Alva's Institute of Engineering & Technology
Shobhavana Campus, Mijar, Moodbidri, D.K – 574225
Phone: 08258-262725, Fax: 08258-262726
Accredited by NAAC with 'A+' & NBA (ECE & CSE)

Department of Electronics and Communication Engineering

SEMESTER – IV	Academic Year: 2023- 2024 (Even Sem)
Course Code: BEC402	Course Name: Principles of Communication Systems
Course Teacher: Dr. Napolean A	

Course Outcomes: After studying this course, students will be able to,

CO Numbers	Course Outcomes	Blooms Level	Target Level
BEC402.1	Identify and associate the random variables and random process in Communication system design	L1,L2 L3	2
BEC402.2	Identify the schemes for analog modulation and demodulation and compare their performance.	L1,L2,L3	2
BEC402.3	Understand the principles of analog communication systems and noise modelling	L1,L2,L3	2
BEC402.4	Design of PCM systems through the processes sampling, quantization and encoding	L1,L2,L3	2
BEC402.5	Describe the ideal condition, practical considerations of the signal representation for baseband transmission ofdigital signals	L1,L2,L3	2

CO-PO/PSO Mapping Matrix:

CO Numbers	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BEC402.1	3	3											3		
BEC402.2	3	3	3		2								3	3	2
BEC402.3	3	3	3		2								3	3	2
BEC402.4	3	3	3		2								3	3	2
BEC402.5	3	3	3										3	3	
SUM	15	15	12		6								15	12	6
AVERAGE	3	3	3		2								3	3	2

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Justification of Course Outcome and Program Outcome Mapping

CO	POs	Level	Justification
BEC402.1	PO1	3	Strongly mapped as the students will be able to apply the knowledge gained to understand the concepts of random variables and process in communication techniques.
	PO2	3	Strongly mapped as the students will be able to formulate the Gaussian distribution function.
	PSO1	3	Strongly mapped as the students will be able to understand and apply the needs of function of random variables in analog communications.
BEC402.2	PO1	3	Strongly mapped as the students will be able to apply the basic mathematical knowledge in the Amplitude modulation communication.
	PO2	3	Strongly mapped as students will be able to analyze the amplitude modulated and demodulated signals.
	PO3	3	Strongly mapped as students will be able to give a solution for the optimized modulator and detector circuit design in amplitude modulation technique.
	PO5	2	Mapped as the students will be able to use a modern simulation tool to predict the response of Amplitude modulation using MATLAB tool.
	PSO1	3	Strongly mapped as students will be able to understand the basic function of amplitude modulation technique and its broadcasting systems.
	PSO2	3	Strongly mapped as students will be able to design a Frequency division multiplexing circuits in communications applications.
	PSO3	2	Mapped as the students will be able to apply modern software tools to design and test a response of amplitude modulator for the different modulation index value.
BEC402.3	PO1	3	Strongly mapped as the students will be able to apply the basic mathematical relation between phase, angle and frequency knowledge in frequency modulation.
	PO2	3	Strongly mapped as students will be able to formulate the frequency modulator techniques in communication transmitters.
	PO3	3	Strongly mapped as students will be able to design a frequency conversion techniques in a communication receiver models for societal considerations.
	PO5	2	Mapped as the students will be able to design and test a RF Transmitter and receiver circuit by using a simulation tool.
	PSO1	3	Strongly mapped as students will be able to understand the basic principles of frequency modulation and side bands of transmitter system.

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CO	POs	Level	Justification
	PSO2	3	Strongly mapped as the students will be able to design and implement analog communication systems using the super heterodyne receiver technique.
	PSO3	2	Strongly mapped as the students will be able to apply a modern hardware designing of various frequency mixing circuits.
BEC402.4	PO1	3	Strongly mapped as the students will be able to understand basic engineering fundamentals of impulse signals on sampling process.
	PO2	3	Strongly mapped as students will be able to formulate the basic steps in pulse amplitude modulation techniques.
	PO3	3	Strongly mapped as students will be able to design a successful communication model by converting analog to digital domain by the process of sampling and digital modulation techniques.
	PO5	2	Mapped as the students will be able to use a simulation tool to verify the sampling theorem and verify the pulse amplitude modulation process.
	PSO1	3	Strongly mapped as students will be able to understand the different types electronic circuits involved in the generation and detection PPM waves.
	PSO2	3	Strongly mapped as students will be able to design the pulse code modulation technique by using the suitable analog and digital electronics concepts.
	PSO3	2	Mapped as the students will be able to use a modern software tools to test the sampling and TDM process.
BEC402.5	PO1	3	Strongly mapped as the students will be able to derive the expression for the various types of noises associated in the receivers by applying the basic science and mathematical knowledge.
	PO2	3	Strongly mapped as the students will be able to formulate, the noise level in communication cascaded systems.
	PO3	3	Strongly mapped as students will be able to give a solution for the distortion transmission system to the public.
	PSO1	3	Strongly mapped as students will be able to understand the different types of noises and its effects in analog modulation.
	PSO2	3	Strongly mapped as the students will be able to design and implement communication systems by considering the effect of noises and signal to noise ratio.

