Second Year – First Semester

Object Oriented Programming through C++ (BCA-211)

Discipline Core (DC); 4 Credits (3-0-2)

Objectives:

1. To gain knowledge of objects, Class, Data Abstraction, Encapsulation, Inheritance, Polymorphism and Dynamic Binding.
2. To know about constructing programs using Bottom-up design approach.
3.

Unit	Contents	No. of Lectures
Unit 1	**Introduction:** What is object oriented programming? Why do we need object oriented. Programming characteristics of object-oriented languages. C and C++.Output using cout. Directives. Input with cin. Type bool. The setw manipulator. Type conversions.	**6**
Unit 2	**Object and Classes:** Making sense of core object concepts (Encapsulation, Abstraction, Polymorphism, Classes, Messages Association, Interfaces) Implementation of class in C++, C++ Objects as physical object, C++ object as data types constructor. Object as function arguments. The default copy constructor, returning object from function. Structures and classes. Classes objects and memory static class data. Const and classes	**12**
Unit 3	**Arrays and string arrays fundamentals:** Arrays as class Member Data :Arrays of object, string, The standard C++ String class	**5**
Unit 4	**Operator overloading:** Overloading unary operations. Overloading binary operators, data conversion, pitfalls of operators overloading and conversion keywords. Explicit and Mutable.	**6**
Unit 5	**Inheritance:** Concept of inheritance. Derived class and based class. Derived class constructors, member function, inheritance in the English distance class, class hierarchies, inheritance and graphics shapes, public and private inheritance, aggregation: Classes within classes, inheritance and program development.	**10**
Unit 6	**Virtual Function:** Virtual Function, friend function, Static function, Assignment and copy initialization, this pointer, dynamic type information.	**6**
		45

Reference/Text Books :

1. Herbert Schildt, "C++ the Complete Reference ", III edition, TMH 1999
2. Balagurusamy, Entrepreneurial "Object Oriented programming with C++", TMH
3. Barkakatin "objects oriented programming in C++" PHI 1995

Software Engineering (BCA-213)

Discipline Core (DC); 4 Credits(3-1-0)

Objectives:

1. At the end of the Subject, students should have a basic idea of SDLC, design and modeling, implementation and testing techniques and basic project management methodologies.

Unit	Contents	No. of Lectures
Unit 1	**Software Engineering Basics:** SDLC, Characteristics, Applications, Software Process Models: Waterfall, Spiral.	**4**
Unit 2	**Software Modelling :Overview of Software Modelling** **Structured Analysis and Design** Principles of Structured Analysis, Requirement analysis, DFD, Entity Relationship diagram, Data dictionary. **OO Analysis and Design** Objectives, Principles, Concepts, Design methodologies: Data design, Architectural design, procedural design, Object -oriented concepts.	**16**
Unit 3	**Software Implementation:** Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and	**10**

	review of correctness and readability.	
Unit 4	**System Testing fundamentals**: Objectives, principles, testability, Test cases: White box & Black box testing,Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing	**10**
Unit 5	**Project Planning and Management:** Prototyping, Concepts of Project Management, Role of Metrics & Measurements. S/W Project Planning: Objectives, Decomposition techniques: S/W Sizing, Problem-based estimation, Process based estimation, Cost Estimation Models: COCOMO Model,	**08**
		48

References/Text Books:

1. Roger. S. Pressman, "Software Engineering - A Practitioner's Approach", Third Edition, McGraw Hill, 1992
2. R.E. Fairley, "Software Engineering Concepts", McGraw-Hill, 1985.
3. Jalota, "An Integrated Approach to Software Engineering", Narosa Publishing House, 1992

Computer Network (BCA -214)

Discipline Core (DC); 4 Credits (3-1-0)

Objectives:

Upon completing the Subject, the student will:

- be familiar with the basics of data communication.
- be familiar with various types of computer networks.
- have experience in designing communication protocols.
- be exposed to the TCP/IP protocol suite.

S. No.	Topic	No. of Lectures
Unit 1	**Introduction To Computer Network:** Uses of Computer Network, Network hardware, Layered Architecture, function of the layers, Network standardization, OSI & TCP/IP Reference model, Physical	**10**

	layer services & hardware Protocols.	
Unit 2	**Data Link Control:** Framing, Flow Control: Stop and wait Protocols, Sliding Window Protocols. Error Detection & Error Control, High Level Data Link Control (HDLC),Other Data Link Control Protocols : Pure ALOHA & Slotted ALOHA , Markov chain model for S-ALOHA and delay in S-ALOHA , IEEE LAN Protocols, Ethernet, Ad Hoc network	**6**
Unit 3	**Network Layer & Transport Layer:** Network Layer Protocols: Design issues : Virtual Circuits and datagram's, Routing Algorithms: Optimality principle, Shortest path routing- Dijkstra's algorithms, Distance Vector routing, Link state routing, Flow and Congestion Control: packet discarding , Traffic shaping , Choke packets, RSVP, IP fragment, RIP, OSPF, Inside router, Network layer performance model, Poisson model, M/M/1 Queue, Blocking probability, Little's formula, Transport Layer Protocols : Basic functions, Connection Management : Establishment and releases , Crash recovery, TCP & UDP, Reliability Models, AIMD Policy.	**6**
Unit 4	**Upper Layers:** Session Layer Protocols: Dialog Management, Synchronization, Presentation layer functions: translation, encryption, compression, Cryptography: substitution and Transposition Ciphers, Data Encryption standards (DES) , DES Chaining, Breaking DES, Public Key cryptography, Authentication protocols, Different compression coding techniques. Application layer protocols & services: Email, World Wide Web, file transfer protocol, remote file server, internet telephony & chatting.	**10**
Unit 5	**Special & High Speed Networks & Network Devices:** FDDI: access method, addressing, electrical specification, frame format, comparison of FDDI-I & FDDI-II. DQDB & WAN implementation.25 networks its features. Frame Relay: operation, congestion control & frame format. SONET / SDH: layers, frame & application. Internet & related software's NETSCAPE & MOSAIC .Networking devices: Repeaters, Bridge Routers & Gateways.	**10**
		42

Text Books:

1. Computer networks", Second Ed., A.S. Tannenbaum, Prentice Hall India.
2. Data Communication, Computer Networks, Halsall, Pearson Education.

Reference Books:-

1. Data Networks, D.Bertsekas and R. Gailagher, PHI Second Ed.
2. Internetworking with TCP/IP, Vol. 1, D.E. Corner, Prentice Hall India.
3. Computer Networking with IP, Stalling, Pearson Education.

E Commerce (BCA-212)

Department Core (DC); 4 Credits (3-1-0)

Objectives:

1. Define what is E-commerce
2. Discuss the applications of E-commerce
3. Discuss the types of E-commerce
4. Describe the life cycle of implementation of E-commerce
5. Differentiate between E-commerce and other forms of commerce
6. List the modes of payments involved in E-commerce

Unit	Contents	No. of Lectures
Unit 1	**Introduction to E-Commerce:** 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.	**10**
Unit 2	**Business-to-Business Electronic Commerce:** Characteristics of B2B EC, Models of B2B Ec, Procurement Management Using the	**8**

	Buyer's Internal Marketplace, Just in Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet Based EDI, Integration 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.	
Unit 3	**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.	**10**
Unit 4	**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.	**9**
Unit 5	**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.	**8**
		45

Reference/Text Book:

1. David Whiteley, " E-Commerce", Tata McGraw Hill, 2000.

Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000.