Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students

- Class rooms
- Department Notice Boards
- Laboratories
- Faculty meetings
- Professional Body meetings

Professor & Head
Dept. of Electronics & Communication En.
Adichunchanagiri Institute of Technology,
Chikmugalur - 577 102

COURSE OBJECTIVES AND OUTCOMES-2023-2024

Course Title : PRINCIPLES OF COMMUNICATION SYSTEMS	Course Code: BEC-402
No. of Lecture Hrs./Week : 03+2	Exam Hours : 03
Total No. of Lecture Hrs. : 40	Exam Marks : 50

Prerequisites

1	Probability theory
2	Fourier transforms.
3	Basics of Communication systems

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Understand and analyze concepts of Analog Modulation schemes viz; AM, FM
2	Design and analyze the electronic circuits for AM and FM modulation and demodulation.
3	Understand the concepts of random variable and random process to model communication systems.
4	Understand and analyze the concepts of digitization of signals.
5	Evolve the concept of SNR in the presence of channel induced noise

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
BEC -402.1	Identify and associate the random variables and random process in Communication system design.	L2
BEC -402.2	Understand the principles of analog communication systems and noise modeling.	L2
BEC -402.3	Identify the schemes for analog modulation and demodulation and compare their performance	L2
BEC -402.4	Design of PCM systems through the processes sampling, quantization and encoding.	L2, L3
BEC -402.5	Describe the ideal condition, practical considerations of the signal representation for baseband transmission of digital signals.	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BEC-402.1	2	2			1									
BEC-402.2	2	2			2								2	
BEC-402.3	2	2			2								2	
BEC-402.4	2	2			2								2	
BEC-402.5	2	2			2								2	

## CO-PO Mapping Justification
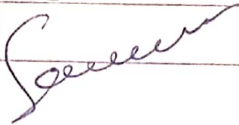
BEC -402.1	PO1	2	Understand the concepts of Random Variables and Processes
	PO2	2	Analyze the problems related to random variables and processes
	PO5	1	Analyze the Random signals using Matlab
BEC -402.2	PO1	2	Understand the basics of AM and FM. performance analysis in presence of noise
	PO2	2	Analyze AM and FM related problems
	PO5	2	Analyze the spectrums of AM and FM using Matlab
BEC -402.3	PO1	2	Understand the design of modulators and demodulator circuits
	PO2	2	Able to solve the problems of modulator and demodulator circuits
	PO5	2	Able to design modulators and demodulators using Matlab.
BEC -402.4	PO1	2	Understand digital formatting processes with quantization noise.
	PO2	2	Analyse the concepts of digital formatting process
	PO5	2	Able to design PCM systems using Matlab.
BEC -402.5	PO1	2	Understands and analyse the digital transmission and reception.
	PO2	2	Analyzes the Transmission and reception related issues.
	PO5	2	Able to display the signal and its spectrum of an audio signal.

CO-PSO Mapping Justification

CO-PSO MAPPING JUSTIFICATION

CO/PSO	PSO1	JUSTIFICATION
BEC -402.2	2	Able to understand and analyze the performance of AM and FM systems
BEC -402.3	2	Able to analyze and design modulators and demodulator circuits
BEC -402.4	2	Able to analyze the digital formatting systems
BEC -402.5	2	Able to understand and Analyzes the Transmission and reception related issues.

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Manjula U R	
		Anitha K.T	
2	Course Coordinator	Manjula U R	
3	Module Coordinator	Dr. A P Jagadeesh Chandra	
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	

COURSE OBJECTIVES AND OUTCOMES - 2023-24

Course Title : Microwave Theory and Antennas	Course Code: 21EC62
No. of Lecture Hrs./Week : 03+02 practical	Exam Hours : 03
Total No. of Lecture Hrs. : 40 hrs + 12 Lab slots	Exam Marks : 50

Prerequisites

1	Basic knowledge of microwave frequency and its Application
2	Fundamentals of Field theory and Wave Propagation

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Describe the Microwave properties and its transmission media.
2	Describe the Microwave devices for several applications.
3	Understand the basics of Antenna theory.
4	Select Antennas for applications.

