M.SC., COMPUTER SCIENCE

FIRST YEAR

PAPERS	Subject	Max. Marks	Exam Hrs
1	Advanced Microprocessors and its Applications	100	3
2	Object Oriented Analysis Design	100	3
3	Data Base Management System	100	3
4	Advanced Computer Architecture	100	3
5	Web Based Technology	100	3
Practical 1	OOAD & Web Based Technology	100	3

SECOND YEAR

PAPERS	Subject	Max. Marks	Exam Hrs
1	Modern Operating System	100	3
2	Client / Server Technology	100	3
3	Principles of Compiler Design	100	3
4	Multimedia & its Applications	100	3
5	Advanced java programming	100	3
Practical 2	Advanced Java programming	100	3
	Project Work	200	-

First year

Paper - 1

ADVANCED MICROPROCESSORS AND ITS APPLCIATIONS

UNIT-I

Introduction: General structure of Microprocessors - Microprocessor Architecture - Pipelining.

UNIT-II

The Intel x86 family architecture: Introduction - Register Set - Data Formats - Addressing modes - Instruction set and assembly directives - Interrupt Segmentation - Paging Real time virtual Mode Execution.

UNIT - III

Study of Intel family of Advanced Processors: Intel 80286, i386,i486 and the Pentium.

UNIT - IV

The Motorola MC680xO Architecture: Introduction - CPU Registers - Data Formats Addressing Modes - Instruction set and Assembly Directives -Memory Management - Instruction and Data Caches - Exception Processing: Study of M68000 Family Microprocessors.

UNIT-V

RISC Processors: RISC Principles - The DEC Alpha AXP : Introduction Alpha AXP Architecture - Alpha AXP Implementation. The Power PC Family: Introduction - Power PC Architecture – Power PC 601 -IBM RS/6000.

TEXT BOOK:

I. Daniel Tabak, 'Advanced Microprocessors', 2nd Edition, McGraw Hill Inc, 1995.

REFERENCE BOOKS:

I. M. Ratiquzzaman, 'Microprocessors- Theory and Applications: Intel and Motorala', PHI, 1994.

2. Gilmore, 'Microprocessors - Principles and Applications', McGraw Hill, International edition,. 1995.

3. Douglas V. Hall, 'Microprocessors and Interfacing - Programming and Hardware', TMH, 1997.

Paper - 2

OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT-I

Complexity - The object model: Evolution - elements - applications - Classes and objects - nature - relationship among classes and objects - building classes and objects.

UNIT - II

Classification: Importance of classification -identifying classes and objects - key abstraction and mechanisms - The Notation: Elements of notation – Class diagram -State transition diagram - Interaction diagrams - Module diagrams Process diagrams- Applying notations.

UNIT-III

The Process & Pragmatics: The process - The first principles - Micro und macro development process - Pragmatics - management and planning staffing_ -release management - reuse - quality assurance-documentation tools -special topics benefits and risks of object oriented development.

UNIT-IV

Data Acquisition - Frameworks - Client I Server Computing.

UNIT - V

Artificial Intelligence - Command and control

TEXT BOOK:

1. Grady Booch. 'Object Oriented Analysis and Design'. The Benjamin cummings publishing company. Second edition. 2001.

REFERENCE BOOKS:

1. James Rumbaugh, et al. 'Object - Oriented Modeling and Design'. PHI. 1998.

Paper - 3

DATA BASE MANAGEMENT SYSTEM

UNIT I:

Introduction to Database system – Relations – Integrity constrains – Enforcing Integrity constrains – Query Languages – File Organizations and Indexes.

UNIT II:

Tree Structured indexing : ISAM – B+ trees – Format of a node : Search, Insert, Delete, Duplicates, B+ trees in practice multidimensional indexes – Hash based indexing.

UNIT III:

Relational algebra and calculus – SQL : The Query language – Security, views and SQL.

UNIT IV:

Conceptual design and the ER model – Schema refinement and normal forms.

UNIT V:

Parallel and distributed databases – Object database systems – Basic concepts of Network Model and Hierarchy model.

TEXT BOOKS:

1. Database Management Systems – Raghu Ramakrishna, Mc. Graw Hill International Edition 1998.

REFERENCE BOOKS:

1. Database System concepts – Abraham silberschatz, Henry.F. Korth and S. Sudarsan – Mc. Graw Hill, 3rd edition, 1997.

2. Database system management systems – Majumdar, TMH.

Paper - 4

ADVANCED COMPUTER ARCHITECTURE

UNIT-I

Theory of Parallelism: The state of computing - multiprocessors and multi computers multi vector and SIMD computers - PRAM and VLSI models - . architectural development tracks: Programs and Network properties: Conditions of Parallelism -program partitioning and scheduling - program mechanisms -.system interconnect architecture.

Principles of Scalable Performance: Performance metrics and measures parallel processing applications- speed up performance laws - scalability analysis and approaches.

UNIT-II

Hardware Technology - Advanced processor technology - superscalar and vector processors memory hierarchy technology - virtual memory technology back plane bus systems - cache memory organization- shared memory organizations- sequential and weak consistency models.

