

# **ANALOG ELECTRONICS LAB (EI181313)**

**Branch and Semester: B. Tech. 3<sup>rd</sup> Semester (EE and IE)**

## **I. Course Objectives:**

1. To understand the basic concept of various electronic devices, circuits and their application.
2. To develop the ability among students to design and implement electronic circuits.

## **II. Course Outcomes:**

After completion of the course the students will be able to

1. To acquire basic knowledge of solid state electronics including diodes, BJT, JFET and operational amplifier.
2. To develop the ability to analyze and design analog electronic circuits using discrete components.
3. To design, construct, and take measurements of various analog circuits to compare experimental results in the laboratory with theoretical analysis.

## **III. Laboratory Manual:** The manual has two parts:

**PART I:** It includes analog circuit experiments to be solved using Virtual lab online simulator designed by IIT Kharagpur. There are six experiments in the manual covering the entire analog electronics syllabus.

**Part II:** It includes five hardware experiments. Students perform the experiments using Electrical and Electronics system trainer (MODEL: XPO-CT)

## **IV. Evaluation:**

Analog Electronics Lab is a single credit course. Continuous evaluation (CE) carries 15 marks and End Semester Examination (ESE) carries 35 marks.

## **V. Laboratory Faculty in-charge:**

1. **Dr. Rhittwikraj Moudgollya, Assistant Professor, IE**
2. **Mrs. Dhritika Saikia, Assistant Professor, EE**
3. **Dr. Mridushmita Sarma, Assistant Professor, EE**

# **LIST OF EXPERIMENTS**

## **Part I (Virtual Lab)**

**Exp 1: Zener diode characteristics and Zener as a voltage regulator**

**Exp 2: Input and output characteristics of transistor CB configuration**

**Exp 3: Input and output characteristics of transistor CE configuration**

**Exp 4: Studies on BJT CE amplifier**

**Exp 5: Studies of basic properties of Operational Amplifier: Inverting and Non-Inverting Amplifiers**

**Exp 6: Studies of differentiator and integrator using Operational Amplifier**

## **Part II (Hardware Experiments)**

**Exp 1: Studies on Rectifiers and Filters**

**Exp 2: Input and output characteristics of transistor CB configuration**

**Exp 3: Input and output characteristics of transistor CE configuration**

**Exp 4: Studies on BJT CE amplifier**

**Exp 5: Studies on common source JFET characteristics**

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## RUBRICS FOR ASSESSMENT

### (Part I & Part II)

Category of evaluation	Components	% Allotment of Marks to the components		
		0-30%	31-60%	61-100%
<b>CONTINUOUS AND COMPREHENSIVE EVALUATION</b>	<b>Attendance and Preparedness (10%)</b>	Student is present but not prepared for the laboratory classes	Student is present but not well prepared	Student is present & familiar with lab manual
	<b>Part I -Ability to do experiments on virtual lab (5%)</b>	Not able to complete the experiment on simulator	Able to complete the experiment on simulator partially	Able to complete the experiment on simulator fully
	<b>Part II – Hardware Experiments (5%)</b>	Not able to complete the experiment	Complete the experiment partially	Complete the experiment fully
<b>RESULT &amp; ANALYSIS</b>	<b>Experiments performance &amp; results findings (10%)</b>	Missing several important details	Missing some important details	Details are well covered
	<b>Reports (30%)</b>	Results contain errors	Results are well presented but have some errors	Results are well presented without any errors
<b>Test &amp; Viva-voce</b>	<b>Familiarity with experiments and knowledge of related concepts (40%)</b>	Able to answer at least 30% questions	Able to answer at least 50% questions	Able to answer at least 80% questions