# Bhubanananda Orissa School of Engineering
## Lesson Plan

| **Discipline:** ETC | **Semester:4th** | **Name of the Teaching Faculty:** PRADEEP KUMAR DHAL SAMANT, LECTURER IN ETC ENGG |
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| **Subject:** Analog Electronics & Linear IC | No of Days/per week class allotted:5 (Mon,Tues, Wednes, Thurs, Saturday) | Semester from 10.03.2022 to 10.06.2022<br>No of weeks:14 |
| Week No. | Class Day | Theory Topics |
| 1st | 10-03-2022 | **Unit-1: Diode, Transistors and Circuits**<br>1.1 Working principle of Diode & its current equation, Specification and use of p-n junction diode |
| | 12-03-2022 | 1.2 Breakdown of diode (Avalanche & Zener Breakdown) and Construction, working, Characteristics |
| 2nd | 14-03-2022 | 1.3 Classification of Rectifiers and working of different types of Rectifiers- Half Wave Rectifier, Full Wave Rectifier (CT & Bridge type) |
| | 15-03-2022 | 1.4 Working principle of PNP and NPN transistor |
| | 16-03-2022 | 1.4 Different types of transistor connection (CE, CB & CC). I/P and O/P characteristics of transistor in different connections. |
| | 17-03-2022 | 1.5 Define ALPHA, BETA and GAMMA of transistors in various modes. Establish the Mathematical relationship between them. |
| 3rd | 21-03-2022 | 1.6 Basic concept of Biasing, Types of Biasing, |
| | 22-03-2022 | 1.6 H-parameter model of BJT, load line (AC & DC) and determine the Q-point. |
| | 23-03-2022 | 1.7 Types of Coupling, working principle and use of R-C Coupled Amplifier & Frequency Responses of R-C coupled amplifier & draw the curve. |
| | 24-03-2022 | **Unit-2: Audio Power Amplifiers**<br>2.1 Classify Power Amplifier & Differentiate between Voltage and Power Amplifier |
| | 26-03-2022 | 2.2 Working principle of different types of Power Amplifier (Class-A, Class-B amplifier). |
| 4th | 28-03-2022 | 2.2 Working principle of different types of Power Amplifier (Class-AB, Class-C & Class D amplifier). |
| | 29-03-2022 | 2.3 Construction and working principle and advantages of Push Pull (Class-B) Amplifiers. |
| | 30-03-2022 | **1st Class Test** |
| | 31-03-2022 | **Unit-3: FIELD EFFECT TRANSISTOR (FET)**<br>3.1 FET & its classifications & Differentiate between JFET & BJT |
| | 02-04-2022 | 3.2 Construction, working principle & characteristics of JEFT. |

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| 5th | 04-04-2022 | 3.2 Explain JEFT as an amplifier, parameters of JFET & Establish relation among JFET parameters. |
| | 05-04-2022 | 3.3 Construction & working principle MOSFET. |
| | 06-04-2022 | 3.3 Classification of MOSFET & characteristics (Drain & Transfer) |
| | 07-04-2022 | 3.4 Explain the operation of CMOS, VMOS & LDMOS |
| | 09-04-2022 | **Unit-4: FEED BACK AMPLIFIER & OSCILLATOR** 4.1 Define & classify Feedback Amplifier, principle of negative feedback with the help of block diagram, Types of feedback – negative &positive feedback. |
| 6th | 11-04-2022 | 4.2 Types of negative feedback – voltage shunt, voltage series, current shunt & current series. |
| | 12-04-2022 | 4.2 Characteristics - voltage gain, bandwidth, input impedance, output impedance, stability, noise, distortion in amplifiers. |
| | 13-04-2022 | 4.3 Oscillator -block diagram of sine wave oscillator, Types, Requirement of oscillation- Barkhausen criterion. |
| | 16-04-2022 | 4.4 RC oscillators – RC phase shift & Crystal: Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability. |
| 7th | 18-04-2022 | 4.4 LC oscillators – Colpitts & Hartley Oscillators: Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability. |
| | 19-04-2022 | 4.4 LC oscillators – Wien Bridge Oscillators: Circuit operation, circuit diagram, equation for frequency of oscillation & frequency stability. |
| | 20-04-2022 | **Unit-5: TUNED AMPLIFIER & WAVE SHAPING CIRCUIT** 5.1 Defined and classify Tuned amplifier, Explain parallel Resonant circuit, Resonance Curve & sharpness of Resonance. |
| | 21-04-2022 | 5.2 working principle of Single tuned Voltage& Double tuned Amplifier & its limitation. |
| | 23-04-2022 | 5.3 Different type of Clipper circuit (diode series & shunt clipper circuits). |
| 8th | 25-04-2022 | 5.3 Different type of Clipper circuit (positive & negative biased, combinational clipper circuits) & its application. |
| | 26-04-2022 | 5.4 Different type of Clamper circuit (positive & negative clampers) & its application. |
| | 27-04-2022 | 5.5 Working of Astable Multivibrator with circuit diagram. |
| | 28-04-2022 | 5.5 Working of Monostable Multivibrator with circuit diagram. |
| | 30-04-2022 | 5.5 Working of Bistable Multivibrator with circuit diagram. |

