

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

SEMESTER-V

S.N O	CODE NO.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDITS
			L	T	P	IA	ESE	TOTAL	
1	CS3101	Microprocessor And Interfaces	3	1	-	40	60	100	4
2	CS3102	Operating System	3	1	-	40	60	100	4
3	CS3103	Computer Oriental Numerical Method	3	1	-	40	60	100	4
4	CS3104	Parallel Computing	3	1	-	40	60	100	4
5	CS3105	Formal Language & Automata Theory	3	1	-	40	60	100	4
PRACTICAL									
1	CS3106	CONM Lab	-	-	3	30	20	50	2
2	CS3107	Operating System Lab	-	-	3	30	20	50	2
3	CS3108	Microprocessor Lab	-	-	3	30	20	50	2
		TOTAL	15	5	9			650	26

IA- Internal Assessment

ESE – End Semester Examination

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SEMESTER-VI

S.NO .	CODE NO.	SUBJECT	PERIODS			EVALUATION SCHEME			CREDIT S
			L	T	P	IA	ESE	TOTAL	
1	CS3201	Advance Programming Through Java	3	1	-	40	60	100	4
2	CS3202	Computer Graphics	3	1	-	40	60	100	4
3	CS3203	Software Engineering	3	1	-	40	60	100	4
4	CS3204	RDBMS	3	1	-	40	60	100	4
5	CS3205	Design And Analysis Of Algorithm	3	1	-	40	60	100	4
PRACTICAL									
1	CS3206	Computer Graphics Lab	-	-	3	30	20	50	2
2	CS3207	RDBMS Lab	-	-	3	30	20	50	2
3	CS3208	Java Programming Lab	-	-	3	30	20	50	2
		TOTAL	15	5	9			650	26

IA- Internal Assessment

ESE – End Semester Examination

CS3101 MICROPROCESSOR AND INTERFACES

UNIT I

Architecture of 8086 : CPU architecture : Internal operation ,Machine language instructions , Instruction execution timings . The 8088 System bus structure: Basic 8086/8088 configuration, system bus timings, Interrupt priority management, Bus Standards.

UNIT II

Assembly Language Programming: Instruction format, Data transfer instructions, Arithmetic instructions, Branching and looping instructions, NOP and HLT. Flag manipulation instructions. Logical shift and rotate instructions, Directives and operators, Assembly process, Translation of assembler instructions.

UNIT III

Modular Programming: Linking and relocation, Stacks and procedures, Interrupts and interrupt routines
Macros Program design.

Byte and String manipulation, String instructions, REP Prefix Table translation, Number format conversions.

UNIT IV

I/O Interfaces: Serial communication interface, Parallel communication interface programmable times and event counters keyboard and display interface, Block transfers and DMA, Dynamic RAM & its controllers, I/O Design example, Diskette controller, Maximum mode and 16-bit interface design.

Multiprocessor configurations: Queue status and lack facility, 8086/8088 based multiprocessor systems, Numeric data processor 8087, I/O Processor 8089.

UNIT V

80386 – Basic Architecture : Memory capacity, 32-bit architecture, Data types, Tasks address, Calculation, Page-base virtual memory, Segment and page protection, Additional exceptions, Input/output, Pipelining. General-purpose registers, Real protected and virtual mode operations, Address segmentation, Segment length, paging segment registers, Flags Special fields, Instruction pointer address registers machine status word debug and test registers, Addressing techniques, Scaling Bit addressing exceptions, Overview of the instruction set.

Introduction to 80486 microprocessor & Pentium, Memory management.

REFERENCE BOOKS:

- Microcomputer System 8086/8088 Family – Architecture Programming and design : Y Liu and G. A. Gibson : Prentice Hall
- 80386 Microprocessor Handbook C.H. Pappas and W. H. Murray :Osborne McGraw Hill
- Microprocessor Architecture Programming and Application : R.C. Gaonkar : Wiley Eastern.
- Microprocessor 8086 , 80386 & Pentium , Barry B. Brey
- Programmed Logic and Microprocessor K.L. Short , Prentice Hall of India

CS3102 OPERATING SYSTEM

UNIT I

Introduction to Operating System objective and function . system components system services, System structure, batch interactive , time-sharing and real time operating system, Protection.

The introduction of window NT, DOS, Window 07, UNIX, Linux (Red hat)

UNIT II

Concurrent Process: Process concepts, principal of concurrency, the producer consumer problem, the critical section problem, semaphore, classical problem in concurrency, inter process communication, process generation, process scheduling .

UNIT III

CPU Scheduling: scheduling concepts, performance criteria scheduling algorithms, Algorithm evaluation, multiprocessor scheduling.

I/O management and Disk scheduling I/O devices and organization of the I/O functions. I/O buffering disk I/O operating system design issues.

