SARDAR PATEL UNIVERSITY

B. Sc. Computer Science V Semester

Course: US05CCSC21

(Object Oriented Programming Using C++)

Effective from June-2020

Credits : 4 **Lectures per week: 4**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Object Oriented Programming (OOP) Concepts and C++** – Structured programming vs. object oriented programming – Basic OOP concepts: objects, classes, encapsulation, data hiding, inheritance, polymorphism – Introduction to C++: structure of a C++ program, data types, variables, constants, expressions, statements and operators – Usage of header files – Control flow statements: if else, for loop, while loop, do while loop, switch, break and continue
Unit 2	**Input/Output, Arrays and Working with Classes** – Basic I/O in C++ – Arrays in C++: introduction, declaration, initialization of one, two and multi-dimensional arrays, operations on arrays – Working with strings: Introduction, declaration, string manipulation and arrays of string. – Classes and objects in C++ – Constructors: default, parameterized, copy, constructor overloading and destructor – Access specifiers, implementing and accessing class members – Working with objects: constant objects, nameless objects, live objects, arrays of objects
Unit 3	**Functions, Function overloading and Inheritance** – Introduction to functions, library and user-defined functions, parameters passing, default arguments, – Functions overloading, inline functions, friend functions and virtual functions – Inheritance: Introduction, derived class declaration, forms of inheritance – Inheritance and member access ability, constructor and destructor in derived class, construction invocation and data member initialization.
Unit 4	**Operator Overloading and Pointers** – Operator Overloading: Introduction, overloaded operators, unary operator overloading, operator keyword, operator return values, binary operators overloading, overloading with friend function. – Introduction to pointer, pointer variable, pointer arithmetic – array of pointers, pointer to object – Dynamic memory allocation

REFERENCE BOOKS:

1. E. Balaguruswami: Object Oriented Programming in C++, Tata McGraw Hill Publishing Co. Ltd.
2. Robert Lafore: Object Oriented Programming in Turbo C++, Guide, Galgotia Pub (P) Ltd.

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science V Semester

Course: US05CCSC22

(Visual Programming through VB.NET)

Effective from June-2020

Credits : 4 **Lectures per week: 4**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Introduction to .NET Framework and VB.NET** – .NET Architecture, .NET Languages, Microsoft Intermediate Language (MSIL), The Just-In-Time(JIT) compiler, Working with Assemblies, The .NET framework class library – VB.NET - introduction, applications and types of project – Introduction to Visual Studio IDE – Creating simple Windows Application using VB.NET – Variables, data types, constants and operators – Type casting, Boxing and Unboxing, – Working with arrays and strings – Creating simple Windows Application using VB.NET
Unit 2	**VB.NET Basics** – Use of conditional statement (if), multi-branching statement (select) and with…End with statement, – Looping Statement: DO, FOR, FOR EACH… NEXT and WHILE, working with EXIT, CONTINUE and WITH statements – Working with procedures – Introduction, types, use of parameters, parameter passing, calling procedures – OOP concepts - Encapsulation, Inheritance, Interfaces and Polymorphism – Working with modules, classes (partial) and namespaces – Working with Windows Forms – Introduction, life cycle, basic properties, methods and events, use of simple windows forms control. – Working with SDI and MDI forms
Unit 3	**Developing Windows Forms, Exception Handling** – Working with basic controls – Button, CheckBox, CheckedListBox, ComboBox, DateTimePicker, GroupBox, HScrollBar, RadioButton, VscrollBar, Label, ListBox, PictureBox, TextBox and Time controls. – Working with advanced controls – LinkLabel, RichTextBox, ColorDiolog, FontDialog, TreeView, Working with modules, classes (partial) and namespaces – Error Handling: exception, structured exception using try…catch and final statement.
Unit 4	**Database Programming with ADO.NET and Working with Files** – ADO.NET – introduction and applications – ADO.NET – architecture (connected and disconnected) – Database connectivity using ADO.NET – Use of Data sources, Server Explorer and working with Dataset – Populating data in a DataGridView, – Working with files – Use of FileStream class, StreamWriter class, StreamReader class, BineryReader class, BinaryWriter class, File class and Directory class.

