List of New Course(s) Introduced

Department : *Electronics and Communication Engineering*

Programme Name : *B.Tech.*

Academic Year : 2017-18

List of New Course(s) Introduced

Sr. No.	Course Code	Name of the Course
01.	EC5TPC07	Lic & Its Application
02.	EC5TPC08	Communication System- II
03.	EC5TPC09	Electromagnetic Field Theory
04.	EC5TPE01	Microprocessor & Its Application
05.	EC5TPE02	Data Structure & Operating System
06.	EC5TOE11	Computer Architecture
07.	EC5TOE12	OOP in C++
08.	EC5TOE13	Introduction to Information Security
09.	EC5TOE14	Project Management
10.	EC5TOE15	Rural Technology and Community Development
11.	EC6TPC10	Digital Signal Processing
12.	EC6TPC11	Antenna & wave prapogation
13	EC6TPE03	Data Communication & Computer Networking
14	EC6TPE04	Fundamental of VLSI Design
15	EC6T0E21	UNIX, Operating System
16	EC6T0E22	Probability & Stochastic Process
17	EC6T0E23	Advanced Instrumentation
18	EC6T0E24	Knowledge management
19	EC6T0E25	Engineering System Design Optimization

विभागाध्यक्ष (इलें. एव संचार अभियाँत्रिकी)
H.O.D. (Elect. & Comm. Engineering)
प्रौद्योगिकी संस्थान
Institute of Technology
गु. घा. वि., बिलासपुर (छ.ग.)
G. G. V. Bilaspur (C.G.)

Minutes of Meetings (MoM) of Board of Studies (BoS)

Academic Year : 2017-18

School : *School of Studies of Engineering and Technology*

Department : *Electronics and Communication Engineering*

Date and Time : *June 03, 2017 – 11:00 AM*

Venue : *E-Class Room*

The scheduled meeting of member of Board of Studies (BoS) of Department of Electronics and Communication Engineering, School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur was held to design and discuss the B. Tech. Third year (V and VI semesters) scheme and syllabi.

The following members were present in the meeting:

1. Prof. Shrish Verma (External Expert Member BoS, Dept. of ECE, NIT Raipur)
2. Mr. Avinash Singh Verma (Industrial External Expert Member BoS,
3. Mr. Nipun Kumar Mishra (HOD, Assistant Prof., Dept. of ECE-cum Chairman, BOS)
4. Mrs. P. Patharia (Member BoS, Assistant Professor, Dept. of ECE)
5. Dr. P.S. Shrivastav (Invited Member, Assistant Professor, Dept. of ECE)
6. Mrs. B. Nath (Invited Member, Assistant Professor, Dept. of ECE)
7. Mr. Deepak K. Rathore (Invited Member, Assistant Professor, Dept. of ECE)
8. Mr. Shrawan K. Patel (Invited Member, Assistant Professor, Dept. of ECE)
9. Dr. Soma Das (Invited Member, Assistant Professor, Dept. of ECE)
10. Mr. Sumit Kumar Gupta (Invited Member, Assistant Professor, Dept. of ECE)

Following points were discussed during the meeting

1. CBCS based evaluation scheme of 5th and 6th semester was discussed and finalized.
2. Courses of 5th and 6th semester are discussed one by one and the changes have been incorporated as per the valuable suggestions of Expert member.

The following new courses were introduced in the of B. Tech. Third year (V and VI Semesters):

- LIC & Its Application (EC5TPC07)
- Communication System- II (EC5TPC08)
- Electromagnetic Field Theory (EC5TPC09)
- Microprocessor & Its Application (EC5TPE01)
- Data Structure & Operating System (EC5TPE02)
- Computer Architecture (EC5TOE11)
- OOP in C++ (EC5TOE12)
- Introduction to Information Security (EC5TOE13)
- Project Management (EC5TOE14)
- Rural Technology and Community Development (EC5TOE15)
- Digital Signal Processing (EC6TPC10)
- Antenna & wave prapogation (EC6TPC11)
- Data Communication & Computer Networking (EC6TPE03)

- Fundamental of VLSI Design (EC6TPE04)
- UNIX, Operating System (EC6T0E21)
- Probability & Stochastic Process (EC6T0E22)
- Advanced Instrumentation (EC6T0E23)
- Knowledge management (EC6T0E24)
- Engineering System Design Optimization (EC6T0E25)

विभागाध्यक्ष (इलें. एवं संचार अभियांत्रिकी)
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G. G. V. Bilaspur (C.G.)

Signature & Seal of HoD

Scheme and Syllabus

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

INSTITUTE OF TECHNOLOGY

GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR

SCHEME OF B.Tech. V^{rh} SEMESTER (CBCS)

ELECTRONICS & COMMUNICATION ENGINEERING

Vth SEMESTER

S. No :	Sub Code	Subject	Periods			Evaluation Scheme			Credit
			L	T	P	IA	ESE	Sub Total	
1.	EC5TPC07	LIC & its Application	3	1		40	60	100	4
2.	EC5TPC08	Communication System – II	3	1		40	60	100	4
3.	EC5TPC09	Electromagnetic Field Theory	3	1		40	60	100	4
4.	EC5TPE01	Microprocessor & Its Applications	3			40	60	100	3
5.	EC5TPE02	DS & OS	3			40	60	100	3
6.	EC5TOE11 - EC5TOE15	Open Elective	3			40	60	100	3
7.	EC5PPC07	LIC & its Application Lab			3	30	20	50	2
8.	EC5PPE01	Microprocessors & Its Applications Lab			3	30	20	50	2
9.	EC5PPC08	Communication System –II Lab			3	30	20	50	2
			18	3	9	330	420	750	27

L: Lecture, T: Tutorial, P: Practical, IA: Internal Assessment, MSE: Mid Semester Exam, ESE: End Semester Exam.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

V SEM. (Split up of Subject areas)

Sl No	Subject Area	Credits
1	PC	16
2	PE	8
	OE	3
Semester Credits		*27*

VI SEM. (Split up of Subject areas)

Sl No	Subject Area	Credits
1	PC	10
2	PE	8
3	OE	3
4	SEMINAR	2
Semester Credits		*23*