UNIT IV

Dead Locks system models, deadlock characterization, prevention, avoidance and detection recovery from deadlock, combined approach.

UNIT V

Memory Management : Base machine , Residence monitor , multiprogramming with fixed partition , multiprogramming with variable partitions, multiple base register , paging , segmentation , paging segmentation, virtual memory concepts , demand paging performance , page replacement algorithms , allocation of frames, thrashing , cache memory organization impact on performance .

REFERENCE BOOKS:

- Milenkovic M. , “Operating System concepts “, MGH
- Tanenbaum A. S. “Operating System design and implementation “, PHI
- Silberschartz A.and Patterson J.I. , “ Operating system concepts “, Wisley.
- Stilling William “ Operating System “, Maxwell McMillan International Edition 1992.
- Dectel H.N. , “An introduction to operating system “, Addison Wisley.

CS3103 COMPUTER ORIENTED NUMERICAL METHOD

UNIT I NUMERICAL SOLUTIONS OF ALGEBRIC AND TRANSCENDENTAL EQUATIONS

Graphical method, Bolzano method, Regula Falsi method, Newton Raphson method Secant method and iteration method

NUMERICAL SOLUTIONS OF SIMULTANEOUS LINEAR EQUATIONS

Cramer's rule, Matrix Inversion method, Gauss Elimination method, Crout's method, Gauss Jordan method, Gauss Siedal method and Relaxation method.

UNIT II NUMERICAL DIFFERENTIATION AND INTEGRATION

Derivatives using Forward, Backward, Central & Divided difference Formula, Maxima & Minima of a tabulated Function.

Numerical Integration - Newton - Cotes Quadrature Formula, Trapezoidal rule, Simpson's one-third rule, Simpson's three-eighth rule, Boole's rule & Weddle's rule.

NUMERICAL SOLUTION OF ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS :

Elliptic equation, Solution of Laplace & Poisson's Equations Parabolic & Hyperbolic Equation. Picard's method, Taylor's Series, Euler's method and Runge Kutta's IV order method.

UNIT III MATRIX INVERSION

Gauss Elimination method, Gauss Jordan method, Crout's triangularisation method & Partition method,

INTERPOLATION WITH EQUAL & UNEQUAL INTERVALS -Newton's Forward & Backward Difference Formula, Stirling's, Bessel's & Everett's Central Difference Formula, Lagrange's Formula and Newton's Divided Diff Formula.

UNIT IV LINEAR PROGRAMMING

Formulation of the problem, Graphical method, General LPP, Standard & General form, Simplex method, Artificial variable technique, Primal (Dual) & Dual(Primal) method, Big M method, Two Phase method, Duality Concept and Dual Simplex method

UNIT V- PREPARATION OF FLOW CHART AND FORTRAN PROGRAMMING OF :

Bolzano method, Regular -Falsi method & Newton-Raphson method, Matrix Inversion and solution of Simultaneous Equation by Gauss Elimination Method & Crout's Method, Interpolation by Newton Forward Method & Lagrange's Method, Picard's Methods & Runge Kutta's IV Order Method, Integration by Trapezoidal Rule, Simpson's 1/3rd rule & Simpson's 3/8th Rule, Least of Square Best Fit Curve Methods.

REFERENCE BOOKS:

- Computer Oriented Numerical Methods by V. Rajaraman.
- Numerical Methods for Scientific and Engineering Computation by Jain, Lyengar & Jain.
- Numerical Analysis by G. Shanker Rao.
- Numerical Methods in Engineering and Science by B.S.Grewa
- C.Mead and L.Conway Introduction to VLSI

CS3104 - PARALLEL COMPUTING

UNIT I

Introduction - architectural classification schemes, SISD, SIMD, MISD, MIMD architectures, multiprocessor and multicomputer, UMS, NUMS, COMS, NORMS model, function organization of instructions in IBM 360/91.

UNIT II

System Interconnect architecture – static, dynamic, multistage interconnection networks, design considerations throughputs, delay, blocking and non blocking properties interconnected memory organization - C-Access, S-Access, C-S access.

UNIT III

Principal of Pipelining - Over lapped parallelism, principal of Liner pipelining processor, General pipelining and reservation tables, arithmetic pipelining, Design of pipeline Instruction units, arithmetic pipelining design example, hazard detection and resolution, JOB sequencing and collision prevention.

UNIT IV

Advanced processor technology – RISC & CISC computers, super scalar architecture, principles of multithreading, multithreaded architectures of MP systems.

Context switching policies, shared variables, locks, semaphores, monitor , multitasking and Cray multiprocessor.

UNIT V

Exploiting parallelism in programme -multidimensional arrays, directed acyclic graphs, distance and direction vectors, data flow computer and data flow graphs.

REFERENCE BOOKS:

- Computer architecture and parallel processing by Hwang and Briggs.
- Advanced computer Architecture by Kai Hwang.