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
21EC62.1	Describe the use and advantages of microwave transmission. Identify various parameters related to transmission lines and Strip lines.	L2
21EC62.2	Identify microwave devices for several applications.	L2
21EC62.3	Understand the basic antenna parameters and design of antennas.	L2
21EC62.4	Study the different types of antennas and their applications.	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
21EC62.1	3	2											2	1
21EC62.2	3	2											2	
21EC62.3	3	2											2	
21EC62.4	3	2											2	

CO-PO Mapping Justification

21EC62	21EC62.1	PO1	3	Apply knowledge to identify the parameters of transmission lines and Strip lines
		PO2	2	Understand the parameters and advantages of transmission line.
	21EC62.2	PO1	3	Identify various microwave properties and its applications
		PO2	2	Apply knowledge of microwave passive devices and strip lines
	21EC62.3	PO1	3	Analyse various antenna parameters
		PO2	2	Identify the antenna design
	21EC62.4	PO1	3	Analyse different types of antennas
		PO2	2	Identify applications of various types of antenna

CO-PSO Mapping Justification

21EC62	21EC62.1	PSO1	2	Graduate will have an ability to identify microwave transmission lines and its properties.
		PSO2	1	Graduates will be able to use smith chart to solve transmission line problems.
	21EC62.2	PSO1	2	Graduate will have knowledge of microwave device application.
	21EC62.3	PSO1	2	Graduate will have an ability to identify several parameters of antenna.

	21EC62.4	PSO1	2	Graduate will have an ability to illustrate different types of antennas and its applications.

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Nagaveni C.R	23/05/24
2	Course Coordinator	Dr. Suma M	23/05/24
3	Module Coordinator	Dr. A.P Jagadish Chandra	23/5/24
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	23/5/24

COURSE OBJECTIVES AND OUTCOMES - 2023-24

Course Title : Wireless and Cellular Communication	Course Code: 18EC81
No. of Lecture Hrs./Week : 03	Exam Hours : 03
Total No. of Lecture Hrs. : 40	Exam Marks : 60

Prerequisites

1	Principles of Communication
2	Computer Communication Networks
3	Digital Communication

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Understand the concepts of mobile radio propagation and its mechanisms, fading, multipath and cellular system.
2	Understand the overview of GSM network and system architecture and its operations.
3	Discuss the basics of CDMA technology and its network and system architecture.
4	Describe the overview of LTE system architecture, its functional standards, modulation used for wireless cellular operation. Discuss the concept of radio resources.

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
18EC81.1	Understand the concepts of mobile radio propagation and its mechanisms, fading, multipath and cellular system.	L2
18EC81.2	Understand the overview of GSM network and system architecture and its operations.	L2

18EC81.3	Discuss the basics of CDMA technology and its network and system architecture.	L2
18EC81.4	Describe the overview of LTE system architecture, its functional standards, modulation used for wireless cellular operation. Discuss the concept of radio resources.	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
18EC81.1	2	1				3	2					2	2	1
18EC81.2	2					3	2					1	2	1
18EC81.3	2					3	2					2	2	1
18EC81.4	3					3	2					2	2	1

CO-PO Mapping Justification
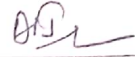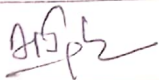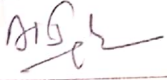
18EC81	18EC81.1	PO1	2	Understand free-space propagation and cellular concept.
		PO2	1	Identify the concepts of propagation mechanisms.
		PO6	3	Enhances the basic concepts of wireless mobile communication.
		PO7	2	Identify the air propagation mechanisms.
		PO12	2	Understand various essentials in cellular system.
	18EC81.2	PO1	2	Understand GSM and TDMA technologies.
		PO6	3	Enhances the basic concepts of GSM in mobile communication.
		PO7	2	Understand air interface.
		PO12	1	Identify the developments in GSM technologies.
	18EC81.3	PO1	2	Understand CDMA technology.
		PO6	3	Improvements in CDMA.

