | State De' Morgans Law                                                                                 |
| 31st Week | 1ST |                                                  | Introduction to Boolean Algebra                                                                       |
| Week      | 2ND |                                                  | Electronic implementation of Boolean operation                                                        |
| 32nd Week | 1ST |                                                  | Implementation of Boolean expression using logic gates (simple problem)                               |
| Week      | 2ND |                                                  | Discussion of the above topic                                                                         |



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| <u>LESSON PLAN</u>                                                            |      |                                             |                                                                                              |
|-------------------------------------------------------------------------------|------|---------------------------------------------|----------------------------------------------------------------------------------------------|
| ACADEMIC LESSON PLAN FOR SESSION: 2026-27                                     |      |                                             |                                                                                              |
| DISCIPLINE                                                                    | YEAR | NAME OF THE TEACHING FACULTY                |                                                                                              |
| CIVIL ENGG.<br>&                                                              | 1ST  | MRS MANORAMA PADHY, LECT(E&TC)              |                                                                                              |
| <u>SUBJECT:</u><br>FUNDAMENTALS OF ELECTRICAL & ELECTRONICS<br>ENGG LAB(PR-7) |      | NO. OF DAYS PER WEEK<br>CLASS ALLOTTED : 02 | SEMESTER FROM 17/08/2026 TO 17/04/2027                                                       |
| WEEKS                                                                         |      | CLASS DAYS                                  | THEORY TOPICS                                                                                |
| 1st Week                                                                      |      | 1ST                                         | Determine the permeability of magnetic material by plotting its B-H curve                    |
| 2nd Week                                                                      |      | 1ST                                         | Measure voltage, current and power in 1-phase circuit with resistive load                    |
| 3rd Week                                                                      |      | 1ST                                         | Study of 1-phase transformer (structure)                                                     |
| 4th Week                                                                      |      | 1ST                                         | Connect single phase transformer and measure input and output quantities. Also determine     |
| 5th Week                                                                      |      | 1ST                                         | Connect single phase transformer and measure input and output quantities. Also determine     |
| 6th Week                                                                      |      | 1ST                                         | Study of different parts of DC machines.                                                     |
| 7th Week                                                                      |      | 1ST                                         | Study of PMMC, MI types of instruments (ammeter, voltmeter).                                 |
| 8th Week                                                                      |      | 1ST                                         | Study of PMMC, MI types of instruments (ammeter, voltmeter), check the lab records and       |
| 9th Week                                                                      |      | 1ST                                         | Study of PMMC, MI types of instruments (wattmeter, energy meter)                             |
| 10th Week                                                                     |      | 1ST                                         | Wiring Connection of Fluorescent lamp/tube light                                             |
| 11th Week                                                                     |      | 1ST                                         | Wiring Connection of Fluorescent lamp/tube light, check the lab records and conduct the      |
| 12th Week                                                                     |      | 1ST                                         | Prepare an electrical switch board to control one light point, one plug point, one fan point |
| 13th Week                                                                     |      | 1ST                                         | Prepare an electrical switch board to control one light point, one plug point, one fan point |
| 14th Week                                                                     |      | 1ST                                         | Prepare a report on power billing(monthly) of a domestic single phase wiring system          |
| 15th Week                                                                     |      | 1ST                                         | Prepare a report on power billing(monthly) of a domestic single phase wiring system, check   |
| 16th Week                                                                     |      | 1ST                                         | Identify various passive and active electronics components                                   |
| 17th Week                                                                     |      | 1ST                                         | Connect resistors in series and parallel combination and measure its value using digital     |
| 18th Week                                                                     |      | 1ST                                         | Connect resistors in series and parallel combination and measure its value using digital     |
| 19th Week                                                                     |      | 1ST                                         | Connect capacitors in series and parallel combination and measure its value using            |
| 20th Week                                                                     |      | 1ST                                         | Use multimeter to measure the value of given resistor and determine the value to confirm     |
| 21st Week                                                                     |      | 1ST                                         | Use multimeter to measure the value of given resistor and determine the value to confirm     |
| 22nd Week                                                                     |      | 1ST                                         | Test the PN-junction diode and LED using digital multimeter                                  |
| 23rd Week                                                                     |      | 1ST                                         | Test the performance of PN-junction diode                                                    |
| 24th Week                                                                     |      | 1ST                                         | Test the performance of PN-junction diode, check the lab records and conduct the viva.       |
| 25th Week                                                                     |      | 1ST                                         | Test the performance of Zener diode                                                          |
| 26th Week                                                                     |      | 1ST                                         | Test the performance of Zener diode, check the lab records and conduct the viva.             |
| 27th Week                                                                     |      | 1ST                                         | Construct the half wave rectifier and analyze the waveform                                   |
| 28th Week                                                                     |      | 1ST                                         | Construct the full wave rectifier and analyze the waveform                                   |
| 29th Week                                                                     |      | 1ST                                         | Construct the full wave rectifier and analyze the waveform, check the lab records and        |

|           |     |                                                                                            |
|-----------|-----|--------------------------------------------------------------------------------------------|
| 30th Week | 1ST | Identify three terminals of a transistor using digital multimeter                          |
| 31st Week | 1ST | Familiarization with different types of logic gates.                                       |
| 32nd Week | 1ST | Familiarization with different types of logic gates, check the lab records and conduct the |

  
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