Semester VI

Subject Code	Subject Name	Max.Marks
BCA125	Elective I	200
BCA126	Elective II	200
BCA507	Main Project	400

Candidates who are promoted to Semester VI have to choose any two papers of their interest from the following list of Electives.

Elective I and Elective II:

1. E-Commerce and Applications
2. Advanced Data Base Management System
3. Advanced Computer Architecture
4. Network Management and Security
5. Optimization Techniques
6. Image Processing

1. E-Commerce and Applications

Introduction:
The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective Business Strategy in an Electronic Age. Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business Strategy, Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Exiting Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

Business-to-Business Electronic Commerce:
Characteristics of B2B EC, Models of B2B Ec, Procurement Management Using the Buyer's Internal Marketplace, Just in Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet Based EDI, Intergration with Back-end Information System, The Role of Software Agents for B2B EC, Electronic marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

Internet and Extranet:
Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet and Extranet, Intranet software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment, The Extranets, The structures of Extranets, Extranet products & services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues. Electronic Payment Systems : Is SET a failure, Electronic Payments & Protocols, Security Schemes in Electronic payment systems, Electronic Credit card system on the Internet, Electronic Fund transfer and Debit cards on the Internet, Stored – value Cards and E- Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

Public Policy:
From Legal Issues to Privacy : EC- Related Legal Incidents, Legal Incidents, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection In EC Infrastructure For EC · It takes more than Technology, A Network Of Networks, Internet Protocols, Web- Based client/ Server, Internet Security, selling on the web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues.

References:

1. E-Commerce- David Whiteley, Tata McGraw Hill
2. Electronic Commerce- Eframi Turban, Jae Lee, David King, K. Michale Chung.

2. Advanced Data Base Management System

Query Processing, Optimization & Database Tuning: Algorithms For Executing Query Operations.Heuristics For Query Optimizations, Estimations Of Query Processing Cost, Join Strategies For Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering & Indexing, Multiple Attribute Search Keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue In RDBMS.

Extended Relational Model & Object Oriented Database System: New Data Types, User Defined Abstract Data Types, Structured Types, Object Identity, Containment, Class Hierarchy, Logic Based Data Model, Data Log, Nested Relational Model And Expert Database System.

Distributed Database System: Structure Of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel & Pipeline Join, Concurrency Control In Distributed Database System, Recovery In Distributed Database System, Distributed Deadlock Detection And Resolution, Commit Protocols.

Enhanced Data Model For Advanced Applications : Database Operating System, Introduction To Temporal Database Concepts, Spatial And Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues In Real Time Database Design. Introduction To Expert Database And Fuzzy Database System.

References:

1. Majumdar & Bhattacharya, "Database Management System", TMH.
2. Korth, Silbertz, Sudarshan, " Database Concepts", McGraw Hill
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley.

3. Advanced Computer Architecture

CPU architecture:
Comparative study of 32-bit processors, Comparative study of Microcontrollers; Future Trends.

Parallel Processing Systems:
Flynn's Classification, Pipeline Processors, Instruction Pipelining, Internal Forwarding, Pipeline Hazards, Job Sequencing & Collision prevention, Interleaved Memory, Vector Processing, Design of Vectorizing compilers, Automatic detection of parallelism, Amdahl's law, Case studies of vector processors, Array processors. Network design issues, Mesh Network, Barrel Shifter, Cube, Hypercube, Parallel algorithms on hyper cubes, Multiprocessor system, Multiprocessor interfacing schemes, Tightly & loosely coupled systems

Other Architectures:
RISC; Comparison with CISC; Parameter passing in RISC, Comparison of commercial RISC systems; Data flow architectures; Comparison with control flow systems; Template implementation; Transputer architecture; Communication channels; Occam & programming environment.

References:

1. Computer Architecture & Parallel processing – Hwang & Briggs
2. Advanced Computer Architecture- K Hwang
3. Designing Efficient Algorithms for parallel Computers- M.J.Quinn
4. Introduction to Parallel Algorithms- Joseph JA

4. Network Management and Security

Introduction:
Attack, Services and Mechanism, Model for Internetwork Security. Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text. Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

Network Security:

Authentication Application: Kerveros, X.509, Directory Authentication Service, Pretty Good Privacy, S/Mime

IP security Architecture:
Overview, Authentication header, Encapsulating Security Pay Load combining Security Associations, Key Management. Web Security: Requirement, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions.

Network Management Security:
Overview of SNMP Architecutre-SMMPVI1 Communication Facility, SNMPV3. System Security: Intruders, Viruses and Relate Threats, Firewall Design Principles. Comprehensive examples using available software platforms/case tools, Configuration Management

References:

1. Networks Security Essentials: Application & Standards- W. Stallings
2. Cryptography and Network Security, Principles and Practice.- W. Stallings

5. Optimization Techniques

Linear programming:
Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

Queuing Theory:
Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models(Model-I, Model-II).

Replacement Theory:
Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement. Inventory Theory Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

Job Sequencing:
Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines.

1. Gillet B.E. "Introduction to Operation Research"
2. Taha,H.A. "Operation Research - an introduction"
3. Kanti Swarup "Operation Research" 4. S.D.Sharma "Operation Research"

6. Image Processing

Introduction: Image representation and modeling, 2-D linear system, Luminance, Contrast and Brightness, Color representation, Visibility functions, Monochrome and color vision model

Image Quantization and Image Transforms: Sampling theorem, Anti-aliasing, image quantization, Orthogonal and unitary transforms, DFT, Cosine transform, Hadamard transform, Haar transform, KL transform.

Image Enhancement: Point operation, Histogram modeling, Filtering and spatial operations, Transform operations, Multi-spectral Image Enhancement

Image Restoration: Image formation models, Noise models, Inverse and Wiener filtering, Least square filters, Recursive filters, Maximum entropy method, Blind de-convolution, Bayesian method of noise removal, Image reconstruction, Tomography, Radan transform, Back-projection, Reconstruction algorithm, Algebraic method of reconstruction, Fan-beam reconstruction.

Data Compression: Data compression vs. Bandwidth, Pixel coding, Predictive coding, Transform coding, Coding of two-tone images.

References:

1. Fundamentals of Digital Image Processing: Anil K. Jain
2. Digital Image Processing: R.C. Gonzalez & R E. Woods
3. Digital Image Processing: W.K. Pratt