		PO7	2	Understand air interface.
		PO12	1	Identify the developments in GSM technologies.
	18EC81.3	PO1	2	Understand CDMA technology.
		PO6	3	Improvements in CDMA.
		PO7	2	Understand the air interface.
		PO12	2	Identify the developments in CDMA.
	18EC81.4	PO1	3	Improvement in the knowledge of LTE and OFDMA.
		PO6	3	Understand the contentious development of LTE.
		PO7	2	Understand air interface.
		PO12	2	Improve the knowledge of uplink and downlink radio resources.

CO-PSO Mapping Justification

18EC81	18EC81.1	PSO1	2	Students will be able to analyse the wireless communication system.
		PSO2	1	Students will be able to analyse the problems of propagation in communication system.
	18EC81.2	PSO1	2	Students will be able to analyse the GSM applications in wireless communication system.
		PSO2	1	Students will be able to identify the changes in GSM architecture.
	18EC81.3	PSO1	2	Students will be able to analyse the CDMA applications in wireless communication system.
		PSO2	1	Students will be able to identify the types of CDMA .
	18EC81.4	PSO1	2	Students will be able to analyse the uses of LTE in wireless communication system.
		PSO2	1	Students will be able to analyse the uses of LTE in wireless communication system.

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Dr.Vani H R Dr.Jagadishchandra A P	
2	Course Coordinator	Dr.Jagadishchandra A P	
3	Module Coordinator	Dr.Jagadishchandra A P	
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	

COURSE OBJECTIVES AND OUTCOMES - 2023-24

Course Title : Computer Organization and Architecture	Course Code: BEC306C
No. of Lecture Hrs./Week : 03	Exam Hours : 03
Total No. of Lecture Hrs. : 40	Exam Marks : 50

Prerequisites

1	Digital logic design
2	Operating system

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Understand the basic organization of a computer system.
2	Demonstrate the addressing modes, instruction formats and program control statement.
3	Understand different ways of accessing an input / output device including interrupts
4	Demonstrate the organization of different types of semiconductor and other secondary storage memories.
5	Demonstrate organization of simple processor, based on hardwired control and micro programmed control.

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
BEC306C.1	Understand the basic sub system of a computer, their organization, structure and operation.	L2
BEC306C.2	Explain the concept of programs as sequence of machine instructions.	L2
BEC306C.3	Understand basics of I/O data transfer	L2

	synchronization, interrupts and direct memory access methods.	
BEC306C.4	Explain different types of memories and virtual memory concept.	L2
BEC306C.5	Explain the processor implementation by hardwired and microprogrammed control.	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
BEC306C.1	2												2	
BEC306C.2	2												2	
BEC306C.3	2	1	1										2	
BEC306C.4	2	2	2										2	
BEC306C.5	2												2	

CO-PO Mapping Justification
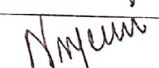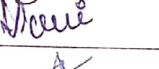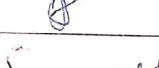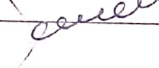
BEC306C	BEC306C.1	PO1	2	Understand the fundamentals of Computer Organization and apply the engineering knowledge to explain the operation of computers
	BEC306C.2	PO1	2	Apply the engineering knowledge to write assembly language programs.
	BEC306C.3	PO1	2	Understand the fundamentals of I/O communication and standard interface. Hence apply the engineering knowledge to solve problem related to communication.
		PO2	1	Analyse interconnections of the systems to communicate with outside world using I/O communication.
		PO3	1	Design different methods of communication with I/O devices as per the requirements.
	BEC306C.4	PO1	2	Understand the fundamentals of memory systems and cache Memories and apply the engineering knowledge in designing memory systems.
		PO2	2	Identify the constraints in designing the memory and cache memory as per the performance requirement.

