Shri. B. V. V. Sangha's

Basaveshwar Engineering College, Bagalkote

Vision and Mission of the Institute

VISION

To be recognized as a premier technical institute committed to developing exemplary professionals, offering research based innovative solutions and inspiring inventions for holistic socio economic development.

MISSION

1) To pursue excellence through student centric dynamic teaching-learning processes, encouraging freedom of inquiry and openness to change
2) To carry out innovative cutting edge research and transfer technology for industrial and societal needs
3) To imbibe moral and ethical values and develop compassionate, humane professionals

Shri. B. V. V. Sangha's

Basaveshwar Engineering College, Bagalkote
Department of Electronics and Communication Engineering

Vision and Mission of the Department

VISION

"To be recognized and respected as one of India's premier academic departments and centers of professional excellence in the area of Electronics and Communication Engineering".

MISSION

1. To impart quality technical education in the field of Electronics and Communication Engineering
2. To carryout cutting edge research through innovations for the benefit of mankind

POs

a) **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

b) **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

c) **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

d) **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

e) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

f) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

g) **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

h) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

i) **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

j) **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

k) **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

l) **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PSOs

(1) Analyze and design systems for Electronics, Communication, and Signal Processing applications.

(2) Use domain specific tools for design, analysis, synthesis, and Validation of VLSI and embedded systems.

(3) Demonstrate the conceptual knowledge with respect to architecture, design analysis and simulation of computer networking and applications.

Program Educational Objectives (PEOs)

In order to prepare the students to excel in industry and higher education, the following Program Educational Objectives (PEOs) are framed.

PEO1: To prepare students to excel in postgraduate programmes or to succeed in industry/technical profession through global, rigorous education.

PEO2: To provide students with a solid foundation in mathematical, scientific, electronics and communication engineering, interdisciplinary subjects necessary to formulate, solve, and analyze engineering challenges.

PEO3: To train students with good scientific and engineering breadth so as to comprehend, analyze, design and create novel products and solutions for the real-life problems.

PEO4: To inculcate in students professional and ethical attitudes, academic environment, aware of excellence, effective communication skills, leadership and managerial skills, ethical codes and guidelines and the lifelong learning needed for a successful professional career.

PEO5: To strengthen the knowledge of students in multi-disciplinary areas of engineering. To inculcate research attitude among students to meet the societal needs.

ANNEXURE

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE

SCHEME OF TEACHING AND EXAMINATION

B.E. (Electronics & Communication Engineering) **w.e.f. 2023-24**

I SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1.	ASC (IC)	22UMA101C	Mathematics for Electrical Sciences - I	Maths Dept.	3	0	2	0	5	50	50	100	4
2.	ASC (IC)	22UPH105C	Physics for Electrical Sciences	Physics Dept.	3	0	2	0	5	50	50	100	4
3.	ESC	22UEC113C	Basic Electronics	Dept.	3	0	0	0	3	50	50	100	3
4.	ESC-I	22UCS120E	Introduction to C Programming	CSE Dept.	2	0	2	0	4	50	50	100	3
5.	ETC-I	22UEC134B	Introduction to Embedded System	Dept.	3	0	0	0	3	50	50	100	3
6.		22UEC135B	Introduction to Communication Technology										
7.	HSMC	22UHS124C	Communicative English	HSS Dept.	1	0	0	0	1	50	50	100	1
8.	HSMC	22UHS125C	Indian Constitution	HSS Dept.	1	0	0	0	1	50	50	100	1
9.	AEC	22UHS128C	Scientific Foundations of Health	Dept.	1	0	0	0	1	50	50	100	1
				Total	17	0	06	0	23	**400**	**400**	**800**	**20**

