SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
SECOND YEAR, COMPUTER SCIENCE AND ENGINEERING

SEMESTER-III

S.NO.	CODE NO.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	TOTAL	
1	CS2101	Object Oriented Programming In C++	3	1	-	40	60	100	4
2	CS2102	Digital Logic And Design	3	1	-	40	60	100	4
3	CS2103	Electronics Devices And Circuits	3	1	-	40	60	100	4
4	CS2104	System Analysis & Design	3	1	-	40	60	100	4
5	CS2105	Mathematics III	3	1	-	40	60	100	4
PRACTICAL									
1	CS2106	Computer Programming Lab (C++)	-	-	3	30	20	50	2
2	CS2107	Digital Logic & Design Lab	-	-	3	30	20	50	2
3	CS2108	Electronics Devices And Circuits	-	-	3	30	20	50	2
		Total	15	5	9			650	26

IA- Internal Assessment
ESE – End Semester Examination

SCHEME FOR EXAMINATION
B.TECH (FOUR YEAR) DEGREE COURSE
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SEMESTER-IV

S.NO.	CODE NO.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	TOTAL	
1	CS2201	Discrete Structure & Fuzzy Techniques	3	1	-	40	60	100	4
2	CS2202	Computer Organization Architecture	3	1	-	40	60	100	4
3	CS2203	Data Communication & Networks	3	1	-	40	60	100	4
4	CS2204	Data Structure & Programming Methodology	3	1	-	40	60	100	4
5	CS2205	System Software	3	1	--	40	60	100	4
PRACTICAL									
1	CS2206	Data Structure & Programming Lab	-	-	3	30	20	50	2
2	CS2207	Data Communication & Networking Lab	-	-	3	30	20	50	2
3	CS2208	System Software	-	-	3	30	20	50	2
		Total	15	5	9			650	26

IA- Internal Assessment
ESE – End Semester Examination

CS2101   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.

REFERENCE BOOKS:
- Object Oriented Programming With C++ by M. P. Bhave
  S. A. Patekar, Pearson Education
- Object Oriented Programming With C++ by E. Balaguruswamy.
- Object Oriented Programming in turbo C++ by Robert Lafore.
- Programming with C++ by D. Ravichandan.
- Programming with C++(SOS) by Hubbard.

CS2102   DIGITAL LOGIC AND DESIGN

UNIT-I   BINARY SYSTEM
Binary Number , Number Base conversion , Octal and Hexadecimal Numbers Complements, Binary Codes
Binary Storage and Registers , Binary Logic , Integrated Circuits
BOOLEANAL GBRA AND LOGIC GATES:
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 . IC
Digital Logic Families. NAND, NOR, EOR gates.

UNIT II BOOLEAN FUNCTIONS COMBINATION LOIGC
The map method Two and Three Variable Maps, Four Variable Map Product of sums Simplification, NAND
and NOR implementation, Don't Care Conditions, The Tabulation Method
COMBINATIONAL LOGIC Introduction, Design procedure Adders, Sub tractors .Code Conversion,
Analysis Equivalence Functions

UNIT III COMBINATIONAL LOGIC WITH MSI AND LSI
Introduction Binary Parallel Adder,   Decimal, Adder, Magnitude Comparator, Decoders, Multiplexers, Read
– Only Memory (ROM), Programmable Logic Array (PLA) Concluding Remarks

UNIT IV SEQUENTIAL LOGIC
Introduction, Flip –Flops, triggering of Flips –Flops, Analysis of   Clocked   Sequential   Circuits,   State
Reduction and Assignment. Flip –Flop Excitation Tables Design Procedure. Design of Counters, Design with
State Equations.

UNIT V REGISTERS, COUNTERS, MEMORY UNIT & FPGA PROGRAMING
Introduction, Registers, shift Registers .Ripple Counters, Synchronous Counters. Timing Sequences, The
Memory Unit Examples of Random Access Memories, FPGA: Introduction, FPGA Programming

REFERENCE BOOKS:
- Digital Logic & Computer Design PH1 M Mano
- Switching Circuit & Finite automata –ZVI Kohavi (TMH)
- Fletcher W.I.: An engineering approach to Digital design PH1

CS2103   ELECTRONIC DEVICES AND CIRCUITS

UNIT –I JUNCTION DIODE AND ITS APPLICATION:
Properties of P-N Junction, Open Circuited P-N Junction, Current component of PN Diode, V-I Characteristics, Temperature dependence of V-I Characteristics, Diode resistance, Diode as a rectifier-Half wave & Full wave rectifier, Clipper, Clamper.

UNIT –II BIPOLAR JUNCTION TRANSISTOR AND FET:
Introduction to Bipolar Junction Transistor, Transistor current components. Transistor as an amplifier, Transistor construction, Transistor Circuit Configuration (Common Base , Common Emitter, Common Collector) and Characteristics CE current gain, Analytical expression for transistor characteristics. Introduction to JFET, MOSFET, V-I and Transfer characteristics of JFET.