		PO3	2	Design alternatives in designing memory and cache memory systems
	BEC306C.5	PO1	2	Apply the engineering knowledge to implement both hardwired and microprogrammed control

CO-PSO Mapping Justification

BEC306C	BEC306C.1	PSO1	2	Graduates can analyse structure of a computer system
	BEC306C.2	PSO1	2	Graduates can analyse and program for different processors by knowing the instruction format and its working.
	BEC306C.3	PSO1	2	Graduates can understand and analyse multiple devices handling connected to a computer system.
	BEC306C.4	PSO1	2	Graduates will be able to analyse the requirement of different types of memory systems in a computer system
	BEC306C.5	PSO1	2	Graduates will be able to understand and analyse the processor internal organization and execution

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Nagaveni C.R	
2	Course Coordinator	Dr. Kumuda T	
3	Module Coordinator	Dr. H.R. Vani	
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	

COURSE OBJECTIVES AND OUTCOMES - 2023-24

Course Title : Computer Networks	Course Code: 21EC53
No. of Lecture Hrs./Week : 03	Exam Hours : 03
Total No. of Lecture Hrs. : 40	Exam Marks : 60

Prerequisites

1	Computer Networks
2	Data Communication and Networking

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Understand the layering architecture of OSI reference model and TCP/IP protocol suite.
2	Understand the protocols associated with each layer.
3	Learn the different networking architectures and their representations
4	Learn the various functions and services associated with each layer

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
21EC53.1	To understand different layers of OSI and TCP/IP model and protocol of DLL & MAC	L2
21EC53.2	To understand Connecting Devices, MAC, Characteristics and architecture of wired & wireless LAN ,VLAN.	L2
21EC53.3	To understand different services, protocol & routing algorithm pertaining to Network Layer	L2
21EC53.4	To understand different services, protocol of transport layer and services & protocol of UDP & TCP	L2
21EC53.5	To understand different services and architectural protocol of Application layer	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
21EC53.1	2	1										1	2	
21EC53.2	2	1										1	2	
21EC53.3	2	1										1	2	
21EC53.4	2	1										1	2	
21EC53.5	2	1										1	2	

CO-PO Mapping Justification

21EC53	21EC53.1	PO1	1	The comparison between OSI model and TCP/IP allows the student to better understand TCP/IP protocol suite
		PO2	1	Concept of services provided by DLL makes student to understand how protocol helps a packet at network layer find the link layer address of the next node for delivery of the frame that encapsulates the packet
		PO12	2	Students can apply the knowledge acquired on different layer functions to interpret the quality of network
	21EC53.2	PO1	2	Students will get knowledge of various connecting devices used at each layers and understands how these devices can create loops and find some solutions if they connect LAN with broadcast domain. They also gain knowledge about how membership in VLAN can be defined.
		PO2	1	Concepts of network architecture, addressing mechanism and packet format of wired and wireless network allows students to understand the way in which access is controlled in these types of networks
		PO12	1	Students can apply the knowledge acquired on various channel access techniques helps in analyzing and interpreting the quality of the network
	21EC53.3	PO1	2	Student will understand how network layer is implemented in TCP/IP protocol suite through packetizing, forwarding and routing. They will understand the format of IPv4 datagram, purpose of fragmentation, option field and some security issues related to datagram. Students will also gain the knowledge of difference between class full and classless addressing, how DHCP assigns address in an organization and how NAT is used to relieve shortage of

					address to some extent
		PO2	1		Students will understand the issue related to address change when people temporarily move their device from one place to another. Students will also understand three phases involved in this process their inefficiency and some solutions. Student will understand general idea behind unicast routing, common routing algorithm used in the internet and few routing protocols associated with it.
		PO12	1		Understanding the various end to end protocols helps in analyzing and interpreting the quality of networks and also helps in research based works
	21EC53.4	PO1	2		Student will understand the general structure of transport layer such as process to process communication, addressing, multiplexing, demultiplexing, error control, flow control and congestion control.
		PO2	1		The general structure of transport layer protocol helps students to better understand the design of transport layer protocol in internet such as UDP, TCP, and SCTP and can compare the efficiency of different protocol.
		PO12	2		Students can apply the knowledge acquired on various protocols of transport layer for communication over internet
	21EC53.5	PO1	2		Student will understand the general structure and services provided by Application layer
		PO2	1		Understanding the standard client and server protocol helps students to better analyze the architecture of WWW, HTTP, FTP, TELNET, DNS and its security.
		PO12	2		Students can apply the knowledge acquired on various protocols of Application layer for efficiently utilizing available network for data communication in reality