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE

SCHEME OF TEACHING AND EXAMINATION

B.E. (Electronics & Communication Engineering) **w.e.f. 2023-24**

II SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1.	ASC (IC)	22UMA201C	Mathematics for Electrical Sciences - II	Maths Dept.	3	0	2	0	5	50	50	100	4
2.	ASC (IC)	22UCH209C	Chemistry for Electrical Sciences	Chemistry Dept.	3	0	2	0	5	50	50	100	4
3.	ESC	22UME223C	CAED	Civil / Mechanical Dept.	2	0	2	0	4	50	50	100	3
4.	ESC-I	22UEC114N/ 214N	Engineering Science Course-I (Introduction to Electronics Engineering)	Respective Dept.	3	0	0	0	3	50	50	100	3
5.	PLC-I	22UCS231B	Introduction to Python Programming	CSE Dept.	2	0	2	0	4	50	50	100	3
6.	HSMC	22UHS224C	Professional Writing Skills in English	HSS Dept.	1	0	0	0	1	50	50	100	1
7.	HSMC	22UHS226C	Sanskritika Kannada	HSS Dept.	1	0	0	0	1	50	50	100	1
8.		22UHS227C	Balake Kannada										
9.	AEC	22UHS229C	Innovation and Design Thinking	Dept.	1	0	0	0	1	50	50	100	1
				Total	14	0	06	0	20	**400**	**400**	**800**	**20**

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE, BAGALKOTE

SCHEME OF TEACHING AND EXAMINATION

B.E. (Electronics & Communication Engineering) **w.e.f. 2023-24**

III SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	BSC	22UMA301C	Partial Differential Equations and Integral Transforms	Maths Dept.	3	0	0	0	3	50	50	100	3
2	IPCC	22UEC302C	Semiconductor Devices and Circuits	Dept.	3	0	2	3	8	50	50	100	4
3	IPCC	22UEC303C	Digital Electronics and Logic Design	Dept.	3	0	2	3	8	50	50	100	4
4	PCC	22UEC304C	Network Analysis	Dept.	3	0	0	2	5	50	50	100	3
5	IPCC	22UEC305C	Data Structures using “C”	Dept.	3	0	2	3	8	50	50	100	4
6	AEC	22UBT340C	Biology for Engineers	BT Dept.	2	0	0	0	2	50	50	100	2
7	PCC	21UMA300M	Bridge Course Mathematics – I*	Maths Dept.	3*	0	0	0	3*	50*	50*	100*	0
	MC	NS	National Service Scheme (NSS)	NSS CO	0	0	2	0	2	100	-	100	0
		PE	Physical Education (PE)(Sports and Athletics)	PED									
		YO	Yoga	PED									
				Total	17	0	8	11	36	**400**	**300**	**700**	**20**
					20*	0*	8*	11	39*	**450***	**350***	**800***	**20**
		AAP	AICTE Activity Points (Applicable for both Regular and Lateral Entry students)	50 hours community service to be documented and produced for the examination 10 Points of Allied Service to be documented and produced for the examination									

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE,

B.E. (Electronics & Communication **w.e.f. 2023-**

IV SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1.	BSC	22UMA401C	Statistics and Probability Distributions	Maths Dept.	3	0	0	0	3	50	50	100	3
2.	PCC	22UEC402C	Signals and Systems	Dept.	3	0	0	2	5	50	50	100	4
3.	IPCC	22UEC403C	Analog Circuit Design	Dept.	3	0	2	3	8	50	50	100	4
4.	IPCC	22UEC404C	Analog and Digital Communication	Dept.	3	0	2	3	8	50	50	100	4
5.	IPCC	22UEC405C	ARM Microcontroller	Dept.	3	0	2	3	8	50	50	100	4
6.	HSSM	22UHS424C	Universal Human Values - II	HSS Dept.	1	0	0	0	1	50	50	100	1
7.	PCC	22UMA400M	Bridge Course Mathematics – II*	Maths Dept.	3*	0	0	0	3*	50*	50*	100*	0
	MC	NS	National Service Scheme (NSS)	NSS CO	0	0	2	0	2	100	-	100	0
		PE	Physical Education (PE)(Sports and Athletics)	PED									
		YO	Yoga	PED									
				Total	16	0	8	11	35	**400**	**300**	**700**	**20**
					19*	0	8*	11	38*	**450***	**350***	**800***	**20**
		AAP	AICTE Activity Points (Applicable for both Regular and Lateral Entry students)	50 hours community service to be documented and produced for the examination 10 Points of Allied Service to be documented and produced for the examination									

