List of Courses Focus on Employability/ Entrepreneurship/ Skill Development

Department : *Electronics and Communication Engineering*

Programme Name : *B.Tech.*

Academic Year : 2018-19

List of Courses Focus on Employability/ Entrepreneurship/Skill Development

Sr. No.	Course Code	Name of the Course
01.	EC01TBS01	Mathematics-II
02.	EC01TBS02	Chemistry
03.	EC01TES01	Programming for Problem Solving
04.	EC01TES02	Engineering Mechanics
05.	EC01PBS01	Chemistry Lab
06.	EC01PES01	Programming for Problem Solving Lab
07.	EC01PES02	Workshop Manufacturing & Practices
08.	EC01PES03	Engineering Mechanics Lab
09.	EC01PMC01	Induction Training Programme
10.	EC02TBS03	Physics
11	EC02TES01	Basic Electrical Engineering
12	EC02TBS04	Mathematics-I
13	EC02THS01	English
14	EC02TMC01	Environment Sciences
15	EC02PBS02	Physics Lab
16	EC02PES04	Basic Electrical Engineering Lab
17	EC02PES05	Engineering Graphics & Design Lab
18	EC3THS03	Engineering Economics
19	EC3TPC01	Signals and Systems
20	EC3TBS01	Engineering Mathematics-III
21	EC3TES01	Network Analysis And Synthesis
22	EC3TES02	Electronic Devices
23	EC3TPC02	Digital Logic Circuits
24	EC3PES02	Electronics Devices Lab
25	EC3PPC02	Digital Logic Circuits Lab
26	EC4TBS02	Numerical Analysis

27	EC4TPC03	Automatic Control Systems
28	EC4TPC04	Analog Circuits
29	EC4TPC05	Communication System-I
30	EC4TPC06	Electronics Measurements & Instrumentation
31	EC4PPC04	Analog Circuits Lab
32	EC4PPC05	Communication System-I Lab
33	EC4PPC06	Electronic Measurements & Instrumentation Lab
34	EC5TPC07	Lic & Its Application
35	EC5TPC08	Communication System- II
36	EC5TPC09	Electromagnetic Field Theory
37	EC5TPE01	Microprocessor & Its Application
38	EC5TPE02	Data Structure & Operating System
39	EC5TOE11	Computer Architecture
40	EC5TOE12	OOP in C++
41	EC5TOE13	Introduction to Information Security
42	EC5TOE14	Project Management
43	EC5TOE15	Rural Technology and Community Development
44	EC5PPC07	LIC & ITS APPLICATION Lab
45	EC5PPE01	Microprocessor & Its Application Lab
46	EC5PPC08	Communication System -II Lab
47	EC6TPC10	Digital Signal Processing
48	EC6TPC11	Antenna & wave prapogation
49	EC6TPE03	Data Communication & Computer Networking
50	EC6TPE04	Fundamental of VLSI Design
51	EC6T0E21	UNIX, Operating System
52	EC6T0E22	Probability & Stochastic Process
53	EC6TOE23	Advanced Instrumentation
54	EC6T0E24	Knowledge management
55	EC6T0E25	Engineering System Design Optimization
56	EC6PPE02	VHDL Lab
57	EC6PPC06	Digital Signal Processing Lab
58	EC6PSP01	Seminar
59	EC7TPC12	Microwave Engineering
60	EC7TPC13	Wireless Mobile Communication
61	EC7TPE05	Advance Hardware Design

62	EC7TPE06	Power Electronics
63	EC7TOE31	Wireless Sensor Network
64	EC7TOE32	Information theory and coding
65	EC7TOE33	Nanotechnology
66	EC7TOE34	Optical instrumentation and measurement
67	EC7TOE35	Neural Network and Fuzzy Logic
68	EC7TPPC12	Microwave Engineering Lab
69	EC7TPPE05	Comprehensive Viva
70	EC7PSP02	Project-I
71	EC8TPC14	Radar and Satellite Engineering
72	EC8TPC15	Optical Fiber Communication
73	EC8TPE07	VLSI Fabrication Methodology
74	EC8TOE41	Basic building block of Microwave Engineering
75	EC8TOE42	Principle of Management
76	EC8TOE43	Mobile Computing
77	EC8TOE44	Embedded System
78	EC8TOE45	Advanced Power Electronics
79	EC8TPPC15	Optical Fiber Communication Lab
80	EC8TPPC16	Advanced RF and Microwave Design lab
81	EC8TPSP03	Project-II
82	EC8TPSP04	Comprehensive Viva
83	IT7100	Research Methodology in engineering
84	ECE7102	Vaccume Technology
85	ECE7103	Finite Element Method
86	ECE7104	Sensors Measurement Science & Technology
87	ECE7105	Artificial Intelligence

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

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC4TPC05	3	1		3 hours	40	60	4

COMMUNICATION SYSTEM – I

UNIT – 1

Random Variables & Processes: Probability, Random Variables, Cumulative Distribution Function, Probability density function, average value & Variance of Random Variable, co relation between random variables, Random process, auto correlation and Power spectral density of random process, classification of random process.

