No	Course Information (2019-2020)	
1	Unit name:	Digital communication I
2	Code:	EcE 31002
3	Classification:	Engineering subject
4	Credit value:	3(2-2-0)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	EcE 21002 & 22001 Communication principles
7	Mode of delivery:	Lecture, Tutorial, Discussion, Presentation
8	Assessment system and breakdown of marks: **Tutorial, Examination**	
	Tutorial	30%
	Mid-term/ final Examination	70%
9	Academic staff teaching unit:	Department of Electronic Engineering
10	Course outcome of unit: In this course, students will be able ❖ To recognize terms and definitions of the communication techniques ❖ To explain the analogue and digital communication techniques ❖ To apply the analogue and digital communication techniques in solving communication system problems	
11	Synopsis of unit: The course introduces students to the study of communication system, its principles and techniques. Course covers the analogue and digital modulation techniques, multiplexing, noise that is the biggest problem of communication, coding techniques. Analogue and digital communication subject is a comprehensive course in electronic engineering and can be applied in the field of communication and any other various applications.	
12	Topic: **1 Definition and terms** 1.1 Introduction 1.2 Frequencies 1.3 Types of signal 1.4 Analogue signal 1.5 Digital signal 1.6 Waveforms 1.7 Measurement of signal level 1.8 Review questions	

	2	**Analogue modulation principles**
		2.1 Introduction
		2.2 Frequency band classifications
		2.3 Modulation techniques
		2.4 Amplitude modulation
		2.5 Frequency division multiplexing
		2.6 Modulation depth
		2.7 Practical circuits
		2.8 Angle modulation
		2.9 Comparison of amplitude, phase and frequency modulation
		2.10 Review questions
	3	**Spread spectrum systems**
		3.1 Introduction
		3.2 Spread spectrum systems
		3.3 Spread spectrum system criteria
		3.4 Reasons for use of spread spectrum systems
		3.5 Pseudorandom cade generators, scramblers and descramblers
		3.6 Types of spread spectrum techniques
		3.7 Advantages and disadvantages of spread spectrum techniques
		3.8 Review questions
	4	**Digital modulation techniques**
		4.1 Introduction
		4.2 Amplitude shift key modulation
		4.3 Frequency shift key modulation
		4.4 Phase shift key modulation
		4.5 Sixteen – quadrature amplitude modulation
		4.6 Bandwidths
		4.7 Differential phase modulation
		4.8 Review question
	5	**Pulse code modulation**
		5.1 Introduction
		5.2 Time division multiplexing
		5.3 Principle of operation
		5.4 Recommended standards
		5.5 The 30/32 channels CEPT PCM system
		5.6 Aliasing distortion
		5.7 Quantising and encoding

	5.8 The 30/32 channel CEPT PCM system operation 5.9 Importance of frame and multiframe alignment 5.10 Alarms 5.11 Dependent regenerative repeaters 5.12 Power feeding 5.13 Review questions 6 **Noise figure and noise temperature** 6.1 Introduction 6.2 Internal noise 6.3 External noise 6.4 System performance 6.5 Noise figure/ noise factor 6.6 Effective noise temperature 6.7 Variation of noise figure with frequency 6.8 Review questions 7 **Effects of noise and distortion on analogue and digital signals** 7.1 Introduction 7.2 Amplitude distortion 7.3 Frequency distortion 7.4 Amplitude and frequency distortion 7.5 Limited bandwidth 7.6 Effects of noise
14	Main references: Analogue and Digital Communication Techniques by Grahmae Smile 1st edition,2002
15	Additional references: 1. Principle of electronic communication systems, 3rd edition, Louis E. Frenzel, Tata McGraw Hill, 2012 2. Question bank in electronics & communication engineering, 3rd edition, Dr. B. R. Gupta and Vandana Singhal, J.S offset, 2012