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE,

B.E. (Electronics & Communication **w.e.f. 2023-**

V SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	IPCC	22UEC501C	Digital Signal Processing	Dept.	3	0	2	3	8	50	50	100	4
2	PCC	22UEC502C	Control Engineering	Dept.	3	0	0	2	5	50	50	100	3
3	PCC	22UEC503C	Computer Networks	Dept.	3	0	0	2	5	50	50	100	3
4	PEC	22UEC506E	Internet of Things	Dept.	3	0	0	0	3	50	50	100	3
		22UEC507E	Verilog Programming										
		22UEC508E	Mobile Communication										
		22UEC509E	Speech Processing										
5	AEC	22UHS521C	Quantitative Aptitude and Professional Skills	Placement Dept.	2	0	0	0	2	50	50	100	2
6	OEC	22UEC508N	Wireless Networks	Dept.	3	0	0	0	3	50	50	100	3
		22UEC532N	Digital Electronics and Microcontrollers										
7	HSSM	22UBT522C	Environmental Studies	BT Dept.	1	0	0	0	1	50	50	100	1
8	MP	22UEC511P	Mini Project	Dept.	0	0	4	0	4	50	50	100	2
	MC	NS	National Service Scheme (NSS)	NSS CO	0	0	2	0	2	100	-	100	0
		PE	Physical Education (PE)(Sports and Athletics)	PED									
		YO	Yoga	PED									
				Total	18	0	8	7	33	**500**	**400**	**900**	**21**
		AAP	AICTE Activity Points (Applicable for both Regular and Lateral Entry students)	50 hours community service to be documented and produced for the examination 10 Points of Allied Service to be documented and produced for the examination									

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BASAVESHWAR ENGINEERING COLLEGE,

B.E. (Electronics & Communication **w.e.f. 2023-**

VI SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PCC	22UEC601C	Information Theory and Coding	Dept.	3	0	0	2	5	50	50	100	3
2	PCC	22UEC602C	Electromagnetic Theory	Dept.	2	2	0	2	6	50	50	100	3
3	PCC	22UEC603C	CMOS Digital VLSI Design	Dept.	3	0	0	2	5	50	50	100	3
4	PCC	22UEC614C	Fiber Optics and Networks	Dept.	3	0	0	2	5	50	50	100	3
5	AEC	22UEC615C	Java Programming	Dept.	2	0	0	2	4	50	50	100	1
6	PEC	22UEC616E	Micro Eelectro Mechanical Systems	Dept.	3	0	0	0	3	50	50	100	3
		22UEC607E	Computer Organization										
		22UEC615E	Embedded Systems										
		22UEC617E	Digital Verification										
7	OEC	22UEC609N	Sensor Technology	Dept.	3	0	0	0	3	50	50	100	3
		22UEC610N	Image Processing										
8	PR	22UEC608P	Project Work	Dept.	0	0	6	0	6	--	---	--	0
	MC	NS	National Service Scheme (NSS)	NSS CO	0	0	2	0	2	100	-	100	0
		PE	Physical Education (PE)(Sports and Athletics)	PED									
		YO	Yoga	PED									
				Total	19	2	8	10	39	**450**	**350**	**800**	**19**
		AAP	AICTE Activity Points (Applicable for both Regular and Lateral Entry students)	50 hours community service to be documented and produced for the examination 10 Points of Allied Service to be documented and produced for the examination									

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE,

B.E. (Electronics & Communication **w.e.f. 2023-**

VII SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1	PCC	22UEC701C	Microwaves and Antenna	Dept.	3	0	0	2	5	50	50	100	3
2	PEC	22UEC711E	DSP Algorithms and Architecture	Dept.	3	0	0	0	3	50	50	100	3
		22UEC712E	Machine Learning										
		22UEC713E	RTL to GDS2										
		22UEC714E	Multimedia Communication										
3	PEC	22UEC715E	Multi-rate Signal Processing	Dept.	3	0	0	0	3	50	50	100	3
		22UEC716E	Cyber Security										
		22UEC717E	IC Technology										
		22UEC718E	Operating Systems										
4	HSSM	22UEC709N	Human Resource and Management	Dept.	3	0	0	0	3	50	50	100	3
5	PR	22UEC708P	Project Work	Dept.	0	0	6	0	6	50	50	100	12
				Total	12	0	06	2	20	**250**	**250**	**500**	**24**
		AAP	AICTE Activity Points (Applicable for both Regular and Lateral Entry students)	50 hours community service to be documented and produced for the examination 10 Points of Allied Service to be documented and produced for the examination									