V SEMESTER B.Tech

S. No.	Subject Code	Subjects	Periods / Week			Total Credit
			L[1]	T[2]	P[3]	
1	EC5TPC07	LIC & ITS APPLICATION	3	1	0	4
2	EC5TPC08	CS-II	3	1	0	4
3	EC5TPC09	EMFT	3	1	0	4
4	EC5TPE01	Microprocessor & Its Application	3	0	0	3
5	EC5TPE02	DS&OS	3	0	0	3
6	EC5TOE11-EC5TOE15	1. Computer Architecture, 2.OOP in C++, 3.Introduction to Information Security, 4.Project Management, 5. Rural Technology and Community Development	3	0	0	3
PRACTICAL						
1	EC5PPC07	LIC & ITS APPLICATION	-	-	3	2
2	EC5PPE01	Microprocessor & Its Application	-	-	3	2
3	EC5PPC08	CS-II	-	-	3	2
				Total Credits		27

INSTITUTE OF TECHNOLOGY

GURU GHASIDAS CENTRAL UNIVERSITY BILASPUR

SCHEME OF B.Tech. VIth SEMESTER (CBCS)

ELECTRONICS & COMMUNICATION ENGINEERING

VIth SEMESTER

S. No:	Sub Code	Subject	Periods			Evaluation Scheme			Credit
			L	T	P	IA	ESE	Sub Total	
1.	EC6TPC10	Digital Signal Processing	3	1		40	60	100	4
2.	EC6TPC11	Antenna & Wave Propagation	3	1		40	60	100	4
3.	EC6TPE03	Data Communication & Computer Networking	3			40	60	100	3
4.	EC6TPE04	Fundamental of VLSI Design	3			40	60	100	3
5.	EC6TOE21 - 25	Open Elective	3			40	60	100	3
6.	EC6PPE02	VHDL Lab			3	30	20	50	2
7.	EC6PPC06	Digital Signal Processing Lab			3	30	20	50	2
8.	EC6PSP01	Seminar				30	20	50	2
			15	2	6	290	360	650	23

L: Lecture, T: Tutorial, P: Practical, IA: Internal Assessment, MSE: Mid Semester Exam, ESE: End Semester Exam.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

VI SEMESTER B.Tech						
S. No.	Subject Code	Subjects	Periods / Week			Total Credit
			L[1]	**T[2]**	**P[3]**	
1	**EC6TPC10**	DSP	3	1	0	4
2	**EC6TPC11**	Antenna & wave prapogation	3	1	0	4
3	**EC6TPE03**	Data Communication & Computer Networking	3	0	0	3
4	**EC6TPE04**	Fundamental of VLSI Design	3	0	0	3
5	**EC6TOE21-25**	1.UNIX, Operating System 2. Probability & Stochastic tProcess 3. Advanced Instrumentation, 4. Knowledge management, 5. Engineering System Design Optimization,	3	0	0	3
PRACTICAL						
1	**EC6PPE02**	VHDL	-	-	3	2
2	**EC6PPC06**	DSP	-	-	3	2
3	**EC6PSP01**	SEMINAR				2
				Total credit		**23**

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TPC07	3	1		3 hours	40	60	4

Course Objective

1. To understand the concepts, working principles and key applications of linear integrated circuits.
2. To perform analysis of circuits based on linear integrated circuits
3. To design circuits and systems for particular applications using linear integrated circuits.

LIC & ITS APPLICATIONS

UNIT – I

Basic Building Blocks for ICs & OPAMP: Basic Differential Amplifiers & Analysis, Introduction to OPAMP, Ideal OPAMP Characteristics, OPAMP ICs:741Pin Diagram and Pin Function, Inverting Amplifier, Non-Inverting Amplifier, Definition of OPAMP Parameters, Frequency Response of OPAMP, Open Loop & Closed Loop Configuration of OPAMP and its Comparisons, Voltage Comparator, Zero Crossing Detector, Level Detector.

UNIT – II

Applications of OPAMP: Introduction, Adder, Substractor/Difference Amplifier, Voltage Follower, Integrator, Differentiator, Comparator IC such as LM339, Window detector, Current to Voltage and Voltage to Current Converter, Instrumentation Amplifier, Precision Half Wave Rectifier, Precision Full Wave Rectifier, Log & antilog amplifier, Schmitt Trigger, Bridge Amplifier, Peak Detectors/Peak follower, Sample-and- Hold Amplifiers, Square wave generator, Saw-tooth wave generator, Triangular wave generator, Astable multivibrator, Monostable multivibrator, Dead Zone circuit- with positive output, with negative output, Precision clipper circuit, Generalized Impedance Converter (GIC) and its application.

Frequency response of OPAMP: Open loop voltage gain as a function of frequency, Unity gain Bandwidth, Close loop frequency response, Slew Rate.

UNIT – III

Active filters & PLL - Introduction to Filters, Merits & Demerits of active filters of over Passive Filter, Classification of filters, Response characteristics of Filter, First Order and Second Order active high pass, Low pass, Band pass and band reject Butterworth filters.

Phase Lock Loop: Operating Principle of the PLL, Linear Model of Phase Lock Loop, Lock Range and Capture Range, Application of the PLL. Voltage Controlled Oscillator(VCO).

UNIT – IV

D/A and A/D converters & Analog Multiplier: D/A converter - Ladder, R-2R, A/D converters- Ramp, Continuous conversion, Flash ADC, Dual slope ADC, Successive Approximation, Voltage to Time converters. Timing and circuits comparisons, DAC/ADC specifications.

Analog Multiplier: Basic Analog Multiplication Techniques, Applications of Multiplier- Frequency doubling, Phase-angle difference detection, Voltage dividing action, Square root of a signal, Function realization by Multiplier, Amplitude Modulator, Standard Modulator Circuit, Demodulation of AM signal.

UNIT – V

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TPC08	3	1		3 hours	40	60	4

Course Objectives:

- To understand the key modules of digital communication systems with emphasis on digital modulation techniques.
- To get introduced to the concept and basics of information theory and the basics of source and channel coding/decoding.

COMMUNICATION SYSTEM – II

UNIT – I

Pulse Modulation: Sampling theorem, Basic principles of PAM, PWM and PPM, TDM, comparison of TDM with FDM; Typical multiplexed systems.

Pulse Code Modulation: Pulse code modulation, generation and detection of PCM, quantization, companding, A-Law and μ-Law, differential PCM; Delta modulation, Adaptive delta modulation.