UNIT – III LOW FREQUENCY TRANSISTOR AMPLIFIER:
Graphical Analysis of CE amplifier, h-parameter Models, Transistor hybrid model, Analysis of Transistor amplifier using H-Parameter for CB, CE, CC configurations, Comparison of Transistor Amplifier Configuration, Darlington Pair.
HIGH FREQUENCY: CE hybrid-pi model: Validity and parameter Variation, Current Gain with Resistive load, frequency response of a single stage CE Amplifier, Gain-Bandwidth product.

UNIT-IV FEEDBACK AMPLIFIER:
Classification of feedback amplifier, Feedback concept, Properties of feedback amplifier, Effect of feedback on gain and impedance, Emitter and Source follower.
OSCILLATOR: Barkhausen criteria, Wien bridge, Tuned, Hartley, Colpitt and RC Phase shift oscillators.

UNIT –V OPERATIONAL AMPLIFIERS:
OPAMP Symbol and terminal characteristics, Block Schematic of OPAMP, Ideal OPAMP Characteristics, Practical OPAMP Characteristics, Inverting Amplifier, Non-Inverting Amplifier, Voltage Follower, Adder, Substractor, Comparator, Integrator, Differentiator, IC Timer-555, Introduction to Multivibrators, Monostable, Bistable, Astable Multivibrator.

REFERENCE BOOKS:
- Integrated Electronics: Analog & Digital Circuit Systems – Jacob Millman & Halkias, TMH.
- Electronic Devices and Circuit Theory – Boylestad & Nashelsky, 8th Ed. PHI.
- Electronic Devices & Circuits – Allen Mottershead, PHI

CS2104   SYSTEM ANALYSIS & DESIGN

UNIT I
Overview of system analysis and design, Business system concepts, System development life cycle, the role of system analyst.

UNIT II
System planning and initial investigation, fact-finding analysis, determination of feasibility, information gathering.

UNIT III   Feasibility Studies
Technical and Economical feasibility, Cost benefit analysis
System requirement specification and analysis, fact finding techniques: E.R. diagrams, DFD, Data Dictionary, Decision tables and trees, process organization and interaction .structured English, Advanced Modeling methods.

UNIT IV System Design
Modularizations, Module specification, file design, system development involving database, program design practical design.

UNIT V System Implementation
System control, Quality assurance, System administration and training, conversion and operation plans, Hardware and Software selection.

REFERENCE BOOKS:
- Modern Systems Analysis and Design, 3/e, Jeffrey A. Hoffer, Joseph S. Valacich Joey George, Pearson Education
- Rajaranam V. "System Analysis and Design ", PH
- Murdic R.G.Rose , J.E. & Claggtt J.R. "Information System For Modem Management " PHI
- Wigards K. Svensson A. Sehong P.A. & Dahlgran G. "System Analysis Design And Information System ", TMH
- Thoms , R. & Prince " Information to System For Planning Control " PHI
- Hawrys Zbiewyes , I.T. " Information to System Analysis and Design ", PHI
- Sem J. A. "Analysis and Design of Information System ", TMH
- Elias M. Award " System Analysis And design ", Galgotia

CS2105   MATHEMATICS-III

UNIT-I FUNCTIONS OF A COMPLEX VARIABLE:
Complex variable, function of complex variable, limit, continuity, and differentiability of a function of a complex variable. Analytic functions, Cauchy- Riemann equations, Orthogonal curves, harmonic functions, conformal mapping, bilinear transformation (Mobius transformation) Cauchy integral theorem, Caucy integral formula, Cauchy's inequality Taylor theorem, Laurent's theorem.

UNIT-II FOURIER SERIES AND FOURIER TRANSFORM:
Periodic function, Fourier series, Dirichlet's conditions for a Fourier series. Advantages of Fourier series and determination of Fourier coefficients, Fourier series of function of periods 2, change of interval, Even Odd functions, half range sine and cosine series, practical harmonic analysis, Fourier transformation, Fourier sine and cosine transform, properties of Fourier transform.

UNIT-III LAPLACE TRANSFORMATION:
Laplace transformation, properties of Laplace transformation, first shift theorem, Laplace transform of the derivative of f(t), multiplication and division by t. Unit step function: Laplace transformation of unit function, second shifting theorem, Laplace transform of function and periodic function. Inverse Laplace transformation Multiplication by s, division by s, first shifting property, second shifting property, inverse Laplace transform of derivatives , solution of differencial equations by Laplace transform

UNIT-IV CORRELATION & REGRESSION:
Scatter diagram, Linear Correlation, Measures of Correlation. Karl Pearson's Coefficient of correlation, Limits for correlation coefficients, Coefficient of correlation for   bivariate frequency distribution, Rank correlation, Linear Regression, Equations to the line of Regression. Regression coefficient. Angle between two lines of Regression.

