



NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)



LESSON PLAN

SUBJECT: Th-2 (Analog Electronics and OP-AMP)

Name of the Faculty- Er.SOUMYAJIT ROUT

Branch- Electrical Engineering


Semester- 4th

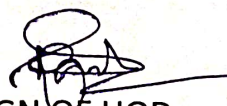
Session- 2024-25

Examination- 2025(s)

CHAPTER WISE DISTRIBUTION OF PERIODS

| Sl.No. | Name of the chapter as per the Syllabus | No. of Periods as per the Syllabus | No. of periods actually needed |
|--------|-----------------------------------------|------------------------------------|--------------------------------|
| 1 | P-N JUNCTION DIODE | 6 | 7 |
| 2 | SPECIAL SEMICONDUCTOR DEVICES | 5 | 8 |
| 3 | RECTIFIER CIRCUITS & FILTERS | 7 | 10 |
| 4 | TRANSISTORS | 7 | 9 |
| 5 | TRANSISTOR CIRCUITS | 7 | 8 |
| 6 | TRANSISTOR AMPLIFIERS & OSCILLATORS | 13 | 15 |
| 7 | FIELD EFFECT TRANSISTOR | 6 | 7 |
| 8 | OPERATIONAL AMPLIFIERS | 9 | 11 |
| TOTAL | | 60 | 75 |


SIGN OF FACULTY


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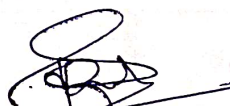
| Discipline: EE | Semester: 4th | Name of the Teaching Faculty: Er. SOUMYAJIT ROUT | |
|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------|
| | | SESSION-2024-25 | EXAMINATION-2025(S) |
| Week | Class Day | Theory / Practical Topics | |
| 1ST | 1 st | P-N JUNCTION DIODE: P-N Junction Diode, Working of Diode | |
| | 2 nd | V-I characteristic of PN junction Diode. | |
| | 3 rd | DC load line Important terms such as Ideal Diode, Knee voltage | |
| | 4 th | Junctions break down Zener breakdown Avalanche breakdown | |
| 2nd | 1 st | P-N Diode clipping Circuit | |
| | 2 nd | Thermistors, Sensors & barretters | |
| | 3 rd | Zener Diode, tunnel Diode, PIN Diode | |
| | 4 th | 3.1 Classification of rectifiers | |
| 3rd | 1 st | Analysis of half wave, full wave centre tapped and Bridge rectifiers and calculate: 3.2.1 DC output current and voltage | |
| | 2 nd | 3.2.2 RMS output current and voltage 3.2.3 Rectifier efficiency | |
| | 3 rd | 3.2.4 Ripple factor 3.2.5 Regulation | |
| | 4 th | 3.2.6 Transformer utilization factor 3.2.7 Peak inverse voltage | |
| 4th | 1 st | 3.3 Filters: 3.3.1 Shunt capacitor filter | |
| | 2 nd | 3.3.2 Choke input filter | |
| | 3 rd | 3.3.3 π filter | |
| | 4 th | RECTIFIER CIRCUITS & FILTERS: Classification of rectifiers | |
| 5th | 1 st | Analysis of half wave, full wave centre tapped and Bridge rectifiers and calculate: | |
| | 2 nd | DC output current and voltage RMS output current and voltage | |
| | 3 rd | DC output current and voltage RMS output current and voltage | |
| | 4 th | Rectifier efficiency Ripple factor Regulation | |

| Week | Class Day | Theory / Practical Topics |
|------|-----------------|-------------------------------------------------------------------------|
| 6th | 1 st | Rectifier efficiency Ripple factor Regulation |
| | 2 nd | Transformer utilization factor Peak inverse voltage |
| | 3 rd | Filters: Shunt capacitor filter |
| | 4 th | Choke input filter π filter |
| 7th | 1 st | TRANSISTORS: Principle of Bipolar junction transistor |
| | 2 nd | Principle of Bipolar junction transistor |
| | 3 rd | Different modes of operation of transistor |
| | 4 th | Current components in a transistor |
| 8th | 1 st | Current components in a transistor |
| | 2 nd | Transistor as an amplifier |
| | 3 rd | Transistor circuit configuration & its characteristics CB Configuration |
| | 4 th | Transistor circuit configuration & its characteristics CB Configuration |
| 9th | 1 st | CE Configuration CC Configuration |
| | 2 nd | TRANSISTOR CIRCUITS: Transistor biasing |
| | 3 rd | Stabilization |
| | 4 th | Stability factor |
| 10th | 1 st | Different method of Transistors Biasing |
| | 2 nd | Different method of Transistors Biasing |
| | 3 rd | Base resistor method |
| | 4 th | Collector to base bias |

| Week | Class Day | Theory / Practical Topics |
|------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 11th | 1 st | Self bias or voltage divider method |
| | 2 nd | TRANSISTOR AMPLIFIERS & OSCILLATORS: Practical circuit of transistor amplifier |
| | 3 rd | DC load line and DC equivalent circuit |
| | 4 th | AC load line and AC equivalent circuit |
| 12th | 1 st | Calculation of gain Phase reversal H-parameters of transistors |
| | 2 nd | Calculation of gain Phase reversal H-parameters of transistors |
| | 3 rd | Simplified H-parameters of transistors Generalised approximate model |
| | 4 th | Analysis of CB, CE, CC amplifier using generalised approximate model |
| 13th | 1 st | Multi stage transistor amplifier R.C. coupled amplifier |
| | 2 nd | Transformer coupled amplifier Feed back in amplifier General theory of feed back |
| | 3 rd | Negative feedback circuit Advantage of negative feed back |
| | 4 th | Power amplifier and its classification Difference between voltage amplifier and power amplifier |
| 14th | 1 st | Transformer coupled class A power amplifier Class A push – pull amplifier Class B push – pull amplifier |
| | 2 nd | Oscillators Types of oscillators |
| | 3 rd | Principle of operation of tuned collector, Hartley, colpitt, phase shift, wein-bridge oscillator (no mathematical derivations) |
| | 4 th | FIELD EFFECT TRANSISTOR: Classification of FET |
| 15th | 1 st | Advantages of FET over BJT |
| | 2 nd | Principle of operation of BJT |
| | 3 rd | FET parameters (no mathematical derivation) DC drain resistance |
| | 4 th | FET parameters (no mathematical derivation) DC drain resistance |

| Week | Class Day | Theory / Practical Topics |
|------|-----------------|---------------------------------------------------------------------------------------------|
| 16th | 1 st | AC drain resistance |
| | 2 nd | Biasing of FET |
| | 3 rd | OPERATIONAL AMPLIFIERS: General circuit simple of OP-AMP and IC – CA – 741 OP AMP |
| | 4 th | Operational amplifier stages Equivalent circuit of operational amplifier |
| 17th | 1 st | Open loop OP-AMP configuration OPAMP with fed back |
| | 2 nd | Inverting OP-AMP Non inverting OP-AMP |
| | 3 rd | Inverting OP-AMP Non inverting OP-AMP |
| | 4 th | Voltage follower & buffer |
| 18th | 1 st | Differential amplifier Adder and summing amplifier |
| | 2 nd | Sub tractor |
| | 3 rd | Integrator Differentiator |
| | 4 th | Comparator |


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