

| SUBJECT-Th2. ANALOG ELECTRONICS AND OP-AMP |             |                                                                          |                    |        |
|--------------------------------------------|-------------|--------------------------------------------------------------------------|--------------------|--------|
| NAME OF THE FACULTY- Siba Prasad Panda     |             |                                                                          | Lth/Lem.           |        |
| MONTH                                      | MODULE/UNIT | COURSE TO BE COVERED                                                     | TOTAL NO. OF CLASS | REMARK |
| January                                    | UNIT-1      | <b>1 P-N JUNCTION DIODE</b>                                              | <b>06</b>          |        |
|                                            |             | 1. 1 P-N Junction Diode                                                  | 01                 |        |
|                                            |             | 1. 2 Working of Diode                                                    |                    |        |
|                                            |             | 1. 3 V-I characteristic of PN junction Diode.                            | 01                 |        |
|                                            |             | V-I characteristic of PN junction Diode                                  |                    |        |
|                                            |             | 1. 4 DC load line                                                        | 01                 |        |
|                                            |             | 1. 5 Important terms such as Ideal Diode, Knee voltage                   |                    |        |
|                                            |             | 1. 6 Junctions break down.                                               | 01                 |        |
|                                            |             | 1.6.1 Zener breakdown                                                    |                    |        |
|                                            |             | 1.6.2 Avalanche breakdown                                                |                    |        |
|                                            |             | 1. 7 P-N Diode clipping Circuit.                                         | 01                 |        |
|                                            |             | 1.8 P-N Diode clamping Circuit                                           | 01                 |        |
| January                                    | UNIT-2      | <b>2.SPECIAL SEMICONDUCTOR DEVICES</b>                                   | <b>05</b>          |        |
|                                            |             | 2.1 Thermistors, Sensors & barretters                                    | 02                 |        |
|                                            |             | 2. 2 Zener Diode                                                         | 01                 |        |
|                                            |             | 2. 3 Tunnel Diode                                                        | 01                 |        |
|                                            |             | 2. 4 PIN Diode                                                           | 01                 |        |
|                                            | UNIT-3      | <b>3.RECTIFIER CIRCUITS&amp;FILTERS</b>                                  | <b>07</b>          |        |
|                                            |             | 3.1 Classification of rectifiers                                         | 01                 |        |
|                                            |             | 3.2 Analysis of half wave, full wave centre tapped and Bridge rectifiers | 01                 |        |
|                                            |             | 3.2.1 DC output current and voltage                                      | 01                 |        |
|                                            |             | 3.2.2 RMS output current and voltage                                     | 01                 |        |
|                                            |             | 3.2.3 Rectifier efficiency                                               |                    |        |
|                                            |             | 3.2.4 Ripple factor                                                      | 01                 |        |
|                                            |             | 3.2.5 Regulation                                                         |                    |        |
|                                            |             | 3.2.6 Transformer utilization factor                                     | 01                 |        |
|                                            |             | 3.2.7 Peak inverse voltage                                               |                    |        |

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|          |        | 3.3 Filters:<br>3.3.1 Shunt capacitor filter<br>3.3.2 Choke input filter<br>3.3.3 $\pi$ filter                                                         | 01 |  |
| February | UNIT-4 | 4.TRANSISTORS                                                                                                                                          | 07 |  |
|          |        | 4.1 Principle of Bipolar junction transistor                                                                                                           | 01 |  |
|          |        | 4.2 Different modes of operation of transistor                                                                                                         | 01 |  |
|          |        | 4.3 Current components in a transistor                                                                                                                 | 01 |  |
|          |        | 4.4 Transistor as an amplifier                                                                                                                         | 01 |  |
|          |        | 4.5 Transistor circuit configuration & its characteristics<br>4.5.1 CB Configuration<br>4.5.2 CE Configuration<br>4.5.3 CC Configuration               | 03 |  |
| February | UNIT-5 | 5. TRANSISTOR CIRCUITS                                                                                                                                 | 07 |  |
|          |        | 5.1 Transistor biasing                                                                                                                                 | 01 |  |
|          |        | 5.2 Stabilization                                                                                                                                      | 01 |  |
|          |        | 5.3 Stability factor                                                                                                                                   | 01 |  |
|          |        | 5.4 Different method of Transistors Biasing<br>5.4.1 Base resistor method<br>5.4.2 Collector to base bias<br>5.4.3 Self bias or voltage divider method | 04 |  |
| February | UNIT-6 | 6.TRANSISTOR AMPLIFIERS & OSCILLATORS                                                                                                                  | 07 |  |
|          |        | 6.1 Practical circuit of transistor amplifier<br>6.2 DC load line and DC equivalent circuit                                                            | 01 |  |
|          |        | 6.3 AC load line and AC equivalent circuit<br>6.4 Calculation of gain                                                                                  | 01 |  |
|          |        | 6.5 Phase reversal<br>6.6 H-parameters of transistors                                                                                                  | 01 |  |
|          |        | 6.7 Simplified H-parameters of transistors                                                                                                             | 01 |  |