UNIT-III

Pipelining and Super scalar Techniques: Linear pipeline processors - non linear pipeline processors - instructions pipeline designs -arithmetic pipeline designs superscalar and super pipeline designs.

UNIT -IV

Multi processors and multi computers: Microprocessors system interconnects cache coherence and synchronization mechanisms- 3 generations of multi computers - message passing mechanisms.

Multi vector and SIMD computer: Vector processing principles – multi vector multiprocessors - compound vector processing- SIMD computer organizations

- the connection machine CMS. 36

UNIT - V

Scalable, Multithread and Data flow Architectures: Latency hiding techniques Principles of multithreading - fine grain multi computers - scalable and multithreaded architectures -dataflow and hybrid architecture

TEXT BOOK:

1. Kai Hwan, Advanced Computer Architecture: Parallelism, Scalability and Programmability, McGraw Hill Inc, 1993.

REFERENCE BOOK:

1. Kai Hwang & F.A. Briggs, 'Computer Architecture and Parallel Processing, McGraw Hill Inc, 1985.

Paper – 5

WEB BASED TECHNOLOGY

UNIT - I

Introduction to internet - Resources of, internet - H/w & S/w requirements of internet - Internet service -Protocols - Concepts - Internet clients and internet servers.

UNIT – II

Introduction to HTML - Function of HTML in web publishing - Basic structural-Elements und their usage - Traditional text and formatting - Style. sheets formatting - Using tables for organization and layout - Advanced layout and positioning ;with style sheets - forms - frames and frame sets – Using images with HTML - Merging Multimedia, controls and plug-ins with HTML - Using the HTML object model and creating dynamic HTML pages - manipulating objects and responding to user interactions - Saving using preferences - Cookies and OPS.

UNIT- III

Scripting basics - Client side image maps - Introducing Java Script – Creating simple Java scripts - Using Java Scripts for forms - Using Java Scripts with Style sheets. Introduction to Java programming - JVM - Applet programming - Java Beans - JARS and Sate Computing -Integrating Java and Java Script.

UNIT –IV

Introduction to CGI and scripting languages for server side- Types of scripting language - Basis CGI - CGI Application - User Interaction - DB connectivity - Web, indexing specific technologies for server side programming - Introduction to ASP - Active server objects - Active server components Database Management with ASP - Java Network Programming - Java servlets - serialization and RMI - JDBC.

UNIT - V

Emerging and alternate Web Technologies - ActiveX controls for. the WWW XML - COM - DCOM - CORBA - E-Commerce

TEXT BOOKS:

1. Shelly Powers et al , "Dynamic Web Publishing", Techmedia, 1998.
2. Jamic Jaworski, "Java 1.2 Unleashes", Techmedia, 1998.
3. Robert Niles et al, "CGI by Examples", Que. 1996.
4. Scot Johnson ct 111 , "Using Active Server Pages", Que. 1997.

Second Year

Paper - 1

MODERN OPERATING SYSTEM

UNIT –I

Introduction - Hardware concepts - Software concepts - Design issues System models - Load balancing - Client server model - Remote Procedure calls - Process migration.

UNIT-II

Clock synchronization - Mutual exclusion - Election algorithms - Atomic transactions - Deadlocks - Threads.

UNIT – III

Processor allocation - scheduling - Distributed File System design Implementation- Trends in distributed file systems.

UNIT-IV

Real time Operating systems: Introduction - Performance measures for Real Time Systems - Estimating program Run Times. Task Assignment and Scheduling: Introduction - Classical uniprocessor - Scheduling Algorithms - RM Scheduling Algorithm [only description] - Preemptive EDF Algorithm[Only description] - Task Assignment - Mode changes - Fault Tolerant Scheduling.

UNIT - V

Real time databases : Real Time Vs Gener\11 purp9se Databases – Main, memory databases - Transaction priorities - Transaction aborts -. Concurrency control issues - Databases for hard real time systems - Real time communications.

TEXTBOOKS:

1. A.S. Tanenbaum, Modern operating Systems', Prentice Hall of India 1977 (Unit I, II & III).

2. C.M. Krishna and Kang G. Shin, 'Real - Time Systems' , McGraw Hill, 1997. [Unit IV & V).

REFERENCE BOOKS:

1. Sinha.P. "Distributed Operating System', PHI.

Paper - 2

CLIENT / SERVER TECHNOLOGY

UNIT - I

Basic concepts of client/server - Characteristics - File servers – Database servers - Transaction servers - Groupware servers - Object Server,- Web Servers Fat Servers or Fat Clients-2 ,tier versus 3 tier – Client / server Building Blocks Operating system services base services. Extended services server scalability client Anatomy.

UNIT – II

NOS Middleware – peer to peer communications – RPC – MOM Middleware – MOM versus RPC – The fundamentals of SQL and relational database – server architecture – stored procedures, Triggers and Rules.

UNIT – III

Online transaction processing – Decision Support Systems – OLTP versus DSS programming effort. Database needs – Data warehouses – Elements – Hierarchies – replication versus direct access – Replication mechanism – EIS / DSS tools – Client / Server transaction processing : Transaction models – TP Monitors – Transaction management Standards.