B. V. V. Sangha

BASAVESHWAR ENGINEERING COLLEGE,

B.E. (Electronics & Communication **w.e.f. 2023-**

VIII SEMESTER

Sl. No.	Course and Course Code		Course Title	Teaching / Paper setting Dept.	Teaching hrs./week				Examination				Credits
					Lecture	Tutorial	Practical/ Drawing	Self-Study Component	Duration in hrs.	CIE Marks	SEE Marks	Total Marks	
					L	T	P	S					
1.	AEC	22UECXXXX	MOOCs	Online	0	0	0	0	0	0	0	0	3
2.	OEC	22UECXXXX	MOOCs	Online	0	0	0	0	0	0	0	0	3
3.	INT	22UEC801T	Internship	Industry	0	0	0	0	0	50	50	100	10
				Total	0	0	0	0	0	**50**	**50**	**100**	**16**

Syllabus for

B.E. I & II – Semester

for academic year 2023 – 2024

(For students admitted to I year in 2023-24)

I Semester Syllabus

SUBJECT CODE: 22UEC113C	Basic Electronics	Credits: 03
L:T:P – 3-0-0		CIE Marks: 50
Total Hours/Week: 03		SEE Marks: 50

UNIT-I	10 Hrs.
Semiconductor Diodes: Introduction, PN junction diode, characteristics and parameters, diode approximations, DC load line analysis **Diode Applications:** Introduction, half wave rectification, full wave rectification, full wave rectifier power supply: Capacitor filter circuit, voltage multiplier, diode logic gates **Zener Diodes:** Junction breakdown, circuit symbol and package, characteristics and parameters, equivalent circuit, Zener diode voltage regulator. Self-study component: ESAKI diode and its working	
UNIT–II	**10 Hrs.**
Bipolar Junction Transistors: Introduction, BJT voltages and currents, common base characteristics, common emitter characteristics, common collector characteristics, **BJT Biasing:** Introduction, DC load line and bias point, BJT amplification, voltage divider bias. **Amplifier and Oscillator:** Single stage CE-amplifier, RC-phase shift oscillator, LC oscillator Self -study component: BJT as a switch	
UNIT–III	**10 Hrs.**
Operational Amplifiers: Introduction, the operational amplifier, block diagram representation of typical op-amp, schematic symbol, op-amp parameters - gain, input resistance, output resistance, CMRR, slew rate, bandwidth, input offset voltage, input bias current and input offset current, the ideal op-amp, equivalent circuit of op-amp, open loop op-amp configurations, differential amplifier, inverting & non inverting amplifier **Op-Amp Applications:** Inverting configuration, non-inverting configuration, differential configuration, voltage follower, integrator, differentiator Self-study component: Op-Amp as zero crossing detector	
UNIT–IV	**10 Hrs.**
Boolean Algebra and Logic Circuits: Binary numbers, number base conversion, octal & hexadecimal numbers, complements, basic definitions, axiomatic definition of Boolean algebra, basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, digital logic gates **Combinational logic:** Introduction, design procedure, adders- half adder, full adder Communications: Introduction to communication, communication system, modulation Self-study component: Half subtractor and full subtractor	
Reference Books *	
1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. 2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-	

0417-84.

3. D P Kothari, I J Nagrath, 'Basic Electronics', 2nd edition, McGraw Hill Education (India),Private Limited, 2018

Course Outcomes**

After completion of the course student will be able to

1. Understand and analyze the applications of semiconductor diodes.
2. Analyze the operation of BJT and its applications.
3. Identify and analyze the different configurations of operational amplifier.
4. Design simple logic circuits using logic gates and understand the need for modulation for communication.

* **Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	-	2	1	-	-	1	-	-	-	3	-	-
CO2	3	3	2	-	2	1	-	-	1	-	-	-	3	-	-
CO3	3	3	2	-	2	1	-	-	1	-	-	1	3	-	-
CO4	3	3	2	-	2	1	-	-	1	-	-	1	3	-	-

SUBJECT CODE: 22UEC134B	Introduction to Embedded System	Credits: 03
L:T:P – 3-0-0		CIE Marks: 50
Total Hours/Week: 03		SEE Marks: 50