UNIT – II

Digital Modulation Techniques: Introduction – Pass band Transmission model- Generation, Detection of BPSK, DPSK, DEPSK, QPSK, M-Ary PSK, QASK, BFSK, MSK, Duo- Binary Encoding, QAM.

UNIT – III

Optimal reception of digital signal: Performance of Digital Modulation Systems, S/N ratio of PCM and DM, Comparison of PCM and DM. pulse shaping of baseband signal, Equalization principles, ISI, Optimum Filter, Matched Filter, Error Probability of Various digital modulation Technique.

UNIT – IV

Information Theory: The concept of Information, average information, Entropy; Marginal, Conditional and Joint Entropies, Information rate , Shannon's theorm, Channel capacity, Bandwidth S/N tradeoff, Discrete communication channels, Shannon's limit, mutual information and channel capacity, Continuous communication channels, Channel with finite memory, Discrete memory less channels.

UNIT – V

Coding: General principles of coding, necessary and sufficient condition for noiseless coding, Coding efficiency, Shannon-Fano and Huffman coding; Error control, Hamming codes, Linear block codes, Cyclic codes, Convolutional codes - Viterbi Algorithm, Trellis coded Modulation.

SUGGESTED BOOKS & REFERENCE:-

1. Principles of Communication Systems –Taub and Shilling, Tata Mc Graw Hill.
2. Communication Systems –Simon Haykins. Tata McGraw Hill
3. Principles of Digital Communication Systems, B.P. Lathi, PHI
4. Principles of Digital Communications, Das, Mullick and Chatterjee, Wiley Eastern Publications.
5.Digital and Analog Communication Systems: K.Sam Shanmugam, John Wiley
6. Microelectronic Circuits: Sedra and Smith 6th edition, Oxford University Press.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TPC09	3	1		3 hours	40	60	4

Course objective

1. To acquire the knowledge of Electromagnetic field theory that allows the student to have a solid theoretical foundation to be able in the future to design emission, propagation and reception of electro- magnetic wave systems
2. To identify, formulate and solve fields and electromagnetic waves propagation problems in a multidisciplinary frame individually.
3. To provide the students with a solid foundation in engineering fundamentals required to solve problems and also to pursue higher studies

ELECTROMAGNETIC FIELD THEORY

UNIT-I

INTRODUCTION: Review of vector analysis, Scalar & vector products, Coordinate systems and Transformation amongst rectangular, cylindrical and spherical co-ordinate system, Line, Surface and Volume Integral, Gradient of a Scalar, Divergent and Curl of a vector, Divergence Theorem, Stoke´s Theorem, Laplacian of a Scalar.

UNIT-II

Electrostatics: Coulomb's law, electric field intensity from point charges, field due to continuous distribution of charges, Electric Flux density, Gauss's law, Electric displacement and displacement density, Electric Potential, Potential field of a point charge, Laplace and Poison's equation.

Magnetostatics: Biot-Savart´s law, Ampere's circuital law and its Application, Magnetic flux density, Magnetic Scalar and Vector potential, Magnetic Energy stored.

UNIT-III

Time Dependent Field: Ampere's work law in differential work form, continuity of currents, Conduction and displacement currents, Maxwell's equation and their interpretations, Boundary conditions.

Energy Flow And Poynting Vector: Pointing theorem, interpretation of ExH.Simple application, complex pointing vector.

UNIT-IV

Wave equations, Sinusoidal time varying fields, uniform plane wave in dielectric and conductor media, Skin effect and depth of penetration, Reflection and refraction of plane waves at boundaries for normal and oblique incidence surface impedence.

UNIT-V

Transmission Lines: Transmission line theory from the circuit concept, Properties, Constants, Transmission line equations, Infinite line, Reflections in Transmission lines, Voltage Current and Impedance relations- Open and short circuit lines, Experimental determination of line constants, Standing wave ratio, Impedance matching, Quarter and half wave lines, Single stub and double stub matching, Circle diagram, Smith chart.

SUGGESTED BOOKS & REFERENCE:-

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TPE01	3	0		3 hours	40	60	3

Course Objective

1. Introduce the concept of microprocessor and its history and evolution with integration technology.
2. Introduce the concept of interfacing and also assembly language programming in 8085 and 8086.
3. Introduce the concept of architecture of microprocessor.

MICROPROCESSOR & ITS APPLICATION

UNIT – I

Microprocessor architecture and Microcomputer systems: History And Evolution, Types Of Microprocessors, Functions of Microprocessor, Architecture of 8085, Pin configuration and Function, Tristate Bus concept, Generation of Timing Signals, Bus Timing, Demultiplexing, Instruction execution, Instruction cycle, Machine cycles, T states, Fetch executes cycle, Instruction Timing and Operation status.

UNIT – II

Memory map & addresses, I/P devices ,I/P Addressing, The 8085 Programming model, Instruction Classification, Instruction & Data Formats, Addressing Modes, Instruction for data transfer, Arithmetic and Logical operation, Branching operation, Addressing mode, Writing Assembly Language Programs.

Counters, Time Delays And interrupts: Memory interfacing, Absolute, Partial Decoding, Multiple Address Range, Interfacing memory with wait states, Interfacing I/O devices, Peripheral I/O, Memory Mapped I/O, 8085 Single Board Microcomputer System. Interfacing Of 8085 with 8155/8156(RAM), 8355/8755(ROM).

UNIT – III

Programming Techniques with additional instructions, Looping, counting and indexing, Data transfer from/to memory to/from microprocessor, 16-bit arithmetic instructions, Logic Operations like rotate, compare, Time delays, Counters, Stacks, Subroutine, Call and return instructions. Interrupts, The 8085 interrupt process, multiple interrupt and priorities, Vectored interrupts. Restart as software instruction.

UNIT – IV

Programmable Interfacing devices: Basic Concept, 8279 programmable Keyboard/Display interface,8255A Programmable Parallel interface, Interfacing keyboard and display using 8255A, 8254 Programmable Interval Timer, 8259A Programmable Interrupt Controller, Direct Memory Access(DMA), 8237 DMA Controller. Basic Concept in Serial I/O, Data Communication over Telephone Lines, 8085-serial I/O lines, 8251A Programmable Communication interface, Interfacing a matrix keyboard, Interfacing LED and seven segment displays.

UNIT –V

Introduction of 16-bit Microprocessor: Internal organization of 8086, Signal descriptions, Physical memory organization, Minimum & Maximum mode, Bus Organization and timing. Addressing modes, Instruction set, Assembler directives, Interrupts and Interrupt service routine.