Approved by

Prepared by

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No	Course Information (2019-2020)	
1	Unit name:	Analogue and Digital Electronics I
2	Code:	EcE – 31025
3	Classification:	Engineering Subject
4	Credit value:	2.5 (2-0-1)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	NA
7	Mode of delivery:	Lecture and Practical
8	Assessment system and breakdown of marks:	Exam, lab report, assignments and tutorial
	Practical	20%
	Tutorial / Assignment	10%
	Mid-Term Examination	70%
	Academic staff teaching unit:	Department of Electronic Engineering
	Course outcome of unit: After completion of this course, students will be able to • describe the basic structure, parameters, characteristics and operations of analog components (diode, transistor, operational amplifier) • calculate the parameters of basic electronic circuits (rectifier circuit, transistor switching circuits and transistor biasing circuits) • measure the characteristics of basic electronic component (diodes, transistor) and demonstrate the basic electronic circuits (rectifier circuit, switching circuit, op amp circuit)	
9	Synopsis of unit: The analog circuit will teach the fundamentals of diode application, BJTs and FET analog circuit design techniques used in today's advanced mixed-signal integrated-circuit applications. Topics to be covered include device/process background, IC passives, analog amplifiers, op-amp design, two thermal devices and other analog circuitry used in today's mixed-signal ICs. The digital circuit will teach the fundamentals of number systems and arithmetic, combinational logic, adder, 555 timer, counter and shift registers systems, frequency response, timing analysis, sequential digital circuit.	

10	Topic:	
	1	**Diodes**
		1.1 Introduction to PN Junction
		1.2 Forward and Reverse Bias of a Diode
		1.3 The Diode Characteristics
		1.4 Important Diode Parameters
		1.5 Diode Testing
		1.6 Load- line Analysis
	2	**Diode Application**
		2.1 Diode Equivalent Circuits
		2.2 Series Diode Configurations with DC Inputs
		2.3 Parallel and Parallel-Series Configuration
		2.4 Half-Wave and Full-Wave Rectifiers
		2.5 Clippers
		2.6 Clamper
	3	**Bipolar Junctions Transistor(BJT)**
		3.1 Basic BJT structures
		3.2 BJT symbols, current and voltage
		3.3 Basic BJT configuration
		3.4 Region of Operation
		3.5 Basic BJT equation
		3.6 Important BJT parameter
		3.7 BJT packages and terminal identification
		3.8 BJT Testing
	4	**DC Biasing -BJT**
		4.1 Operating Point
		4.2 Fixed-bias circuit
		4.3 Emitter-stabilized circuit
		4.4 Voltage divider bias circuit
		4.5 DC bias with voltage feedback
		4.6 Miscellaneous Bias Configurations
		4.7 Biasing circuit design
		4.7 Transistor switch network

		4.8 Troubleshooting techniques
		4.9 Analysis of PNP circuits
	5	**Field- Effect Transistors (FET)**
		5.1 Basic FET structures and symbols
		5.2 FET Configurations and V-I Characteristics
		5.3 Basic FET Equations
		5.4 Important FET Parameters
		5.5 Comparison between BJT and FET
	6	**FET – Biasing**
		6.1 Fixed-bias Configuration
		6.2 Self-bias Configuration
		6.3 Voltage-Divider Biasing
		6.4 Biasing the Deplection type MOSFET
		6.5 Biasing the Enhancement-type MOSFET
		6.6 Review Table of FET Biasing
		6.7 Biasing Circuit Design
	7	**Operational Amplifier**
		7.1 Operational Amplifier Basic
		7.2 The Ideal Operational Amplifier
		7.3 Common Operational Amplifier Circuits
	8	**Two Terminal Devices**
		8.1 Zener Diode
		8.2 Photodiodes
		8.3 Photoconductive Cell
		8.4 Emitters
		8.5 Solar cells
		8.6 Thermistors
11	Main references: Electronic Devices and circuits Third Edition JIMMIE J CATHEY at Laboratory, Electronic Devices Fourth Edition Thomas L Floyd Digital fundamentals 10th Edition Thomas L.Floyd.	
12	Additional references:	

Information on Lab Practical

Lab	Activity
1	Topic: **Testing Diode** Task: • To apply diode and classify forward bias and reverse bias • To discuss voltage and current of diode Resources: Diode, Multimeter, project board, resistor, LED, power supply
2	Topic: **Half-wave Rectifier** Task: • To define about half-wave rectifier • To describe the output waveform of half-wave rectifier Resources: diode , 220V transformer, oscilloscope
3	Topic: **Testing NPN BJT and PNP BJT** Task: • To classify NPN and PNP transistor • To classify base, collector, emitter Resources: transistor , Multimeter
4	Topic : **Transistor as a switch** Task : • To define a transistor can work as a switch • To apply transistor in other circuit Resources : Resistor, transistor, LED, power supply, project board
5	Topic : **Adder** Task : • To discuss the operation principle of adder • To apply the Op-amp and resistor Resources : Resistor, Op-amp, power supply, project board