CS3105 FORMAL LANGUAGES AND AUTOMATA THEORY

UNIT I

Deterministic and non deterministic finite automata , Regular Expression , Two way finite automata , finite automata with output , properties of regular set , pumping lemma , closure properties, My-Hill Nerode Theorem.

UNIT II

Context Free Grammars (CFG), derivation trees, Simplification normal forms, Chomsky Hierarchy: Regular Grammars, Unrestricted Grammars and Relations Between Classes of languages .

UNIT III

Push Down Automata: Definitions relationship between PDA and Context Free Languages, properties of CGL's Decision Algorithms.

UNIT IV

Turing Machine : The Turing machine model , Computable languages and functions, Modification of Turing machines Church's Hypothesis.

UNIT V

Properties of recursive and recursive enumerable languages, Universal Turing machine, Undesirability Post correspondence problem introduction to recursive function theory.

REFERENCE BOOKS:

- Hopcroft and Ullman " Introduction to Automata Theory Languages and Computation ", Narosa.
- Mishra and Chandrashekharan, " Theory of Computer Science ", PH.
- Kohan " Theory of Computer Science".
- Korral " Theory of Computer Science".

CS3201 ADVANCE PROGRAMMING THROUGH JAVA

UNIT I BASICS OF JAVA

Overview of java: java features, jvm, jdk versions, variable, data types, dynamic initialization, type casting and conversions, operators, decision making , control statements, iteration statement, working with arrays.

UNIT II CLASS, INTERFACE AND PACKAGES

Classes: A closer look at methods and classes, declaring objects, reference variable, Constructors, garbage collection, access specifiers in class Inheritance, polymorphism, aggregation, overloading, local class, anonymous class, inner class, top level nested class.

Interfaces: define interface, extend interface, import interface.

Package: defining package, importing package and CLASSPATH.

UNIT III EXCEPTION HANDLING AND THREADS

Exception handling: Introduction, types of exception, using try and catch, multiple try catch, nested try block, throw ,throws and finally.

Multithreading : creating thread, priority, synchronization, thread scheduler, running and yielding, sleeping and waking up, waiting and notify, suspend and resume.

UNIT IV APPLLET AND AWT

Packages :input/output, networking and util collections.

Applet : introduction to applet, creating an applet, applet life cycle, applet and thread, using image and sound in applet.

AWT : introduction to AWT, containers, control component and layout managers.

UNIT V ADVANCE JAVA | J2EE

JDBC : introduction to jdbc, jdbc/odbc bridges,driver manage class.

Web based programming : introduction to servlet, HTML/DHTML, Working with browsers and practical approach to web designing using servlet.

REFERENCE BOOKS:

- Java2 basics By E. Balaguruswamy
- The complete Reference – Java2 by Patrick Nanghton and Herhert shield.
- Java2 programming : khalid A.Mughal, R.W. Resmussen (publisher : Addison Wesley)

CS3202 COMPUTER GRAPHICS

UNIT I

Line Generation Points, lines, Planes Vector, pixels and frame buffers, Vector and character generation. Graphics Primitives, Display devices, Primitive operation, Display- file structure, Display control text.

UNIT II

Polygons: Polygons representation, Entering polygons, Filling Polygons.

Transformation: Matrices Transformation, transformation routines Display procedures.

UNIT III

Segments: Segments table, Creating Deleting and renaming a segment Visibility, Image transformation.

Windowing and Clipping: Viewing transforming, Clipping, Generalized clipping, multiple windowing.

UNIT IV

Three Dimensions: 3-D Geometry Primitives, Transformation, Projection, Clipping, Hidden line and Surfaces Back-face Removal Algorithms, Hidden line methods.

UNIT V

Rendering and Illumination:

Introduction to curve generation. Bezier. Hermit and B-spline algorithms and their comparisons.

REFERENCE BOOKS:

- Hearn Baker, "Computer Graphics", PHI.
- Rogers , "Procedural Elements of Computer Graphics ", McGraw- Hill.
- Newman & Sproule , "Principles of Interactive Computer Graphics", MGH 1987.
- Harringtons S. , "Computer Graphics , " A Programming Approach Second Edition MGH 1987.
- Rogers & Adams , " Mathematical Elements of Computers Graphics", Second Edition MGH.
- Henry Baper , "Computer Graphics"

CS3203 SOFTWARE ENGINEERING

UNIT I

Software Engineering – What is software, Characteristics of software, Application of software, Software Process Models - Linear Sequential model, Prototype model, RAD model, Incremental model, Component Based Development Model, Fourth Generation Techniques.