UNIT-I	10 Hrs.
Introduction to embedded systems, Embedded system vs. general computing system, Classifications, Purpose of embedded system, Major application areas. The typical embedded system, Microcontrollers, Microprocessors, RISC, CISC, Harvard and Von-Neumann, Big Endian, Little Endian processors.	
UNIT–II	**10 Hrs.**
Memory, Sensors, Actuators, Communication interface: Inter Integrated Interface, Serial Peripheral interface, UART, Parallel interface, RS232 and Bluetooth. Characteristics and quality attributes of embedded systems.	
UNIT–III	**10 Hrs.**
General purpose processors software: Introduction, Basic architecture, Operation, Instruction set, program and data memory space, registers, I/O, interrupts, Operating System, ASIP's, Microcontrollers, DSP, Selecting Microprocessor. Standard Single Purpose Processors peripherals: Introduction, Timers, Counters and watch dog timers, UART.	
UNIT–IV	**10 Hrs.**
8051 Microcontroller: Introduction, Features of 8051 Microcontroller, Block diagram, ALU, PC, ROM, RAM, Address line, Data line, Special function registers, RAM organization, Stack, Basics of Serial Communication, Interrupts, Timers and counters, Input output ports, simple pseudo code.	

Reference Books *

1. Shibu K V, "Introduction to embedded systems", Tata McGraw Hill private limited, 2010.
   Frank Vahid, Tony Givargis, "Embedded system design: A unified hardware/software
2. introduction", John Wiley and Sons, 2001.
3. Kenneth J Ayala, "The 8051 Microcontroller, Architecture programming and applications", West publishing company, college and school division, 1997.
4. Rajkamal, "Embedded systems: architecture, programming and design", Tata McGraw Hill private limited, second edition.

Course Outcomes**

After completion of the course student will be able to

1. **Gain comprehensive knowledge about embedded systems, major application area of embedded systems and processor architectures.**
2. **Analyze communication interfaces, characteristics and quality attributes of embedded systems.**
3. **Identify general purpose processors software and processor peripherals necessary for embedded systems.**
4. **Explore 8051 Microcontroller capabilities and able to write pseudo codes.**

*** Books to be listed as per the format with decreasing level of coverage of syllabus**
**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1	1	-	1	1	1	1	1	1	-	1		3	
CO2	3	2	2	-	1	1	1	1	1	2	-	1		3	
CO3	3	2	2	-	1	2	1	1	2	1	-	2		3	
CO4	3	2	2	-	1	2	1	1	2	1	-	2		3	

SUBJECT CODE: 22UEC135B	Introduction to Communication Technology	Credits: 03
L:T:P – 2:-0-2-0		CIE Marks: 50
Total Hours/Week: 03		SEE Marks: 50

UNIT-I	10 Hrs.

Introduction to communication systems: Elements of communication systems, Need for modulation, Electromagnetic spectrum and applications, Terminologies in communication systems

Introduction to wireless .communication systems: Evolution of mobile radio communication, Beginning of Radio, Wireless mobile communication, Applications of wireless communication, Disadvantages of wireless communication systems, Examples of wireless communication systems, Difference between fixed telephone network and wireless telephone network, Development of wireless communication, Fixed network transmission hierarchy, Comparison of wireless communication systems

UNIT–II	10 Hrs.

Modern communication systems: Introduction, First generation (1G), Second generation (2G), Generation (2.5G), Third generation (3G), Evolution from 2G to 3Gt, Fourth generation (4G), Digital cellular parameters, Differences between analog cellular and digital cellular systems, wireless local loop (WLL), wireless local area networks (WLANs), Personal Area Networks (PANs), Bluetooth

Introduction to cellular mobile systems: Introduction, Spectrum allocation, International telecommunication union (ITU), Wireless communication system, Basic components of cellular systems, Cellular system architecture, GSM: Most popular cellular system, type of channels, Cell concept in wireless communication, shape selection of the cell

UNIT–III	10 Hrs.

Cellular system design fundamentals: Introduction, Frequency reuse, Cellular capacity increasing parameters, channel assignment strategies, Hand-off strategies, Hands-off Initiation, Type of hands-off on the basis of decision making process, channel assignment strategies for hands-off, Interference, Tracking, Trunking, Grade of service

UNIT–IV	10 Hrs.