Course Teacher

IQAC Coordinator
Mr. Sudhakara H M

Siddesh
HOD
Dr. Siddesh G K

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Department of Electronics and Communication Engineering

SEMESTER – III	Academic Year: 2023- 2024
Course Code: BEC306A	Course Name: Electronic Devices
Course Teacher: Dr. Napolean A	

Course Outcomes: After studying this course, students will be able to,

CO Numbers	Course Outcomes	Blooms Level	Target Level
BEC306A.1	Understand the principles of semiconductor physics	L1,L2 L3	2
BEC306A.2	Understand the principles and characteristics of different types of semiconductor devices	L1,L2,L3	2
BEC306A.3	Utilize the mathematical models of semiconductor junctions for circuits and systems	L1,L2,L3	2
BEC306A.4	Identify the mathematical models of MOS transistors for circuits and systems.	L1,L2,L3	2
BEC306A.5	Understand the fabrication process of semiconductor devices	L1,L2,L3	2

CO-PO/PSO Mapping Matrix:

CO Numbers	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
BEC306A.1	3	3											3		
BEC306A.2	3	3	3										3	3	
BEC306A.3	3	3	3										3	3	
BEC306A.4	3	3	3										3	3	
BEC306A.5	3	3	3										3		2
SUM	15	15	12										15	9	2
AVERAGE	3	3	3										3	3	2

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Justification of Course Outcome and Program Outcome mapping

CO	POs	Level	Justification
BEC306A.1	PO1	3	Strongly mapped as the students will be able to apply the knowledge gained to understand the principle of semiconductor physics and its needs.
	PO2	3	Strongly mapped as the students will be able to formulate the physics behind the electronic semiconductor devices
	PSO1	3	Strongly mapped as the students will be able to understand and apply the needs of semiconductor physics in analog and digital electronics.
BEC306A.2	PO1	3	Strongly mapped as the students will be able to apply the basic semiconductor science knowledge in the electronics and communication engineering
	PO2	3	Strongly mapped as students will be able to analyze the different types of semiconductor diode structures and its working
	PO3	3	Strongly mapped as students will be able to give a solution for the energy saving light sources like LED for the consumer electronics applications
	PSO1	3	Strongly mapped as students will be able to understand the basic function of current flow functions in the various diodes
	PSO2	3	Strongly mapped as students will be able to design a rectifier and optoelectronic diodes for the electronics applications
BEC306A.3	PO1	3	Strongly mapped as the students will be able to study the basic BJT switching operation.
	PO2	3	Strongly mapped as students will be able to identify and formulate the transistor various operating regions
	PO3	3	Strongly mapped as students will be able to design the basic switching and amplification electronic device
	PSO1	3	Strongly mapped as students will be able to understand the amplification and switching effects of the BJT in analog and digital electronics.
	PSO2	3	Strongly mapped as the students will be able to design and implement a BJT using semiconductor technology

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CO	POs	Level	Justification
BEC306A.4	PO1	3	Strongly mapped as the students will be able to understand basic needs of JFET and MOSFET devices
	PO2	3	Strongly mapped as students will be able to formulate the basic mathematical equations which are related to voltage and current in the FET operation
	PO3	3	Strongly mapped as students will be able to design a successful amplifier design by using the JFET and MOSFET devices
	PSO1	3	Strongly mapped as students will be able to understand the different types of the FET and its working
	PSO2	3	Strongly mapped as the students will be able to design and implement a JFET and MOSFET using semiconductor technology
BEC306A.5	PO1	3	Strongly mapped as the students will be able to understand the steps involved in IC fabrication process.
	PO2	3	Strongly mapped students will able to identify the suitable fabrication process for the CMOS technology
	PO3	3	Strongly mapped as students will be able to fabricate a junction diodes by using semiconductor fabrication process
	PSO1	3	Strongly mapped as students will be able to understand and apply the semiconductor process steps in the IC fabrication
	PSO3	2	Mapped as students will be able to fabricate a diode structure by using a modern chemical vapour deposition and photolithography process.

Course Teacher	IQAC Coordinator	HOD
Dr. Napolean A	Mr. Sudhakara H M	Dr. Siddesh G K