UNIT–V THEORETICAL DISTRIBUTIONS:
Discrete and Continuous probability distribution's. Mathematical expectation, Mean and Variance, Moments, Moments generating function, probability distribution ,Binomial, Poisson and Normal distribution, Test of significance sassed on chi-square, T, F, and Z distribution degree of freedom , conditions for applying X^2 (chi-square) test , student's test.

REFERENCE BOOKS:
- B.S. Grewal Higher Engg. Mathematics
- KreyszigE " Advanced Engineering mathematics"
- Prasad C " Advanced Engineering mathematics"
- Pati T " Functions of complex variables"
- Dass H.K. " Advanced Engineering mathematics"
- Ray M. " Mathematics statistics"

CS2201   DISCRETE STRUCTURE & FUZZY TECHNIQUE

UNIT I
Pre- provisional and predicate crisp sets relation and function, Fuzzy complement, Fuzzy union, fuzzy intersection combination of operations general Aggregation operation.

UNIT II FUZZY RELATIONS
Crisp and fuzzy relations binary relations, Binary relations on a single set Equivalence and Similarity Relations, Compatibility or Tolerance Relations Cord rings, Marphisms, Fuzzy relation Equations

UNIT III
Lattices semi group ring fields etc . Counting Techniques –pigeon -hole principal –infinite sets mathematical induction permutations (with repetition etc) Generating functions . Recurrence Relations & their solution

UNIY IV GRAPH THEORY WITH APPLICATIONS TO ENGINEERING AND COMPUTER SCIENCE
Graph, finite and infinite Graph, Incidence and degree, isolated vertex, pendent vertex and Null   graph
PATH AND CIRCUITS: Isomorphism, sub graph, walks, paths   and circuits connected graphs disconnected graph s and components, Euler graph operations on graph mare on Eular graph Hamiltonian paths and circuits   dictograph same type of diagraph and binary Relation, Eular Diagraphs trees with Directed Edges.

UNIT V MATRIX REPRESONTAQTION OF GRAPHS
Inside once matrix, Sub matrices of A (G), circuit matrix fundamental circuit matrix and rank of B chromatic Number, chromatic polynomial Four color Problem Five color Tearoom
APPLICATION-General Application of graph in switching and coding theory in Electrical network Analysis and in operation research graph in computes programming

REFERENCE BOOKS:
- Fuzzy   Sets, Uncertainty And Information George J. Klir & Tina A, Floger
- Fuzzy Sets & Fuzzy Logic George J.Klir
- Graph Theory
- Discrete Mathematical Structures With Applications To Computer Science J, P, Tremblay & R, Manohar
- Discrete Mathematical Structures Bernard Kolman, Robert C, Busby And Sharon Ross.
- Rosen : Discrete Maths (6/7addition)
- Sussanna Epp (Third Editions)

CS2202   COMPUTER ORGANIZATION ARCHITECTURE

UNIT I
Principles of computer design – Software/Hardware interaction, cost/benefit concepts of layers in architecture design.
Basic computer Organization taking 8085 as an example, binary arithmetic's – add, subtract, multiply, divide – algorithms and implementations. Carry look ahead and fast adders.

UNIT II
CPU design – Choice of instruction set , Control structure hardwired and micro programmed control ,– RISC Vs CISC , Pipelining in CPU design , Superscalar machines .
Memory hierarchy design – Caches, Main memory, Internal memory, virtual memory, Architectural aids in implementing these.

UNIT III
I/O Modes: Programming. Interrupt, DMA. Channel, I/O Processor, .I/O Performance measures, Buses connecting I/O devices to CPU/ Memory, Interaction with operating system, Serial/Parallel Interfaces taking 8251 and 8255 as example.

UNIT IV
Performance evaluation – SPEC marks, LINPACK, Whetstone, Dhrystone etc. Transaction processing benchmarks.

UNIT V
Multiprocessor – Parallel & distributed computers – SIMD, SPMD and MIMD machines.

REFERENCE BOOKS:
- Computer system architecture by M. Morris Mano, Pearson Education
- Patterson and Hennessy ,Compter Architectures , Morgaon Kauffman , San Mateo , CA ,USA ,1992.
- P.Pal Chaudhary, Computer Organisation and Design ,Prentice Hall of India Pvt.Ltd. New Delhi, 1994.
- P.V.S.Rao , Perspectives in Computer Architecture , Prentice Hall of India Pvt. Ltd. New Delhi, 1994.
- M.R. Bhujade , Digital Computer Design Principles , Pitambar Publishing Co. , 3rd Edition , 1996.