Multiple access techniques for wireless communication: Introduction, Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Advanced TDMA, Multipath interference, Comparison between TDMA & FDMA, Space Division Multiple Access (SDMA), Spread spectrum, types of spread spectrum, Code Division Multiple Access (CDMA)

Radio wave propagation: Introduction, Doppler shift, parameters of multipath channels, fading, diversity techniques, free space propagation model, Phenomenon of propagation, Propagation models

Reference Books *

1. George Kennedy, Bernard Davis, S R M Prasanna, “Electronic Communication Systems”, Tata McGraw Hill Education Private Limited, New Delhi, 5th Edition
2. RajeshwarDass, “Wireless Communication Systems”, I. K. international Publishing House Pvt. Ltd., New Delhi

Course Outcomes**

After completion of the course student will be able to

1. **Analyze different communication systems with respect to operation and utility.**
2. **Choose suitable modulation technique for cellular mobile systems.**
3. **Decide specific channel multiple access techniques for a communication application.**
4. **Choose specific communication standards for a given communication application.**

*** Books to be listed as per the format with decreasing level of coverage of syllabus**

**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	2	3	-	2	2	-	-	-	-	-	-		3	
CO2	3	3	2	-	2	1	-	-	-	-	-	-		3	
CO3	3	2	3	-	3	-	1	-	-	-	-	-		3	
CO4	2	1	1	-	3	1	1	-	-	-	-	-		3	

IInd Semester Syllabus

SUBJECT CODE: 22UEC114N/22UEC214N	Introduction to Electronics Engineering	Credits: 03
L:T:P – 3-0-0		CIE Marks: 50
Total Hours/Week: 03		SEE Marks: 50

UNIT-I	10 Hrs.
Power Supplies –Block diagram, PN Junction Diode Characteristics, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Output resistance and voltage regulation, Voltage multipliers. **BJT Characteristics and Biasing**- Common Base and Common Emitter Configurations, Voltage Divider Biasing. **Self study component:** Switched Mode Power Supply.	
UNIT–II	**10 Hrs.**
Amplifier and Oscillators – Single Stage CE Amplifier, Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage astable oscillator, Crystal controlled oscillators (Only Concepts, working, and waveforms. No mathematical derivations) **Operational amplifiers** - Ideal op-amp; characteristics of ideal and practical op-amp; Practical op-amp circuits: Inverting and non-inverting amplifiers, voltage follower, summer, integrator, differentiator.(Text 1) **Self study component:** Op-Amp as zero crossing detector	
UNIT–III	**10 Hrs.**
Boolean Algebra and Logic Circuits: Binary numbers, Number Base Conversion, octal &Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates **Combinational logic**: Introduction, Design procedure, Adders- Half adder, Full adder, Parallel Adder **Self study component:** Half subtractor and full subtractor	
UNIT–IV	**10 Hrs.**
Analog Communication Schemes – Modern communication system scheme, Information source, and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Multiplexing, Types of communication systems. Types of modulation (only concepts) – AM , FM. **Digital Modulation Schemes**: Advantages of digital communication over analog communication, ASK, FSK, PSK, Radio signal transmission Multiple access techniques. **Sensors and Interfacing** – Instrumentation and control systems, Transducers, Sensors. **Self study component:** Opto-couplers	
Reference Books *	
1. Mike Tooley, 'Electronic Circuits, Fundamentals & Applications', 4th Edition, Elsevier, 2015. 2. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-84.	

3. D P Kothari, I J Nagrath, 'Basic Electronics', 2nd edition, McGraw Hill Education (India),Private Limited, 2018

Course Outcomes**

After completion of the course student will be able to

1. Differentiate and analyze the applications of electronic devices and circuits.
2. Analyze the operation of oscillators, op amps and its applications.
3. Analyze different number systems and logic circuits built with basic gates.
4. Decide type of transducer, sensor and modulation technique for a given application.

* **Books to be listed as per the format with decreasing level of coverage of syllabus**
**** Each CO to be written with proper action word and should be assessable and quantifiable**

Course Outcomes	Programme Outcomes (POs)												Program Specific Outcomes (PSOs)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	3	2	-	2	2	-	-	-	-	-	-	3	-	-
CO2	3	2	3	-	2	1	-	-	-	-	-	-	3	-	-
CO3	3	2	3	-	3	-	-	-	1	-	-	-	3	-	-
CO4	3	1	1	-	2	1	-	-	1	-	-	1	3	-	-