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| 9th | 02-05-2022 | 5.6 Working & use of Integrator circuit using R- C circuit (Linear), input / output waveforms & frequency response. |
| | 04-05-2022 | 5.6 Working & use of Differentiator circuit using R- C circuit (Linear), input / output waveforms & frequency response. |
| | 05-05-2022 | **Unit-6: OPERATIONAL AMPLIFIER CIRCUITS & FEEDBACK CONFIGURATIONS**<br>6.1 Differential amplifier & explain its configuration & significance. |
| | 07-05-2022 | 6.2 Block diagram representation of a typical Op- Amp, its equivalent circuits and draw the schematic symbol. |
| 10th | 09-05-2022 | **1st Internal Assessment** |
| | 10-05-2022 | 6.3 Discuss the types of integrated circuits manufacturer's designations of ICs, Package types, pin identification and temperature and ordering information. |
| | 11-05-2022 | 6.4 Define the following electrical characteristics - input offset voltage, input offset current, CMMR, Large signal voltage gain, Slew rate. |
| | 12-05-2022 | 6.5 Draw and explain the Open Loop configuration (inverting, non-inverting Amplifier) |
| | 14-05-2022 | 6.6 Draw the circuit diagram of the voltage series feedback amplifier and derive the close loop Voltage gain, gain of feedback circuits, input resistance, output resistance, bandwidth and total output offset voltage with feedback. |
| 11th | 17-05-2022 | 6.7 Draw the circuit diagram of the voltage shunt feedback amplifier and derive the close loop Voltage gain, gain of feedback circuits, input resistance, output resistance, bandwidth and total output offset voltage with feedback. |
| | 18-05-2022 | **2nd Class Test** |
| | 19-05-2022 | **Unit-7. APPLICATION OF OPERATIONAL AMPLIFIER, TIMER CIRCUITS & IC voltage regulator**<br>7.1 Discuss the summing scaling and averaging of inverting and non-inverting amplifiers |
| | 21-05-2022 | 7.2 DC & AC Amplifies using OP-AMP. |
| 12th | 23-05-2022 | 7.3 Integrator using op-amp. |
| | 24-05-2022 | 7.3 Differentiator using op-amp. |
| | 25-05-2022 | 7.4 Active filter and describe the filter design of fast order low Pass Butterworth |
| | 26-05-2022 | 7.5 Concept of Zero-Crossing Detector using Op-Amp |
| | 28-05-2022 | 7.6 Block diagram & operation of IC 555 timer and its application. |

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| 13th | 31-05-2022 | 7.6 Block diagram & operation of IC 565 PLL and its application. |
| | 01-06-2022 | 7.7 Working of Current to voltage Convertor using Operational Amplifier |
| | 02-06-2022 | 7.8 Working of the Voltage to Frequency Convertor using Operational Amplifier. |
| | 04-06-2022 | 7.9 Working of the Frequency to Voltage Conversion using Operational Amplifier. |
| 14th | 06-06-2022 | 7.10 Operation of power supply using 78XX and 79XX, LM 317 Series with their PIN configuration |
| | 07-06-2022 | 7.11 Functional block diagram & working of IC regulator LM 723 & LM 317 |
| | 08-06-2022 | **2nd Internal Assessment** |
| | 09-06-2022 | OVERALL REVISION |

08/03/2022
**Signature of Faculty**

08/03/2022.
**HOD(E&TC)**

ACADEMIC COORDINATOR

**Principal**