

MASTER OF COMPUTER APPLICATIONS (MCA) – FOURTH SEMESTER

Fourth Semester		
Sr. No.	Name of Subject	Credits
1	Computer Graphics	5
2	Computer Architecture	5
3	Internet & E-Commerce	4
4	Discrete Mathematics	4
5	Project Work	4
Total		22

Subject Name-COMPUTER GRAPHICS

1. Keyboard, Touch Panel, Light pens, Graphic tablets, Joysticks, Touch balls, Image scanner, Mouse, Handy copy device:-Zero impact and Non-Impact printers, Dot matrix, Laser printer, Inkjet printer, Dectrostate, Flatted and drum plotters. Video display devise:-Cathode Rey tube, Resistance, Resolution ,Aspect ratio vertical and horizontal ,Color CRT monitors, Direct view storage tube, Flat panel displays, LCD Virtual reality, Faster scan system, Random scan system. Memory device:-Memory (RAM, ROM), CD, Floppy disk, Magnetic tapes, Magnetic disks.
2. Scan conversion algorithm for line (DDA & Bresenham’s algorithm) ,Midpoint circle ,Circle & ellipse, Midpoint ellipse, Midpoint ellipse ,Bresenham’s algorithm ,Area filling techniques, Scan line polygene fill, Boundary fill character generation.2-dimensional Graphics: Cartesian & Homogeneous coordinate system, Geometric transformations, Affine transformation (Translation, Scaling ,Rotation, Reflection, Shearing),Composite transformation ,Affine Viewing pipeline, Two dimensional viewing transformation and clipping(Line, Polygon and Text).
3. Three Dimensional Graphics:-Geometric transformation (Translation, Scaling, rotation, reflection, shearing), Composite transformations, Mathematics of projections (parallel & perspective), View pipeline, 3D viewing transformations and clipping (normalized view volumes, view port, clipping).
4. Hidden line and surface elimination algorithms, Z-buffer, Scan-line, Sub-division, and Painter’s algorithm. Illumination Models: Diffuse reflection, specular reflection, refracted light, Texture surface patterns, half toning, dithering. Surface rendering methods: Constant intensity method, Gourmand shading, Hong shading. Color Model: Introduction to RGB, CMY & HSV color models.

Subject Name:-COMPUTER ARCHITECTURE

1. **Processor Organization:** General structure of CPU registers, Stack, operation of stack, ALU and control unit. Instruction format, mathematical operations, fixed point addition, multiplication or division. Principle of arrays and pipeline processors, principle of instruction decoding and implementation, hardwire and micro-instruction based control unit.

2. **Design of Controller:** Identifying micro-instruction, minimizing micro-instruction, size, parallelism in micro instruction, encoding control instruction, timing cycle and clock generation, organization of micro-Programme based control unit.
3. **Memory Organization:** Static memory, dynamic memory, memory hierarchies, memory refresh, paging concept of memory compaction, interleave memory and principle of address interleaving associative memory, memory segmentation, block address calculation, concept of cache memory.
4. **Data Transfer Technique:** Various I/O devices, IOP, CPU configuration

Subject Name: INTERNET AND E-COMMERCE

1. **Overview of E-Business:** Introduction, Overview of E-Business, Activities using E-Business, E-Business Tools, Advantages of E-Business, The Scope of the Internet and the Web.
2. **Electronic Commerce:** Introduction of E-Commerce, History of E-Commerce, Definition of E-Commerce, Basic Function of Electronic-commerce Systems, The Technologies of E-Commerce, Types of E-Commerce, The Driving Forces of Electronic Commerce, Frame Work of E-Commerce, Issues in Implementing Electronic Commerce, Benefits of E-Commerce, The Limitations of E-Commerce, Benefits of the E-Commerce Market, Increasing Interest in Interfacing Technologies, The Internet, Computer Networks and E-Commerce.
3. **Electronic Payment System:** Introduction, Electronic Payment System, The Need for New Payment Systems Designed for E-Commerce, User Acceptance of Electronic Payment Systems, Characteristics of Electronic Payment System, Classification of Electronic Payment System, Smart Cards, Credit Card System, SET (Secure Electronic Transactions), PayPal, Micro-payments for Information Goods.
4. **Business to Business E-Commerce:** Introduction to B2B-Business to Business, B2B Evolution, Types of Transactions in B2B, Business-to Business Electronic Commerce Models.
5. **Mobile Commerce:** Introduction, The Unique Characteristics of M-Commerce, Driving Forces of M-Commerce, Limiting Factors of M-Commerce, Mobile Customer and Applications, Challenges and Opportunities in M-Commerce, Security in M-Commerce.
6. **Mobile Banking:** Introduction, Technology and Security Standards in Mobile Banking, Mobile Banking Architecture, Mobile Banking Services, Advantages of Mobile Banking.
7. **Internet:** Introduction of Internet, The History of the Internet, Internet Systems, Internet Applications and Application Protocols, Advantages of Internet, Disadvantages of Internet, Domain Name System, Transmission Control Protocol/Internet Protocol, TCP/IP and the Internet.
8. **Firewall System:** Introduction of Firewall, Types of Firewalls, Proxy Servers, Common Attacks on System.
9. **Electronic Data Interchange:** Introduction, EDI Standards, Advantages of Using EDI Over Paper Systems, EDI Technology
10. **Supply Chain Management:** Introduction, Faces of Supply Chain Management, Elements of the Supply Chain Management, Functions of Supply Chain Management, Supply Chain Management Technology, Value Chain Management.

Subject Name: DISCRETE MATHEMATICS

1. **Fundamental Concepts & Vectors:** Group Rings, Fields, Spaces -Linear, Dependence of Vector, Linear Transformation, Bilinear forms, Eigen values and Eigen vectors.
2. **Fundamental Concepts, Algorithms & Applications :** Basic Terminologies of graph theory, Multi-graphs and weighted graphs, Paths and circuits, Planar graphs, Trees and rooted trees , Spanning trees and cut sets, Coloring covering and portioning , Directed graphs, enumeration of graphs theoretic algorithm and application.