SUGGESTED BOOKS & REFERENCE:-

1. *"Microprocessor Architecture, Programming & Applications with the 8085",R.S.Gaonkar, Penram Publication.*
2. *"Advance Microprocessor & Peripherals", A K Rai , K M Bhurchandi, TMH*
3. *"The Intel Microprocessor", Barray B. Brey, PHI*

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TPE02	3	0		3 hours	40	60	3

Course Objective:

1. To introduce the concept of Data Structure.
2. To introduce operating system as a resource manager, its evolutions and fundamentals.
3. To help student understand concept of process and different process (linear and concurrent) Scheduling policies.
4. To help student familiar with memory, file and I/O management policies.

DATA STRUCTURE & OPERATING SYSTEM

UNIT – I

Data structure: Introduction, classification, operations, algorithm analysis.
Array: insertion, deletion, searching, sorting. Dynamic memory allocation.

UNIT - II

Linked List: Singly, Doubly and their operations, **Stack:** Basic Operation, Conversion of infix notation using
stack, evaluation of postfix expression, recursion, **Queue:** Basic Operation, Circular & Linear Queue.

UNIT - III

Tree: Introduction, binary tree traversal, binary search tree and their operations.
Graph: Representation of graph, shortest path, graph traversal, spanning tree, minimum spanning tree.

UNIT - IV

Operating System Overview: Operating system objectives and functions, evolution of operating system, System calls.
Process Management: Process concepts, CPU scheduling, Deadlocks, Deadlock detection, prevention and recovery.

UNIT - V

Memory Management: Swapping, Contiguous allocation, Paging, Segmentation, Virtual memory, Demand paging, Page replacement policies, Thrashing.
Disk Management: Free space management, Disk management, Disk scheduling.

SUGGESTED BOOKS & REFERENCE:-

1. *Data Structures, Seymour Lipschutz, Schaum's Series, Tata McGraw Hill Publication.*
2. *Operating System, Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Tata McGraw Hill Publication.*
3. *Data Structure Using C, Aaron M. Tanenbaum, Pearson Publication.*
4. *Operating Systems, William Stallings, Pearson Education.*

Subject outcomes:

1) To Learn linear data structures – lists, stacks, and queues
2) To understand sorting, searching and different algorithms
3) To apply Tree and Graph structures

And also familiar with the operating system and memory concept and process management.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TOE11	3	0		3 hours	40	60	3

Course Objective

1.Discuss the basic concepts and structure of computers
2. Understand concepts of register transfer logic and arithmetic operation
3. Explain different types of addressing modes and memory organization.
4. Learn the concept of pipeline architecture.
5. Summarize the Instruction execution stages.

COMPUTER ARCHITECTURE

UNIT-I

Basic of Computer Organization & Architecture: Introduction, Computer Organization vs. Computer architecture, Von Neumann Architecture vs. Harvard Architecture, Introduction to Simple as Possible (SAP) Computer Architecture.

Input & Output Organization: Introduction, Simple Bus Architecture, Types of Buses, I/O Communication Methodologies: Programmed I/O (Polling), Interrupt-driven I/O &Direct Memory Access (DMA), I/O channel & I/O Processor, Accessing I/O device: Memory Mapped I/O, Isolated or I/O Mapped.

UNIT-II

Computer Arithmetic: Introduction, Addition & Subtraction: Addition & Subtraction with Signed-Magnitude Data, Hardware Implementation & Algorithm, Addition & Subtraction with Signed-2's Complement Data, Multiplication Algorithm: Hardware Implementation for Signed-Magnitude Data, Hardware Algorithm, Booth Multiplication Algorithm, Array Multiplier, Division Algorithms: Hardware Implementation for Signed-Magnitude Data& Algorithm , Carry Look Ahead Adder.

UNIT-III

Memory Organization: Introduction, Types of Memory, Memory Hierarchy, Main Memory, Cache Memory, Virtual Memory, Associative Memory.

Processor Organization: Introduction, Control Unit: Hardwired Control Unit, Micro programmed Control Unit, Instruction Set Computer: Reduced Instruction Set Computer (RISC) vs. Complex Instruction Set Computer (CISC).

UNIT-IV

Pipelining: Introduction, Concept of Instruction Pipeline, Design Problems with Pipeline: Structural Hazard, Data Hazard & Control Hazard, Extension in Pipeline Designed: Super Pipelining, Superscalar Processor, Very Long Instruction Width (VLIW) Architecture.

UNIT-V

Multiprocessor System: Introduction, Shared Memory Multiprocessor, Distributed Memory Multiprocessor, Flynn's Classification: Single Instruction Single Data (SISD), Single Instruction Multiple Data (SIMD), Multiple Instruction Single Data (MISD), Multiple Instruction Multiple Data (MIMD), Cache Coherence, Message Passing Model, Cluster Computing, Distributed Computing.

SUGGESTED BOOKS & REFERENCE:-

1. *Computer System Architecture, M. Morris Mano, Pearson Education India.*
2. *Computer Organization & Architecture, W. Stalling, Pearson Education India.*

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TOE12	3	0		3 hours	40	60	3

Course Objective

1. To learn advanced features of the C++ programming language as a continuation of the previous course.
2. To learn the characteristics of an object-oriented programming language: data abstraction and information hiding, inheritance, and dynamic binding of the messages to the methods.
3. To learn the basic principles of object-oriented design and software engineering in terms of software reuse and managing complexity.
4. To enhance problem solving and programming skills in C++ with extensive programming projects.

OBJECT ORIENTED PROGRAMMING IN C++

UNIT I

Principles of OOP –A look at procedure oriented programming, OOP paradigm, Basic Concepts of OOPs, Benefits of OOP, object oriented Language. Beginning with C^{++} characters used in C^{++} · Basic Data Types , C^{++} Tokens, Identifiers , Keywords , Constants , Variables , Input / Output statements ,Structure of C^{++} program.