Daw Pyone Ei Ei Cho
Assistant lecturer
Department of Electronic Engineering

<table>
<tr><td>No</td><td colspan="2">Course Information (2019-2020)</td></tr>
<tr><td>1</td><td>Unit Name :</td><td>Engineering Circuit Analysis I</td></tr>
<tr><td>2</td><td>Unit Code:</td><td>EcE 31001</td></tr>
<tr><td>3</td><td>Classification :</td><td>Engineering Subject</td></tr>
<tr><td>4</td><td>Credit Value :</td><td>3.5 (2-1-2)</td></tr>
<tr><td>5</td><td>Semester /Year Offered :</td><td>1/3</td></tr>
<tr><td>6</td><td>Pre-requisite (if any) :</td><td></td></tr>
<tr><td>7</td><td>Mode of Delivery:</td><td>Lecture, Tutorial and Practical</td></tr>
<tr><td rowspan="4">8</td><td>Assessment System and Breakdown of Marks:</td><td></td></tr>
<tr><td>Practical</td><td>20%</td></tr>
<tr><td>Tutorial/ Assignment</td><td>10%</td></tr>
<tr><td>Examination</td><td>70%</td></tr>
<tr><td>9</td><td colspan="2">Academic Staff Teaching Unit: Department of Electronic Engineering</td></tr>
<tr><td>10</td><td colspan="2">Learning Outcome of Unit:
After completing this unit, students will be able to:
• determine the response of first order RL, RC circuits and second order RLC circuits
• solve the RLC circuits either by using s-domain analysis
• simulate and construct the RL, RC and RLC circuits</td></tr>
<tr><td>11</td><td colspan="2">Synopsis of Unit:
The course covers RL circuits, RC circuits, RLC circuits, Laplace transformation, circuit analysis in the s-domain, frequency response, two-port networks and Fourier analysis.</td></tr>
<tr><td>12</td><td colspan="2">Topics and Contents
Topic 1: Basic RL and RC Circuits
▪ The Source-Free RL Circuit, Properties of the Exponential response
▪ The Source-Free RC Circuit
▪ A more general perspective
▪ The Unit-Step Function
▪ Driven RL Circuits
▪ Natural and Force Response
▪ Driven RC Circuits

Topic 2: The RLC Circuits
▪ The Source-Free parallel circuit
▪ The Overdamped parallel RLC circuit
▪ Critical Damping
▪ The Underdamped parallel RLC circuit</td></tr>
</table>

- The Source-Free series RLC circuit
- The Complete response of the RLC circuit
- The Lossless LC Circuit

Topic 3: Complex Frequency and the Laplace Transform

- Complex Frequency
- The Damped Sinusoidal Forcing Function
- Definition of the Laplace Transform
- Laplace Transforms of simple time functions
- Inverse Transform Techniques
- Basic Theorems for the Laplace Transform
- The Initial-Value and Final-Value Theorem

Topic 4: Circuit Analysis in the s-Domain

- Z(s) and Y(s)
- Nodal and Mesh Analysis in the s-Domain
- Additional Circuit Analysis Techniques
- Poles, Zeros and Transfer Functions
- Convolution
- The Complex-Frequency Plane
- Natural Response and the s-Plane
- A technique for synthesizing the Voltage Ratio $H(s) = V_{out}/V_{in}$

Main References:

1. Engineering Circuit Analysis, Eighth Edition, Willian H-Hayt, Jr.Jack E-Kemmerly, Steven M.Durbin, 2012, ISBN 978-0-07-352957-8

Additional References:

2. Circuit Analysis, John E Whitehouse, 1997, ISBN 1-898563-40-3

Information on Lab Practical

Lab	Activity

1	Topic: Experiment 1: Response of First Order RL Circuit Outcomes: • To determine the time constant of an RL circuit. • To plot the response of the first order RL circuit. Resources: Multisim Software
2	Topic: Experiment 2: Response of First Order RC Circuit Outcomes: • To determine the time constant of an RC circuit. • To plot the frequency response of the first order RC circuit. Resources: Multisim Software
3	Topic: Experiment 3: Response of Second Order RLC Series Circuit Outcomes: • To describe the transient response to a step input. • To observe the second-order circuit response waveforms over-damping, critical damping and underdamping. • To plot the frequency response of second-order circuit Resources: Multisim Software
4	Topic: Experiment 4: Laplace Transform for RLC Circuit Outcomes: • To demonstrate the Laplace transform techniques • To plot the response of a series RLC circuit to a step function using Matlab Resources: Matlab software, Computer
5	Topic: Experiment 5: Wien Bridge Oscillator Circuit