UNIT – IV

Groupware – Components – Distributed objects and components CORBA: Components - Object Management architecture – services – Business Objects.

UNIT – V

Client / Server distributed system management – components – Management application – The Internet Management protocols – OSI management framework – The desktop management interface – X / open Management standards – Client / Server application development tools – Client / Server Application Design.

TEXT BOOKS

1. “The Essential Client / Server Survival Guide”, Robert Orfali, Dan Harkey and Jeri, Edwards, Second Edition, Galgotia.

REFERENCE BOOKS

1. “Client / Server Computing”, Dawna Travis Dewire, TMH

Paper - 3

PRINCIPLES OF COMPILER DESIGN

UNIT – I

Introduction to Compilers: Simple one-pass compiler – Lexical Analysis.

UNIT – II

Symbol tables: Incorporating a symbol table – symbol tables – entries – list data structures for symbol table – Hash tables – scope information – syntax analysis – parsing.

UNIT – III

Syntax – directed translation – Type checking type systems – specifications of simple type checker.

UNIT – IV

Runtime organization: Source language issues Organizations – Storage allocation strategies – parameter passing. Intermediate code generation: Intermediate languages – declarations – assignment statements – Boolean expressions – case statements.

UNIT – V

Code generation: Issues in design of code generator – target machine – run-time storage management – basic blocks and flow graphs – a simple code generator. Code optimization: Introduction – principle sources of optimization of basic blocks – loop in flow graphs.

TEXT BOOKS:

1. A.S. Aho. R. Sethi and J.D. Ullman, compilers – Principles, Techniques and tools, Addition Wesley Publishing Company, 1986.

Reference:

1. Allen L. Holub, 'Compiler Design in C', Prentice Hall of India, 1993.

Paper – 4

MULTIMEDIA AND ITS APPLICATIONS

UNIT – I

Definition – Multimedia hardware – Multimedia software – Multimedia networking – Multimedia applications – Multimedia environments – Multimedia computer components – Multimedia standards – Multimedia PC.

UNIT – II

Text Entering Text – Positioning – Sizing – Editing – fonts – Shadowing – Cloning – Building. Image and Graphs: Backdrops – Hanging pictures – Positioning capturing and converting Graphs – Compressing Bitmaps – controlling palates. Triggering: Hypertext – Hyper picture – Buttons – Editing links – Triggering in Backdrops – Analog Operating Systems support for Multimedia – CD family – Various CD – Formats – CD – ROM Format.

UNIT – III

Digital Audio Representation and Processing: digital Representation of Sound – Transmission of Digital Sound – Digital signal processing of sound – Speech Recognition and synthesis, Wave for Audio Recording – CD Audio clip making – MIDI sequencing Video Technology – Digital video and image compression. Video compression Technique – JPEG Image compression Standards – MPEG Motion Video – compression Standards – Various File Storage, Digital Video Recording – Video clip making.

UNIT – IV

File standards for Internet: SGML, HTML, XML – MINE – Voice mail – Video Tele conferencing – problems: Bandwidth – Performance measurement, Multimedia presentation and Authoring: Design paradigms and User Interface – Multimedia Application with case studies.

UNIT – V

Virtual Reality: Introduction – A generic VR System – Virtual environment – VR Technology – Modes of interaction – VR Hardware – Sensor Hardware, Head coupled displays – Acoustic hardware – Integrated VR – VR Software – Modeling Virtual words – Physical simulations – VR applications.

Reference:

1. Free T. Hotstetter, 'Multimedia Literacy', Mcgraw Hill, 1995.
2. Simon J, Gibbs, Dinoysios C. Tschriziz, 'Multimedia Programming', Addison Wesley, 1995.
3. John F. Koefgel Buford, 'Multimedia Systems', Addison Wesley, 1994.
4. John Vince, 'Vitrual Reality Systems', Addison Wesley, 1995.

Paper - 5

ADVANCED JAVA PROGRAMMING

UNIT – I JAVA BASICS REVIEW

Java streaming - Networking - Event handling - Multithreading - Byte code Interpretation - Customizing application - Data Structures - Collection classes.

UNIT – II DISTRIBUTED COMPUTING

Custom sockets - Remote Method Invocation - Activation - Object serialization - Distributed garbage collection - RMI - IIOP - Interface definition language - CORBA - JINI overview.

UNIT – III JAVA BEANS AND SWING

Bean concepts - Events in bean box - Bean customization - Persistence - Application - deployment using swing - Advanced swing techniques - JAR file handling.

UNIT – IV JAVA ENTERPRISE APPLICATIONS

JNI - Servlets - Java Server Pages - JDBC - Session beans - Entity beans - Programming and deploying enterprise Java Beans - Java transactions.

UNIT – V RELATED JAVA TECHNIQUES

Java Media Frame work - 3D graphics - Internationalization - Case study - Deploying n-tier application, E- commerce applications.

References:

1. Deitel & Deitel , "Java How to program" , Prentice Hall , 4th Edition, 2000.

2. Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.

3. Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.