UNIT II

MANAGING SOFTWARE PROJECT

The Management Spectrum: People, Product, Process, Software Process and Project Metrics - Measures, Metrics and Indicators. Process and Project Metrics, Software Measurement-Size Oriented Metrics, Function Oriented Metrics, Metrics for Quality-Overview, Measuring Quality, DRE. Software Requirement Specification-Problem Analysis, Requirement Specification. Validation. Metrics, monitoring and control. Models, the Make /Buy Decision.

UNIT III

System Design: Problem portioning, abstraction, top-down and bottom-up design, Structured approach, Functional versus Object oriented approach, design specification and verification, metrics, monitoring and control.

UNIT IV

Coding: Top-down and bottom-up structured programming, information hiding, programming style, internal documentation, verification. Metrics, monitoring and control

UNIT V

Software testing: software Testing fundamentals, white box testing, Basics path testing, A strategic Issues, Unit testing, Integration testing, validation testing, System Testing
Software Project Management - Cost estimation, project scheduling, Staffing, Software configuration management, Quality assurance, Project Monitoring, Risk management etc.

REFERENCE BOOKS:

- Software Engg: Pressmen
- Software Engg: Pankaj Jalote
- Software Engg: Shaum's Outline Series

CS3204 RELATIONAL DATA BASE MANAGEMENT SYSTEM (RDBMS)

UNIT I INTRODUCTION TO DATA BASE

Advantages of DBMS , Type of data Models, Schema and instances, DBMS Architecture and Data independence , Entity-Relationship Model , Attributed and Keys, Relationship types, Weak Entity set, Strong Entity set Enhanced E –R Modeling , Specialization and Generalization ,

UNIT II THE RELATIONAL DATA MODEL

Relational data model concepts, constraints, relational algebra, relational calculus, Tuple relational calculus SQL: DDL, DML, Types of constraints, Defining different constraints on a table, Defining & Dropping integrity constraints in the alter command .View, Index

UNIT III DATA BASE DESIGN

Functional dependencies And Normalization for Relational Database : Informal design guidelines for relation schemes , Function dependencies , Normal forms based on primary keys, General definitions of second and third normal forms, Boyce – codd normal form problem related with normal forms & solutions. Multivalued & Join Dependencies 4th &5th Normalization.

UNIT IV QUERY & TRANSACTION PROCESSING

Query Processing: Query Processing Stages, Query interpretation, Query execution plan , Table scans, Fill factor , Multiple index access, Methods for join tables scans, Structure of a query optimizer. Transaction processing: Types of failures, ACID property, schedules and recoverability, serialbility of schedules , Levels of transaction consistency , Deadlocks, Nested transaction , Transaction Benchmarking

UNIT V CRASH RECOVERY

Failure classification, Different type of Recovery techniques & their comparative analysis. Deferred update, immediate update, shadow paging , Check points , on-line backup during database updates, **Concurrency control** : Different types of concurrency control techniques, &their comparative analysis, Locking techniques, Time stamp ordering , Multi – version techniques, Optimistic techniques, Multiple granularity. Integrity, Security, Non-procedural and procedural integrity constraints, Integrity constraints specifications in SQL.

TEXT BOOKS:

- Database system concept, korth & Sudarshan, MH
- Database Design Fundamentals, Rische, PHI

REFERENCE BOOKS:

- PRINCIPLES OF Database system “ 2nd Edn Ullman , J.O. Galgotia publications
- Introduction to database system , C.J. Date , Pearson Education
- Fundamentals of Database system , Elmasri & Navathe , Pearson Education

CS3205 DESIGN AND ANALYSIS OF ALGORITHM

UNIT I PERFORMANCE ANALYSIS

Space and Time Complexity, Asymptotic Notations.

Divide and Conquer: Finding Maxima and Minima Binary search, Merge Sort, Quick Sort, selection sort.

UNIT II GREEDY METHOD

Knapsack problem, Job Sequencing, Optimal Merge Patters, and Minimum Spanning trees.

Dynamic Programming: All pairs shortest path, optimal binary search tree, o/1 knapsack problem, traveling sales man problem, flow shop scheduling.

UNIT III SEARCH TECHNIQUES

Techniques for binary trees, techniques for graphs –DES and BFS, connected components and spanning tree, Bi-connected components and DFS.

Backtracking: The 8-queen problem , graph coloring , Hamiltonian cycles.

UNIT IV BRANCH AND BOUND

O/1 knapsack problem, traveling sales person problem, efficiency consideration, Algebraic Problems, lower Bound theory.

UNIT V NP HARD AND NP COMPLETE PROBLEM

Basic concepts, problem classes, P, NP, NP hard, NP complete problem, deterministic and non deterministic polynomial time algorithm

REFERENCE BOOKS:

- Horowitz E & Sahani S, “Fundamentals of Computer algorithms” , Galgotia.
- Aho , Hopcroft & Ullman , “the design and Analysis of computer Algorithms” Addison –Wesely
- Sedgewick , “Algorithms in C”