	Outcomes: • To simulate the Wien Bridge oscillator using multisim software. • To find the effect on output frequency with variation in RC combination. Resources: Multisim Software

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Assistant Lecturer

Department of Electronic Engineering

No	Course Information (2019-2020)	
1	Unit name:	Modeling and Control I (2019-2020)
2	Code:	EcE 31003
3	Classification:	Engineering subject
4	Credit value:	3(**2-1-1**)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	EcE 21001&21002 ,Electronics Engineering Circuit
7	Mode of delivery:	Lecture, Practical, Tutorial, Discussion, Presentation
8	Assessment system and breakdown of marks:	Tutorial, Practical, Examination, Lab report
9	Tutorial	10%
	Practical	20%
	Mid-term Examination	70%
10	Academic staff teaching unit:	Electronic Engineering
11	Course outcome of unit: In this course students will be able ❖ To explain the basic open loop and closed-loop system ❖ To know transfer function of electrical systems from mechanical systems ❖ To solve problems by using Laplace transform method, state differential equation and state variable models ❖ To solve problems in control system by using Matlab software	
12	Synopsis of unit:- The course covers the fundamental of process for designing a control system. The course introduces students to understand the purpose of a control systemwhich includes the use of control design strategies, the Laplace transform,the mathematical models of the systems, the transfer function of linear systems and signal flow graph models, the state variables of dynamic systems, the state differential equation, the	

	time response and the state transition matrix, open-loop and closed-loop systems, and sensitivity of control systems to parameter variations and control of the transient response of control systems. Disturbance signals in a feedback control system, steady-state error, test input signals, performance of a second- order system response, estimation relative stability of feedback control systems and the stability of state variable systems will also be learned.
13	Topic: **Chapter** **Title** **1** **Introduction to Control Systems** 1.1 Introduction 1.2 Brief History of Automatic Control 1.3 Example of Control Systems 1.4 Engineering Design 1.5 Control Systems Design 1.6 Mechatronic Systems 1.7 Green Engineering 1.8 The Future Evolution of Control Systems 1.9 Design Examples 1.10 Sequential Design Example: Disk Drive Read System 1.11 Summary **2** **Mathematical Models of Systems** 2.1 Introduction 2.2 Differential Equations of Physical Systems 2.3 Linear Approximations of Physical Systems 2.4 The Laplace Transform 2.5 The Transfer Function of Linear Systems 2.6 Block Diagram Models 2.7 Signal -Flow Graph Models 2.8 Design Examples 2.9 The Simulation of Systems Using Control Design Software 2.10 Sequential Design Example: Disk Drive Read System 2.11 Summary

	3	**State Variable Models** 3.1 Introduction 3.2 The State Variables of a Dynamic System 3.3 The State Differential Equation 3.4 Signal-Flow Graph and Block Diagram Models 3.5 Alternative Signal-Flow Graph and Block Diagram Models 3.6 The Transfer Function from the State Equation 3.7 The Time Response and the State Transition Matrix 3.8 Design Examples 3.9 Analysis of State Variable Models Using Control Design Software 3.10 Sequential Design Example: Disk Drive Read System 3.11 Summary
	1	**Matlab Fundamentals** 1.1 Matlab Basis Operations 1.2 Matrix Operations 1.3 Array Operations 1.4 Complex Numbers 1.5 The Colon Symbol (:) 1.6 M-files
	2	**Plotting Commands** 2.1 Graph Functions 2.2 X-Y Plots and Annotations 2.3 Logarithmic and Polar plots 2.4 Screen Control
	3	**Control Statements** 3.1 For Loops 3.2 If statements 3.3 While loop 3.4 Input/Output Commands

14	Main references: Modern Control System, 11^{th} Edition, Richard C. Dorf and Robert H. Bishop Electronics and Circuit Analysis using MATLAB
15	Additional references: Notes by Modern Control System(11^{st}Edition),Richard C. Dorf and Robert H. Bishop, Prentice-Hall,Upper Saddle... (http://www. Mypearsonstore.com>bookstore)

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Information on Lab Practical (EcE-31003 Modeling and Control)