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|              |               | 6.8 Generalised approximate model                                                                                                      | 01         |  |
|              |               | 6.9 Analysis of CB, CE, CC amplifier using generalised approximate model                                                               | 01         |  |
|              |               | 6.10 Multi stage transistor amplifier                                                                                                  | 02         |  |
|              |               | 6.10.1 R.C. coupled amplifier                                                                                                          |            |  |
|              |               | 6.10.2 Transformer coupled amplifier                                                                                                   |            |  |
| <b>March</b> |               | 6.11 Feed back in amplifier                                                                                                            | 01         |  |
|              |               | 6.11.1 General theory of feed back                                                                                                     |            |  |
|              |               | 6.11.2 Negative feedback circuit                                                                                                       |            |  |
|              |               | 6.11.3 Advantage of negative feed back                                                                                                 |            |  |
|              |               | 6.12 Power amplifier and its classification                                                                                            | 01         |  |
|              |               | 6.12.1 Difference between voltage amplifier and power amplifier                                                                        |            |  |
|              |               | 6.12.2 Transformer coupled class A power amplifier                                                                                     | 01         |  |
|              |               | 6.12.3 Class A push - pull amplifier                                                                                                   |            |  |
|              |               | 6.12.4 Class B push - pull amplifier                                                                                                   |            |  |
|              |               | 6.13 Oscillators                                                                                                                       | 02         |  |
|              |               | 6.13.1 Types of oscillators                                                                                                            |            |  |
|              |               | 6.13.2 Essentials of transistor oscillator                                                                                             |            |  |
|              |               | 6.13.3 Principle of operation of tuned collector, Hartley, colpitt, phase shift, wein- bridge oscillator (no mathematical derivations) |            |  |
| <b>March</b> | <b>UNIT-7</b> | <b>7. FIELD EFFECT TRANSISTOR</b>                                                                                                      | <b>06</b>  |  |
|              |               | 7.1 Classification of FET                                                                                                              | 01         |  |
|              |               | 7.2 Advantages of FET over BJT                                                                                                         | 02         |  |
|              |               | 7.3 Principle of operation of BJT                                                                                                      |            |  |
|              |               | 7.4 FET parameters (no mathematical derivation)                                                                                        | 02         |  |
|              |               | 7.4.1 DC drain resistance                                                                                                              |            |  |
|              |               | 7.4.2 AC drain resistance                                                                                                              |            |  |
|              |               | 7.4.3 Trans-conductance                                                                                                                |            |  |
|              |               | 7.5 Biasing of FET                                                                                                                     | 01         |  |
| <b>April</b> | <b>UNIT-8</b> | <b>8. OPERATIONAL AMPLIFIERS</b>                                                                                                       | <b>09Z</b> |  |
|              |               | 8.1 General circuit simple of OP-AMP and IC - CA - 741 OP AMP                                                                          | 01         |  |
|              |               | 8.2 Operational amplifier stages                                                                                                       | 01         |  |
|              |               | 8.3 Equivalent circuit of operational amplifier                                                                                        |            |  |
|              |               | 8.4 Open loop OP-AMP configuration                                                                                                     | 01         |  |

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|  |  | 8.5 OPAMP with fed back          | 01 |  |
|  |  | 8.6 Inverting OP-AMP             |    |  |
|  |  | 8.7 Non inverting OP-AMP         | 01 |  |
|  |  | 8.8 Voltage follower & buffer    | 01 |  |
|  |  | 8.9 Differential amplifier       | 03 |  |
|  |  | 8.9.1 Adder or summing amplifier |    |  |
|  |  | 8.9.2 Sub tractor                |    |  |
|  |  | 8.9.3 Integrator                 |    |  |
|  |  | 8.9.4 Differentiator             |    |  |
|  |  | 8.9.5 Comparator                 |    |  |

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