CO-PSO Mapping Justification

21EC53	21EC53.1	PSO1	2	Student will be able to analyze how packets are send and received at the node
	21EC53.2	PSO1	2	Student will be able to analyze the network of wired and wireless Ethernet LAN
	21EC53.3	PSO1	2	Student will be able to analyze how packet is forwarded based on destination address, labels, and can describe routing algorithm
	21EC53.4	PSO1	2	Student will be able to analyze how process to process communication takes place using different transport layer protocols.
	21EC53.5	PSO1	2	Student will be able to analyze how different data communication takes place using Application layer protocols.

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Dr.Vani H R	
		Mr. MadhuPrakash R	
2	Course Coordinator	Dr.Vani H R	
3	Module Coordinator	Dr.Jagadishchandra A P	
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	

COURSE OBJECTIVES AND OUTCOMES - 2023-24

Course Title : Cryptography		**Course Code:** 18EC744
No. of Lecture Hrs./Week : 03		**Exam Hours** : 03
Total No. of Lecture Hrs. : 40		**Exam Marks** : 100

Prerequisites

1	Engineering mathematics
2	
3	

Course Learning Objectives

This course will help students to achieve the following objectives:

1	Understand the classical cryptography algorithms
2	Understand the concepts of symmetric key and public key cryptography.
3	Understand the different types of pseudorandom sequence generation process required for stream cipher operations.
4	Apply the mathematical concepts for encryption and decryption algorithms

Course Outcomes

At the end of the course students should be able to:

CO Number	Course Outcomes	Cognitive Level
18EC744.1	Describe the encryption and decryption techniques and algorithms used in crypto systems	L3
18EC744.2	Illustrate the concepts of number theory and finite fields applicable to cryptosystems.	L3

18EC744.3	Describe the set of procedures and computations used in public key cryptosystems	L3
18EC744.4	Classify the different types of stream ciphers along with its functional characteristics.	L2

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2
8EC744.1	2	1	1												
EC744.2	2	2													2
EC744.3	2	2													
EC744.4	2	2													2
															1
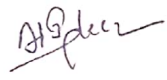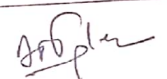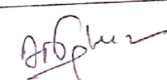
CO-PO Mapping Justification

18EC744	18EC744.1	PO1	2	Uses the modern algebra and matrix computations in defining encryption and decryption algorithms.
		PO2	1	Understands the problems associated with the data security and analyze various cipher systems.
		PO3	1	Design solutions for cryptography problems to meet the specified needs for the safety factors in data communication.
	18EC744.2	PO1	2	Applying the knowledge of mathematics and engineering fundamentals to define a computationally strong cryptosystem.
		PO2	2	Formulate engineering problems associated with the data security
	18EC744.3	PO1	2	Use mathematical models to define different types of public key cryptosystems.
		PO2	2	Formulate problems associated with the public key cryptosystems.
	18EC744.4	PO1	2	Identify the cryptographic standards to formulate security issues
		PO2	2	Cryptographic standards or processes that meet the needs with appropriate consideration for the safety issues.

CO-PSO Mapping Justification

	18EC744.1	PSO1	2	Analyze the cryptography algorithms used in secure data communication.
18EC744	18EC744.2	PSO1	1	Use of modular arithmetic operations in design of cryptographic systems.
	18EC744.3	PSO1	2	Public key cryptosystems are used in digital certificate where an organization or an individual can provide authentication.
	18EC744.4	PSO1	1	The algorithms are described with digital standards; hence it can be adapted to the internet with minimum modifications.

Coordinators:

Sl. No	Coordinator	Name	Signature
1	Faculty In-charge	Dr. A P Jagadeesh Chandra	
2	Course Coordinator	Dr. A P Jagadeesh Chandra	
3	Module Coordinator	Dr. A P Jagadeesh Chandra	
4	IQAC	Mr. MadhuPrakash R	
5	Programme Coordinator	Dr. Goutham M A	

DEPARTMENTAL MEMO'S