UNIT II

Operations and Expressions - Concept, Arithmetic Operations and Expressions, Relational and Logical operators and Expressions ,Order of evaluation of expressions ,Type conversion , Compound assignment Operator ,Standard Library Functions and header files. Flow of control – Compound statement , sequential structure ,selection structure ,simple if ,if … else nested if , ladder ,switch , go to , loop structure , do … while ,for , statement break , continue , function exit ( )

UNIT III

Array and Function - Concept of array, Concept of subprogram, Parameter passing in function, Function prototype, Calling function, Call by value, Call by reference, Array parameters, Default argument, Returning values, Scope rules, Storage class, Inline function, Function overloading, Recursive functions. Structure, Class and Object - Define structure, Returning structure elements, Nested structure, Passing structure to function, User defined data type, Specifying a class, Defining member function, Scope of class and its member, Nested class, Data Hiding and encapsulation, Friend function, Object as function argument, Function returning object, Static member.

UNIT IV

Constructors, Destructors, constructor function, parameterized multiple constructor, Default constructor, Copy constructor and Destructor function. Inheritance and aggregation - Derived class, various type of inheritance, Inheriting Constructors, Parts explosion as aggregation, Abstraction and property of aggregation, Constructing aggregations. Polymorphism, overloading and operator overloading.

UNIT V

Pointer and virtual function - Pointer variable, dynamic allocation operators, new and delete, this operator Pointers to derived class, Working with files - File & stream, Opening and closing a file, read( ) and write( ) functions, detecting end of file.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TOE13	3	0		3 hours	40	60	3

Course Objective

This course focuses on the models, tools, and techniques for enforcement of information security with some emphasis on the use of cryptography. Students will learn information security from multiple perspectives

INTRODUCTION TO INFORMATION SECURITY

UNIT I

Introduction to security attacks, Services & Mechanism, Introduction to Cryptography, Conventional encryption, Classical encryption techniques- Substituion and Transposition ciphers, Cryptanalysis, Stegnography. Simplified DES ,Block cipher principles, The data encryption standard, the strength of DEC, Differential and linear Cryptanalysis, Block cipher design principles, Block cipher modes of operation, evaluation criteria for AES, The AES cipher, Triple DES, blowfish

UNIT II

Principle of public key cryptosystem, Public key cryptosystems, Application for public key cryptosystem, requirement for public key cryptography, public key crypto analysis, The RSA algorithm, computational aspects ,The security of RSA, Key managements, Distribution of public key, public key distribution of secret keys, s security requirements for signature scheme.

UNIT III

Elliptic curves cryptography message, authentication and hash function, authentication requirement, authentication functions, message authentication code security of hash function, Hash and Mac algorithm, MDS message digest algorithm, secure hash algorithm(SHA-l).

UNIT IV

Authentication applications – Kerberos – X.509 authentication service – Electronic mail security – PGP – S/MIME – IP security – Web security.

UNIT V

Intruders:-Intrusion techniques, Intrusion detection, Honey pots, firewall design principles, firewall characteristics, Type of firewall, fire wall configurations.

Web security:-Web security threats, web traffic security approaches, SSL architecture, SSL record protocol, change cipher spec protocol, Alert protocol, Handshake Protocol, Cryptographic Computations, Transport layer security, Secure Electronic Transaction.

SUGGESTED BOOKS & REFERENCE:

1. *Cryptography and Network Security, Principles and Practice, William Stallings, PHI*
2. *Cryptography Theory and Practice, Douglas R. Stinso, Champan & hall/CRC*
3. *Applied Cryptography, Bruce Schiener, John Wiley & Sons.*
4. *Network Security & Cryptography, Bernard Menezes, Cengage Learning.*
5. *Introduction to Cryptography, Johannes A Buchmann, Springer-Verlag.*
6. *Network Security: Private Communication in public world, Charlie Kaufman, R Perlman, M Speciner, Prentice Hall.*

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC5TOE14	3	0		3 hours	40	60	3

Course Objective

1. To make them understand the concepts of Project Management for planning to execution of projects.
2. To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation.
3. To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting.
4. Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies .

PROJECT MANAGEMENT

UNIT-I, ***Basics of Project Management:*** Introduction, Characteristics of projects, Definition and objectives of Project Management, Stages of Project Management, Project Management Processes, Project Management Principles

UNIT-II, ***Project Identification and Selection:*** Introduction, Project Identification Process, Project Initiation, Pre-Feasibility Study, Feasibility Studies, Project Break-even point

Project Planning: Introduction, Project Planning, Need of Project Planning, Project Life Cycle, Roles, Responsibility and Team Work, Project Planning Process, Work Breakdown Structure (WBS)

UNIT-III, ***Resources Considerations in Projects:*** Introduction, Resource Allocation, Scheduling, Project Cost Estimate and Budgets, Cost Forecasts

PERT and CPM: Introduction, Development of Project Network, Time Estimation, Determination of the Critical Path, PERT Model, Measures of variability, CPM Model, Network Cost System

UNIT-IV, ***Project Management Information System:*** Introduction, Project Management Information System (PMIS), Planning of PMIS, Design of PMIS

Project Management Software: Introduction, Advantages of Using Project Management Software, Common Features Available In Most of the Project Management Software.

UNIT-V, ***Post-Project Analysis:*** Project review and control- Initial review, performance evaluation, abandonment analysis and its behavioral issues.

SUGGESTED BOOKS & REFERENCE:-

1. Shtub, Bard and Globerson, Project Management: Engineering, Technology, and Implementation, PHI
2. Lock, Gower, Project Management Handbook.
3. Cleland and King, VNR Project Management Handbook.
4. Wiest and Levy, Management guide to PERT/CPM, Prentice Hall. Ibdia
5. Horald Kerzner, Project Management: A Systemic Approach to Planning, Scheduling and Controlling, CBS Publishers, 2002.
6. S. Choudhury, Project Scheduling and Monitoring in Practice.
7. P. K. Joy, Total Project Management: The Indian Context, Macmillan India Ltd.
8. Project planning, analysis, selection, implementation and review by Prasanna Chandra, TMH.

Course Objective:

Objective of this subject is to introduce the concept of Rural development and community development in aspect of technology.

RURAL TECHNOLOGY AND COMMUNITY DEVELOPMENT

Unit- 1: PMGDISHA, digital literacy program, role of electronics in cashless rural economy, constraint in digitalization of rural areas, problems in community networking.

Unit- 2: Data, Information and Knowledge; concept of information, need of information (professional, educational, research), qualities of information, value of information, difference between data and information, properties of the needed information. Information and Management; planning, organizing, co-ordinating and controlling,

Unit- 3: Concepts of rural marketing; difference between rural and urban marketing, selling and retailing; marketing mix, market-segmentation, marketing planning, Strategy and Approaches; modern concept of marketing.