CS2203   DATA COMMUNICATION & NETWORKS

UNIT I   INTRODUCTION
Uses of Computer Networks, Networks Hardware Network Software Reference Models, Example Networks. Example Data Communication Services, Network Standardization
The physical Layer-The Theoretical basis for Data Communication, Transmission media, Wireless transmission, The Telephone system, Narrow broad ISDN Broadband ISDN Cellular Radio, Communication Satellite.

UNIY II   THE DATA LINK LAYER
Data Layer Design issues, Error Detection and Correction, Elementary Data link Protocols, Sliding Window Protocols Protocol Specification and Verification example Data Link Protocols.
The Medium Access Sub layer –The Channel Allocation Problem, Multiple Access Protocols, IEEE Standard 802 for LANS and WANS Bridges, High Speed LANS, Satellite Networks.

UNIT III   THE NETWORK LAYER
The Network Layer Service Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking. The Network Layer in the internet.

UNIT IV THE TRANSPORT LAYER
The Transport Layer Services, Elements of Transport Protocols & simple Transport Protocols (TCP and UDP), The SOM, ALL Layer Protocols, Performance issues.

UNIT   V THE APPLICATION LAYER
Network Security. DNS–Domain Name System Electronic Mail Usenet News, The World Wide Web Multimedia.
Multistage Interconnection Networks – Introduction, types, Routing, Blocking, Performance Evaluation. Mobile Communication Introduction, Wireless AAM.

REFERENCE BOOKS:
- Data communication and Networks (Stalling) Pearson Education
- Computer Network BY Andrew S. Tanenbaum
- Computer Network And Internets By Douglas E. Comer .
- An Engineering Approach to Computer Networking by S. Keshav
- Computer Network and system Queuing Theory and Performance Evaluation by Thomas G Rahutazzi
  .

CSTH2204 DATA STURCTURE & PROGRAMMING METHODOLOGY

UNIT I
String algorithms, pattern search and editing, Arrays algorithms development simple examples of algorithm development, complexity, Divided & conquer binary search, selection sort, insertion sort, merge sort, quick sort complexity of sorting.

UNIT II
Linear list: Stacks, application of Stacks, arithmetic notations, recursion, queues and circular queues, Linked list definition in C, creation and deletion of nodes, circular and doubly linked list.

UNIT III
Trees, AVL trees, threaded trees, heap sort, tries and B- tress.

UNIT IV
Graph and representation: graph algorithms, optimization and Greedy methods, minimum spanning tree, shortest path, DFS, BFS search, examples of backtracking sets UNION and FIND operations tables and information retrievals, hashing.

UNIT V
Files: File organization, sequential file, direct file organization, index sequential file organization, Data storage and management.

REFERENCE BOOKS:
- Data Structures and Algorithm Analysis in C++, 2/e by Mark Allen Weiss, Pearson Education
- Wirth Niclaus , "Algorithm + Data Structure = Programs " PHI
- Horwitz E. and Sahani S. "Fundamentals and Data Structure ", Computer Science Press.
- Knuth D. "Threat of Computer Programming ", Vol 1-2 Addision - Wesley 1970-80
- Aho A.V.Hopcraft and Ullman J.E. "Data Structure and Algorithms " addsion Wesley ",1992.
- Tanonbaum , A.M.and Augenstein , M.J. "Data Structure with Pascal" PHI 1985.
- Trambley and Sorenson "Data Structure using Pascal " , MGH 1985.
- Stubbs D. "Data Structure with Abstract Data Type and Modula 2", Brooks & Cole Publication Comp 1987

CS2205   SYSTEM SOFTWARE

UNIT I
Machine architecture, instruction set, addressing modes of chooses machine, arithmetic and logic operations and floating -point operations.
C Programming review of syntax of C with emphasis on features like pointers, bit operations, Pre-processors files. Programming example of text handling file management, interface and device drivers programming in C.

UNIT II
DOS: Introduction to interrupts, software interrupts, interrupts call from C, internal structure of DOS, COM & EXE program's BIOS memory resident programs, Running batch files.

UNIT III
Assemblers, Cross assemblers, two assembler design data structure and algorithms.

UNIT IV
Macro processors: Definitions, nested macro definitions, macro expansion and conditional macro expansion.

UNIT V
Linking, loading and relocation, static and dynamic linking, loading and relocation Editors, Debuggers, Programming environments.

REFERENCE BOOKS:
- System Software : An Introduction to Systems Programming, 3/e by Leland L. Beck, Pearson Education
- Donovan J. J. "System Programming ", TMH
- Dhamdhare D.M. " Introduction to system software's",TMH 1986
- Michael Tischer , " PC System Programming ", Abacus.
- Cooper Mullish , " The Sprit of C, An Introduction to modern programming ", Jaico publication New Delhi 1987.
- Dhamdhare " System Programming And Operating System ", TMH
- Gottfried , " Programming with C, Schaum Series ", TMGH.