UNIT – II

Amplitude Modulation: Review of Signal Analysis, Introduction to communication system, Frequency Translation ,A Method of Frequency Translation, Recovery of Baseband Signal, Amplitude Modulation, Maximum Allowable Modulation, The Square-Law Demodulation, Spectrum Of An AM Signal, Modulators & Balanced Modulators, Single Sideband Modulation, Method Of Generating A DSB signal, An SSB Signal, VSB, Multiplexing, Block Diagram of AM Transmitter & super heterodyne receiver.

UNIT – III

Exponential Modulation: Phase & Frequency Modulation: Mathematical representation of FM & PM signals, Relationship Between Phase & Frequency Modulation, Phase & Frequency Deviation, Spectrum Of An FM Signal, Transmission BW of FM waves, Phasor Diagram For FM waves, WBFM & NBFM , Generation of FM waves: Indirect FM (Armstrong Method), Direct FM, Demodulation of FM waves, Balanced frequency discriminator – Zero-crossing detector, comparison of AM and FM systems. Block Diagram of FM Transmitter & Receiver.

UNIT – IV

Mathematical Representation of Noise: Sources of noise, Frequency domain Representation of Noise, spectral component of noise, effect of filter on PSD of noise , superposition of noise, quadrature component of noise, resistor noise, available power , noise temperature, noise figure, two port cascaded systems, noise bandwidth, effective input noise temperature, White noise.

UNIT – V

Noise in CW Modulation: AM Receiver model, Signal to noise ratios for coherent reception, DSB-SC receiver, SSC-SC receiver, Noise in AM receivers using envelope detection, AM threshold effect, FM receiver model, Noise in FM reception, Capture effect in FM, Threshold effect, FM threshold reduction, Pre-emphasis and De-emphasis in FM.

SUGGESTED TEXT BOOKS:-

1. *"Principles of Communication System", Taub & Schilling, TMH*
2. *"Electronic Communication System", George Kennedy, TM*
3. *"Principles of Communication Systems", Simon Haykin, John Wiley, 2nd Ed.*

REFERENCE BOOKS:-

1. *Communication System", R P Singh & S D Sapre , TMH*
2. *" Modern Analog and Digital Communication",B.P Lathi 3rd edition, Oxford Press*

Sub Code	L	T	P	Duration	IA	ESE	Credits
EC4TPC06	3	0	0	3 hours	40	60	3

ELECTRONIC MEASUREMENTS & INSTRUMENTATION

UNIT – I

Measurements, Significance of measurement, Methods of measurement, Instruments and measurement system, Classification of Instruments, Mode of Operation, Application of measurement system, Characteristics of instrument and measurement system; Elements of a Generalized Measurement System, Accuracy and precision, Significant figure, types of error, Probability of error.

UNIT –II

Electromechanical Indicating Instruments: Operating forces, Constructional Details, Types of Support, Torque/Weight Ratio, Control system, Damping- Air friction and Eddy current damping, D'Arsonaval Galvanometer- construction, Torque Equation, Dynamic Behavior, Response of Galvanometer, Ballistic Galvanometer, PMMC- Construction, Torque Equation, Voltage/Current Measurement: Ammeter, Voltmeter, Ohmmeter, Multimeter (V.O.M.), Ratiometer, Megger, High frequency Measurement: Q-meter

UNIT – III

AC Bridge: Introduction, Sources and Dectectors, General equation for ,bridge balance, General form of AC Bridge. Maxwell's Bridge, Hay's bridge, Anderson's bridge, De-Sauty's bridge, Schering bridge, Wien's bridge, Electronic Instruments: Introduction, Advantage of Electronic voltmeter, VTVM, Differential voltmeter, Electronic voltmeter using rectifier, True RMS reading voltmeter, Calorimeter power meter.

UNIT – IV

Transducers: Classification of transducer, Primary & Secondary, Passive & Active, Analog & Digital, Potentiometer, loading effect, Strain Gauge, Thermistor, Construction of thermistor. Thermocouple, LVDT, Advantage & Disadvantage of LVDT, RVDT, Capacitive Transducer, Piezo-electric transducer. Hall-effect Transducer, Capacitive Transducer, Pressure Transducer.

UNIT – V

Display devices: Digital display method, Segmental display- 7segment & 14 segment display, dot matrix, LED, LCD, TFT, Plasma display, DLP, Digital voltmeter (DVM): Types of DVM, Ramp type DVM, Integrating type DVM, Potentiometer type (non-integration type), Recorders: Analog Recorder, Null type Recorder, Single point Recorder, Graphical strip chart, X-Y recorders, Magnetic tape recorder, FM recorder, CRO: Introduction, Block diagram, CRT, Functional block diagram of sampling, Storage, Dual trace and dual beam oscilloscope.

SUGGESTED TEXT BOOKS:-

1. *Modern Electronic Instrumentation and Measurement Technique, W D Cooper & A D Helfrick, PHI 2000*
2. *A Course in Electrical and Electronic Measurements and Instrumentation, A K Sawhney Dhanpat Rai & Sons, 2010*

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

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

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*