Unit- 4: Community development; concept, definition, meaning, need, history, principles, objectives and scope. Critical analysis of different rural development program organized by government of INDIA. PRA and RRA for problem analysis of villages .

Unit-5: Strategies for enhancing rural infrastructures. The Role of various NGOs in Community Development. Community Development Initiatives.

SUGGESTED BOOKS & REFERENCE: -

1. *Biddle, William Wishart. 1968. Encouraging Community Development: A Training Guide for Local Workers. New York: Holt, Rinehart and Winston.*

2. Kramer, Ralph M. and Harry Specht. 1975. Readings in Community Organization Practice. 2d ed. Englewood Cliffs, NJ: Prentice-Hall.

3. Sustainable Rural Technology, by M.S. Virdi, Daya Publishing House, ISBN: 8170355656

4. Rural Education and Technology, by S B Verma S K Jiloka Kannaki Das, Publisher: Deep & Deep Publications Pvt. Ltd. (2006)

5. Participatory Rural Appraisal. By Neela Mukharjee, Concept Publisher New Delhi.

6. India's developing villages. By G.R. Madan, Kalyani Publication, New Delhi.

ELECTRONICS & COMMUNICATION ENGINEERING — Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TPC10	3	1		3 hours	40	60	4

Course objective

The primary objective of this course is to provide a thorough understanding and working knowledge of design, implementation and analysis of DSP systems.

DIGITAL SIGNAL PROCESSING

UNIT – I

Realization of Systems: Realization of digital linear system, Signal flow graph. Structures for realization of discrete time systems, Structures for IIR and FIR systems, State space system analysis and structures, Representation of numbers, Quantization of filter coefficients, Round off effects in digital filters, Introduction to digital signal processors.

UNIT – II

Infinite Impulse Response Filter design (IIR): Features of IIR filters, Design stages, Filter design by Approximation of Derivatives, Impulse invariance method, Bilinear transformation method, Butterworth and Chebyshev Design Method, Frequency Transformations in Analog and Digital domain. .

UNIT – III

Finite Impulse Response (FIR) Filter Design: Linear phase response- Symmetric and Antisymmetric, Design by Window method, Optimal method, Rectangular, Triangular, Hamming, Blackman & Kaiser Window, Frequency sampling method, Design of FIR differentiators, Design of Hilbert transformer, Comparison of various design methods.

UNIT – IV

Multirate DSP: Introduction, Sampling Rate Conversion by rational factor, Decimation of Sampling rate by an Integer factor, Interpolation of sampling rate by an Integer Factor, Sampling rate alteration or conversion by a rational factor. Simple Structures of decimator and interpolator. Applications of Multirate Digital Signal Processing (MDSP).

UNIT – V

Applications of Digital Signal Processing: Introduction, Applications of DSP: Digital Sinusoidal Oscillators, Digital Time Control Circuits, Digital Comb Filters. Applications in broader sense: Removal of noise from pictures, Applications of DSP to Radar, Applications of DSP in Image Processing, Applications of DSP in speech processing.

SUGGESTED BOOKS & REFERENCE:-

1. *"Digital Signal Processing", J. Johnson, Pearson - PHI*
2. *"Digital Signal Processing", Proakis, Manolakis & Sharma, Pearson Education*
3. *"Digital Signal Processing", Nair, PHI*
4. *"Discrete Time Signal Processing", Oppenheim & Schafer, Pearson – PHI*

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TPC11	3	1		3 hours	40	60	4

Course Objective:

The main objective of the course of determination of the fields radiated from antennas; wire antennas; array antennas; parabolic reflectors; antenna radiation pattern; antenna directivity; effects of the lossy ground on the wave propagation.

ANTENNA AND WAVE PROPAGATION

UNIT – I

Fundamental Parameters of Antenna: Introduction, Radiation Pattern, Radiation Power Density, Beam- width, Directivity, Antenna Efficiency, Gain, Bandwidth, Polarization, Antenna Radiation Efficiency, Friss Transmission Equation.

UNIT – II

Electromagnetic Radiation: Short electric dipole, Half wave dipole, Radiation from a small current element, power radiated, Radiation from a half wave dipole, Power radiated, Radiation resistance, Isotropic radiators and radiation pattern, Effective length, Antenna top loading and tuning effect of earth.

UNIT – III

Antenna Arrays and Their Design: Broadside and End fired arrays Collinear array, Array of point source, Non isotropic but similar point sources, Pattern Multiplication, Linear array with n Isotropic point sources of equal amplitude and spacing, Binomial, Dolph Tchebyscheff arrays.

UNIT – IV

Practical Antennas: Resonant and Non resonant antennas, Tower radiator, Long wire antenna, V antenna, Rhombic antenna, Loop antenna, Folded Dipole Antenna, Yagi -Uda Antenna, Reflector Antenna, Helical Antenna, Turnstile Antenna, Babinet's Principle, Horn Antenna, Micro-strip Antenna, Dielectric Resonator Antenna, Smart Antenna

UNIT – V

Wave Propagation : Modes of propagation of EM waves, UHF and Microwave Propagation, sky wave, Surface wave, Space wave range and fields calculations, Ionosphere characteristics, Earth's magnetic field, Ionospheric propagation, Refractive index at high frequencies, Mechanism of radio wave bending, critical frequency, Effect of earth's magnetic fields, Effective dielectric constant and conductivity, MUF, Skip distance, Optimum working frequency, Multi hop propagation, Ionosphere abnormalities, Troposheric propagation, Effect of earth's curvature and dielectric constant, Tropospheric scatter and Duct propagation.

SUGGESTED BOOKS & REFERENCE:-

ELECTRONICS & COMMUNICATION ENGINEERING — Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TPE03	3	0		3 hours	40	60	3

Course objective

1. To introduce analysis and design concept of computer and communication networks.
2. To understand the network layered architecture and the protocol stack.

DATA COMMUNICATION AND COMPUTER NETWORKING

UNIT- I

Model of digital communication system, OSI Reference, TCP/IP, ATM Reference Model, Characteristics of signals, basic concepts, Analog and digital transmission, parallel and serial transmission, Multi formats, T1, E1, SONET, SDH, QC, Asynchronous and Synchronous transmission, simplex, half duplex and duplex, different guided and unguided media, Wireless & Mobile, channel capacity.