Lab	Activity
1	**Experiment 1**: **Evaluate the complex number by using MATLAB Software** **Objectives**: • To apply Matlab software as a calculation tools • To apply Matlab/Simulink Software **Equipment required:** • Matlab software, Personal computer
2	**Experiment 2**: **If-else if statement by using MATLAB Software** **Objectives**: • To apply Matlab software as a calculation tools • To apply Matlab/Simulink Software **Equipment required:** • Matlab software, Personal computer
3	**Experiment 3: To plot v(t) and i(t) versus time(t) by using MATLAB Software** **Objectives:** • To apply Matlab software as a calculation tools • To understand the voltage and power calculation • To apply Matlab/Simulink Software **Equipment required:** • Matlab software, Personal computer

<table>
<tr><td>4</td><td>Experiment 4: If-else if statement and For loop repetition statement by using MATLAB Software

Objectives:
• To apply Matlab software as a calculation tools
• To generate the Fibonacci sequence up to the twelfth term
• To convert analog signal x to digital signal y
• To apply Matlab/Simulink Software

Equipment required:
• Matlab software, Personal computer</td></tr>
<tr><td>5</td><td>Experiment 5: To draw a graph of gain versus frequency and x(t) versus y(t) by using MATLAB

Objectives:
• To apply the Matlab software as a calculation tools
• To build the Matlab program to draw Bode Plot of an amplifier using semilogx function
• To determine the value of x(t) and y(t)(t = 0 to 10 ms)
• To plot x(t) versus y(t)
• To apply Matlab/Simulink Software

Equipment required:
• Matlab software, Personal computer</td></tr>
</table>

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No	Course Information (2019-2020)	
1	Unit name:	Engineering Electromagnetic I
2	Code:	EcE 31011
3	Classification:	Engineering subject
4	Credit value:	2.5 (2-1-0)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	Engineering Mathematics, Engineering Physics
7	Mode of delivery:	Lecture
8	Assessment system and breakdown of marks:	Tutorial, Assignment, Examination
	Tutorial, Assignment	30%
	Mid-term/ Final Examination	70%
9	Academic staff teaching unit:	Electronic Engineering
10	Course outcome of unit: After completion of this course, students will be able to 1. Discuss the principles and concepts of electric fields. 2. Apply the appropriate laws, theorems and techniques to solve electric field problems.	
11	Synopsis of unit: This course will provide all students with the fundamental concepts associated with electromagnetic fields. Important topics include: Maxwell's equations; electrostatic and steady- magnetic fields. Successful completion of this course will allow students to study more advanced topics in the area of microwave engineering.	
12	Topic: **Chapter** **Title** **1.** **Vector Analysis** 1.1 Scalar and Vectors 1.2 Vector Algebra 1.3 The Rectangular Coordination System 1.4 Vector Components and Unit Vectors 1.5 The Vector Field 1.6 The Dot Product	

	1.7 The Cross Product 1.8 Other Coordinate System: Circular Cylindrical Coordinates 1.9 The Spherical Coordinate System **2. Coulomb forces and Electric Field Intensity** 2.1 The Experiment Law of Coulomb 2.2 Electric Field Intensity 2.3 Field arising from a continuous volume charge distribution 2.4 Field of a Line Charge 2.5 Field of a Sheet Charge 2.6 Streamlines and Sketches of Fields **3. Electric Flux Density, Gauss's Law, and Divergence** 3.1 Electric Flux Density 3.2 Gauss's Law 3.3 Application of Gauss's Law: Some Symmetrical Charge Distributions 3.4 Application of Gauss's Law: Differential Volume Element 3.5 Divergence and Maxwell's First Equation 3.6 The Vector Operator and The Divergence Theorem **4. Energy and Potential** 4.1 Energy expended in moving a point charge in an electric Fields 4.2 The Line Integral 4.3 Definition of Potential Difference and Potential 4.4 The Potential field of a point charge 4.5 The potential field of a system of charges: conservation Property 4.6 Potential Gradient 4.7 The Electric Dipole 4.8 Energy density in the Electrostatic field
14	Main references: Engineering Electromagnetic, Eighth Edition by William H.Hayt, Jr. and John A. Buck
15	Additional references:

No	Course Information (2019-2020)	
1	Unit name:	Integrated Electronics I (2019-2020)
2	Code:	EcE 31021
3	Classification:	Engineering subject
4	Credit value:	3 (2-1-1)
5	Semester/ Year Offered:	1/3
6	Pre-requisite:	EcE 21011&22011, Microelectronics I & II
7	Mode of delivery:	Lecture, Practical, Tutorial
8	Assessment system and breakdown of marks:	Tutorial, Lab Report , Lab activity
	Tutorial	10%
	Practical	20%
	Mid-term Examination	70%
9	Academic staff teaching unit:	Department of Electronic Engineering
10	Course outcome of unit: In this course, students will be able • To describe operation of various semiconductor devices, switching circuits, amplifier circuit, BJTs and FETs amplifier frequency response. • To calculate the parameters of amplifiers and switching circuits. • To simulate various types of amplifier circuit using Multisim software.	
11	Synopsis of unit: The course introduces students to learn the basics of operational amplifiers and general purpose of op-amp as basic and advanced aspects of analog integrated circuit design and about stability requirements and how to compensate op-amp circuit to ensure stable operation. In practical op-amp circuits, its parameters that will be consider in detail. Application and design of integrated circuits is to increase the skills of designing electronics circuits to meet particular specifications and to perform particular function.	
	Topic:	

	Chapter	**Title**
	10	**Amplifier Frequency Response**
		10–1 Basic Concepts
		10–2 The Decibel
		10–3 Low-Frequency Amplifier Response
		10–4 High-Frequency Amplifier Response
		10–5 Total Amplifier Frequency Response
		10–6 Frequency Response of Multistage Amplifiers
		10–7 Frequency Response Measurements
	11	**Thyristors**
		11–1 The Four-Layer Diode
		11–2 The Silicon-Controlled Rectifier (SCR)
		11–3 SCR Applications
		11–4 The Diac and Triac
		11–5 The Silicon-Controlled Switch (SCS)
		11–6 The Unijunction Transistor (UJT)
		11-7 The Programmable Unijunction Transistor (PUT)
	12	**The Operational Amplifier**
		12–1 Introduction to Operational Amplifiers
		12–2 Op-Amp Input Modes and Parameters
		12–3 Negative Feedback
		12–4 Op-Amps with Negative Feedback
		12–5 Effects of Negative Feedback on Op-Amp Impedances
		12–6 Bias Current and Offset Voltage
		12–7 Open-Loop Frequency and Phase Responses
		12–8 Closed-Loop Frequency Response
		12–9 Troubleshooting
	13	**Basic Op-Amp Circuits**
		13–1 Comparators
		13–2 Summing Amplifiers
		13–3 Integrators and Differentiators
		13–4 Troubleshooting
14	Main references:	

	THOMAS L. FLOYD, ELECTRONIC DEVICES(9th Edition) DONALD A NEAMEN, Microelectronics: Circuit Analysis and Design, 4th Edition S SALIVAHANAN, V S KANCHANA BHAASKARAN; LINEAR INTEGRATED CIRCUITS
15	Additional references: 1:http//www.amazon.com > microelectronics, 2:http//www.pearsonhighrged.com/fioyd 3:http//pdfs.semanticscholar.org>

Information on Lab Practical (Integrated Electronics)

<table>
<tr><th>Lab</th><th>Activity</th></tr>
<tr><td>1</td><td>Experiment: 1 Low Frequency Response of RC Amplifier using Multisim Software
Objectives:
• To constructs the RC amplifier.
• To recognize the low frequency response of amplifier
Require Equipment:
• Computer & Multisim Software</td></tr>
<tr><td>2</td><td>Experiment: 2 Inverting and Non-inverting Amplifier using Multisim Software
Objectives:
• To construct the Inverting and Non-inverting Amplifier.
• To recognize the phase variations of input and output waveform.
Require Equipment:
• Computer & Multisim Software</td></tr>
<tr><td>3</td><td>Experiment: 3 Comparator circuit using Multisim Software
Objectives:
• To construct the comparator circuit.
• To recognize the output waveform.
Require Equipment:
• Computer & Multisim Software</td></tr>
</table>

4	**Experiment: 4 Summing Amplifier circuit using Multisim Software** **Objectives**: • To construct the Summing Amplifier circuit. • To recognize the output waveform. **Require Equipment**: • Computer & Multisim Software
5	**Experiment: 5 Integrator and Differentiator circuit using Multisim Software** **Objectives**: • To construct the Integrator and Differentiator circuit. • To recognize the output waveform. **Require Equipment**: • Computer & Multisim Software