UNIT-II

Review of different types of Encoding.

MAC Protocols, Network topologies, error detection techniques like parity check, LRC and CRC (Cyclic Redundancy Check) Implementations using shift register method. Interfacing standard: RS232, RS423A, Data link control, Flow control using stop and wait ,DRQ, go back to N ARQ and selective Reject ARC, Data link Control protocol :DLC,SDLC.

UNIT- III

Circuit Switching, Circuit Switched Networks, Switching concept, space, division switching. Time division switching, Packet Switching, principle. Switching techniques, Comparison with circuit switching, Routing and congestion control algorithm. Application of spread spectrum.

UNIT- IV

Layered network model, OSI layer standard, medium access control, Network protocol, internet working, TCP-IP, IPV-4, IPV-6, Ethernet, ISDN, B-ISDN, ATM, binary synchronous character in BSC frame.

UNIT- V

Application Layer: DNS, Telnet, TFP, SMTP, World Wide Web, HTML, URL, HTTP. IEEE-802.2 LLC, IEEE 802.3 Ethernet, IEEE 802.5 MAC Frame format, IEEE 802.11 Wireless Local Area Network: Layered Architecture, DCF, PCF, MAC Frame of IEEE 802.11, Physical layer of IEEE 802.11.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TPE04	3	0		3 hours	40	60	3

Subject Objective

1.To understand the fabrication process of CMOS technology
2. To teach fundamentals of VLSI circuit design and implementation using circuit simulators and layout editors.
3. To study various problems due to VLSI technology advancement.
4. To study digital circuits using various logic methods and their limitations.
5. To highlight the circuit design issues in the context of VLSI technology.

Fundamental of VLSI Design

UNIT I

Evolution of VLSI, VLSI Design Methodology, VLSI Design Flow, Full Custom & Semicustom Design Approach, FPGA Design, CAD Technology, MOS structure, MOS system under external bias condition, Structure and operation of MOSFET, N-MOS and P-MOS technology, Accumulation, Depletion, Inversion, I-V characteristics, Threshold voltage, Body Effect, MOSFET Capacitance, Latch-up , Second order Effects.

UNIT II

CMOS Fabrication process flow, CMOS N-well process, Layout design rules, stick diagram, CMOS design rules, Diagram for N-MOS and CMOS inverter & Gates, P-well process, Twin-Tub process, Fabrication of bipolar Transistor.

UNIT III

MOS Inverter static characteristics, CMOS inverter, Voltage transfer characteristics, Noise margin, CMOS inverter circuit operation, Switching characteristics, Delay time definitions, Power dissipation- static and dynamic power, BiCMOS Inverter.

UNIT IV

Combinational MOS logic circuit, CMOS logic circuits, Complex logic circuit, CMOS Transmission Gate, Pseudo NMOS logic, Sequential MOS logic circuits, Latches and Flip Flop circuits.
Dynamic CMOS logic circuits, Domino CMOS logic, NORA, ZIPPER logic

UNIT V

Introduction to VHDL, EDA tools, Entity and Architecture declaration, Data Objects, Data Types, Operators, Concurrent and Sequential Statements, Various Architecture Styles of Modeling, Design of Combinational and Sequential Circuits.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TOE21	3	0		3 hours	40	60	3

Course outcomes:

Objective of this subject to familiarizes the students with concept, design and structure of UNIX operating system and also learn the file management.

UNIX Operating System

UNIT-I
The Operating System, The UNIX Operating System, Knowing Your Machine, A Brief Session [Logging in with Username and Password, The Command, Displaying Both Date and Time, Clearing the Screen, The Calendar, Viewing Processes, Listing Files, Directing Output to a File, Counting Number of Lines in a File].

UNIT-II
The UNIX Architecture [Division of Labor : Kernel and Shell, The File and Process, The System Calls], Features of UNIX [Multiuser System, Multitasking System, Building Block Approach, UNIX Toolkit, Pattern Matching, Programming Facility, Documentation], Locating Commands [The PATH], Internal and External Commands, Command Structure [Options, Filename Arguments, Exceptions], Flexibility of Usage, Browsing the Manual Pages [man].

UNIT-III
General Purpose Utilities [The Calendar, Displaying The System Date, Displaying A Message, An Alternative To Echo, The Calculator, Recording Your Session, Email Basics, The Universal Mailer, Changing Your Password, Who, Uname, Tty, Stty, Changing The Settings]

UNIT-IV
The File [Ordinary, Directory, Device], The Parent Child Relationship, The Home Directory, Checking Your Current Directory, Changing The Current Directory, Making Directories, Removing Directories, Absolute Path Names, Relative Pathnames, Listing Directory Contents.

UNIT-V
Displaying And Creating Files, Copying A File, Deleting Files, Renaming Files, Paging Output, Printing A File, Knowing The File Types, Counting Lines/Words/Characters, Displaying Data In Octal, Comparing Two Files, Comm, Converting One File To Other, Compressing And Archiving Files, Compressing And Decompressing Files

SUGGESTED BOOKS & REFERENCE:-

1. *S. Das, UNIX CONCEPTS AND APPLICATIONS, TMH.*
2. *H. Hahn, HARLEY HAHN'S STUDENT GUIDE TO UNIX, McGraw Hill Companies.*
3. *S.M. Sarwar, R. Korektsy AND S.A. Sarwar, UNIX : THE TEXTBOOK, Addison-Wesley Longman.*

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TOE22	3	0		3 hours	40	60	3

Course Objective

The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications in engineering and science like disease modeling, climate prediction and computer networks etc.

Probability & STOCHASTIC PROCESS

UNIT-I

Probability Theory Refresher: Axiomatic construction of probability spaces, random variables and vectors, probability distributions, functions of random variables; mathematical expectations, transforms and generating functions, modes of convergence of sequences of random variables, laws of large numbers, central limit theorem.

UNIT-II

Introduction to Stochastic Processes (SPs): Definition and examples of SPs, classification of random processes according to state space and parameter space, types of SPs, elementary problems.

UNIT-III

Discrete-time Markov Chains (MCs): Definition and examples of MCs, transition probability matrix, Chapman-Kolmogorov equations; calculation of n-step transition probabilities, limiting probabilities, classification of states, ergodicity, stationary distribution, transient MC; random walk and gambler's ruin problem, applications.

Continuous-time Markov Chains (MCs): Kolmogorov-Feller differential equations, infinitesimal generator, Poisson process, birth-death process, Applications to queueing theory, inventory analysis, communication networks, finance and biology.

Brownian Motion: Wiener process as a limit of random walk; first -passage time and other problems, applications to finance.

UNIT-IV

Branching Processes: Definition and examples branching processes, probability generating function, mean and variance, Galton-Watson branching process, probability of extinction. Renewal Processes: Renewal function and its properties, elementary and key renewal theorems, cost/rewards associated with renewals, Markov renewal and regenerative processes, applications.

Stationary Processes: Weakly stationary and strongly stationary processes, moving average and auto regressive processes.

ELECTRONICS & COMMUNICATION ENGINEERING — Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TOE23	3	0		3 hours	40	60	3

Course objective

1 .To familiarizes the student with general concept of instrumentation and measurement.
2. To introduce the concept of Temperature and flow measurement.

ADVANCED INSTRUMENTATION

UNIT – I

Generalized Performance Characteristics of Instruments-I: Static Characteristics and static calibration, Measured Value and True Value, Some Basic Statistics, Least Square calibration Curves, 2-σ limits in defining imprecision, Chi-square test, Calibration Accuracy and Installed accuracy, Static sensitivity, Linearity, Threshold, Noise Floor, Resolution, Hysteresis, Dead Space, Span, Loading Effect.

UNIT – II

Generalized Performance Characteristics of Instruments-II: Dynamic Characteristics, Generalized model of measurement system, Digital simulation method, Operational Transfer Function, Sinusoidal Transfer Function, Zero order instrument.

UNIT – III

Generalized Performance Characteristics of Instruments-III: 1st order instrument - Step Response, Frequency Response, Impulse Response, 2nd order instruments - Step Response, Frequency Response, Impulse Response, Loading effect under dynamic conditions.

UNIT – IV

Temperature Measurement: Thermal Expansion Method, Thermo-electric Sensors, Electrical Resistance Sensors, Junction Semiconductor Sensors, Digital Thermometers, Radiation Methods.

UNIT – V

Flow Measurement: Flow visualization, Pitot-Static Tube, Dynamic Wind-Vector Indicator, Hot-Wire and Hot-Film Anemometers, Hot-Film Shock-Tube Velocity Sensor.

SUGGESTED BOOKS & REFERENCE:-

1.Measurement Systems, Ernest O Doebelin & Dhanesh N Manik, Mc Graw Hill publication
2.Electronic Instrumentation, 3edition by H. S. Kalsi Tata Mc Graw Hill publication
3. A Course in Electronic Measurements and Instrumentation, A.K.Sahani, Dhanpat Rai & Sons

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TOE24	3	0		3 hours	40	60	3

Course Objective

1. Promoting enhanced knowledge dissemination within the organization with the help of internal as well as external learning processes and systems.
2. Transforming individual knowledge into the structural capital of the enterprise and organization.
3. Aligning business strategy with the existing core competencies of the organization and its capabilities.

Knowledge Management

Unit 1: Introduction: Definition, evolution, need, drivers, scope, approaches in Organizations, strategies in organizations, components and functions, understanding knowledge; Learning organization: five components of learning organization, knowledge sources, and documentation.

Unit 2: Essentials of Knowledge Management; knowledge creation process, knowledge management techniques, systems and tools.

Unit 3: Organizational knowledge management; architecture and implementation strategies, building the knowledge corporation and implementing knowledge management in organization.

Unit 4: Knowledge management system life cycle, managing knowledge workers,knowledge audit, and knowledge management practices in organizations, few case studies.

Unit 5: Futuristic KM: Knowledge Engineering, Theory of Computation, Data Structure.

SUGGESTED BOOKS & REFERENCE:-

1. Knowledge Management – a resource book – A Thohothathri Raman, Excel, 2004.
2. Knowledge Management- Elias M. Awad Hasan M. Ghazri, Pearson Education
3. The KM Toolkit – Orchestrating IT, Strategy & Knowledge Platforms, Amrit Tiwana, Pearson, PHI, II Edn.
4.The Fifth Discipline Field Book – Strategies & Tools For Building A learning Organization – PeterSenge et al. Nicholas Brealey 1994
5. Knowledge Management – Sudhir Warier, Vikas publications
6. Leading with Knowledge, Madanmohan Rao, Tata Mc-Graw Hill.

ELECTRONICS & COMMUNICATION ENGINEERING Effective From 2017-18 (CBCS)

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC6TOE25	3	0		3 hours	40	60	3

Course Objective

Objective of this course to introduce
1. the multidisciplinary character of engineering systems,
2 design of these complex systems, and
3. Introduce the various concept of optimization.

Engineering System Design Optimization

Unit1: Introduction- Optimization problem formulation, optimization algorithms, applications and examples, different optimization methods available.

Unit 2: Single Variable optimization-Optimization criteria, bracketing methods – Exhaustive search method, bound phase method; Region Elimination methods – Fibonacci search method, Golden search method; Gradient based methods – Newton Raphson method, Bisection method; Root finding using optimization technique.

Unit 3: Multi objective optimization- Optimization criteria, Different search methods, Unidirectional search, Direct search method – Evolutionary optimization method, Powell"s 74 conjugate direction method; Gradient based methods – Newton"s method and Variable metric method.

Unit 4: Specialized Methods- Integer programming, Geometric programming, simulated annealing, Global optimization using - steep descent method, simulated annealing.

Unit 5: Genetic algorithms and evolutionary approaches-Differences and similarities between genetic algorithms and traditional techniques, operators of GA"s, Computer program for simulated annealing, Newton Raphson method, Evolutionary optimization method.

SUGGESTED BOOKS & REFERENCE:-

1. *Kalyanmoy Deb, "Optimization for Engineering design", Prentice Hall, India, 2005.*
2. *Kalyanmoy Deb, "Multi objective optimization using Evolutionary algorithms", John Wiley, 2001.*
3. *Taha, Operations Research, TMH 2010*

Subject outcomes:

1. Engineering systems modeling for design and optimization.
2. Selection of design variables, objective functions and constraints.
3. Overview of principles, methods and tools in multidisciplinary design optimization (MDO) for systems.
4. Subsystem identification, development and interface design.
5. Review of linear and non-linear constrained optimization formulations.