REFERENCE BOOKS:

1. Steven Holzner; VB.NET Black Book by Dreamtech publication
2. Francesco Balena: Programming Microsoft Visual Basic.NET, Microsoft Press
3. Bill Evjen, Billy Hollis, Bill Sheldon, Kent Sharkey and Tim McCarthy: Professional VB 2005 with .NET 3.0

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science V Semester

Course: US05CCSC23

(Relational Database Management System)

Effective from June-2020

Credits : 4 **Lectures per week: 4**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Relational Database Theory and Data Modeling** – The three-schema architecture for a Database Management System (DBMS) – Introduction to data models (hierarchical, network, relational) – Examples of current RDBMS products – The relational data model: concepts and terminology, operations on data (DDL, DML), relationships and relationship types – Integrity constraints – Codd rules – Entity-relationship modeling (different types of entities, attributes, relationships and their representation in the E-R diagram) – Case studies of data modeling using E-R modeling
Unit 2	**Introduction to SQL** – SQL - introduction, advantages and disadvantages – Data types – built-in (number, char, varchar2, date, raw, long raw) – Types of SQL Statements: DDL (Data Definition Language), DML (Data Manipulation Language), DCL (Data Control Language), TCL (Transaction Control Language) – Working with SQL*Plus – overview and basic commands like ed, start, get, save, exit, connect, set linesize, set pagesize and host – Creating table and inserting data - CREATE TABLE, INSERT, retrieving data using query – SELECT, manipulating data – DELETE and UPDATE, modifying and removing table – ALTER TABLE and DROP TABLE.
Unit 3	**Data Constraints and Functions** – Pseudo columns – ROWID, ROWNUM, USER, UID, SYSDATE – Null values, TAB table, DUAL table – Operators – arithmetic, relational, logical, range searching, pattern matching and set – Data constraints – Introduction, advantages and disadvantages – Type of data constraints – NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY and CHECK – Modifying constraints, working with data dictionary and use of USER_CONSTRAINTS – Functions – introduction, merits and demerits, types of functions (scalar and aggregate) – Scalar: Numeric functions (ABS, FLOOR, MOD, POWER, ROUND, SIGN, SQRT and TRUNC), Character functions (CHR, ASCII, CONCAT, INITCAP, LOWER, SUBSTR, TRIM, UPPER), Date functions (ADD_MONTHS, LAST_DAY, NEXT_DAY, MONTHS_BETWEEN), Conversion functions (TO_NUMBER, TO_CHAR and TO_DATE) – Aggregate fun: AVG, COUNT, MAX, MIN, SUM – Miscellaneous functions – NVL, DECODE, COALESCE

Unit 4	**Query, Subquery, Joins, Transaction Management and Reporting through SQL*Plus** – Query and subquery, types of subquery – Creation and manipulation of database objects – indexes, views, sequences and synonym – Joining tables, types of joins (cross join, natural join, inner join, equijoin, outer joins, self-join). – Data control language statements – GRANT and REVOKE – Transaction control language statements – COMMIT, ROLLBACK and SAVEPOINT – PL-SQL Block, CURSOR – FUNCTION AND PROCEDURE

REFERENCE BOOKS:

1. An introduction to Database Systems: Bipin C. Desai, Galgotia Publications Pvt. Ltd.
2. Ivan Bayross: SQL, PL/SQL The programming language of Oracle, 3rd revised edition, BPB Publications
3. Understanding Database Management Systems: S. Parthsarthy and B.W.Khalkar, First edition – 2007, Master Academy
4. P. S. Deshpande: SQL/PLSQL for Oracle9i, dreamtech press, reprint edition 2009

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science V Semester

Course: US05CCSC24

(Computer Networks)

Effective from June-2020

Credits : 4 **Lectures per week: 4**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Introduction** – Computer networks: definition and advantages – Classification of computer networks – Introduction and differences among Local Area Networks (LANs), Metropolitan Area Networks (MANs), Wide Area Networks (WANs) – Uses of Computer Networks – Meaning of the basic terms: topology, data rate, modulation rate, spectrum, bandwidth, server, host
Unit 2	**Data Communication Fundamentals** – Various types of transmission media - guided transmission media: magnetic media, twisted pair, coaxial cables, fiber optics – Introduction to the concept of modulation, types of modulation, serial transmission vs. parallel transmission, synchronous transmission v/s asynchronous transmission, circuit switching, packet switching – The concept of multiplexing, Frequency Division Multiplexing (FDM) vs. Time Division Multiplexing (TDM)
Unit 3	**Layered Protocols and Satellite Communication** – Protocol significance and hierarchies – Design issues for the layers – The OSI Reference model – Examples of protocols for different layers of the OSI model – Introduction to wireless networks – Communication satellites – Introduction to geosynchronous satellites
Unit 4	**Local Area Network Technology and Networking Devices** – Types and characteristics of Local Area Networks – LAN Topologies: Bus, Star, Ring, Tree, Complete (Mesh) – functions of various networking components: modems, amplifiers, repeaters, hubs, switches, bridges, routers, gateway

REFERENCE BOOKS:

1. Behrouz Forouzan, Introduction to Data Communications and Networking, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1998.
2. Tanenbaum A. S., Computer Networks, Prentice-Hall of India Pvt. Ltd., New Delhi, 1997.
3. Stallings W., Data and Computer Communications, 3rd Edition, Macmillan Pub. Company, New York, 1991.

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science V Semester

Course: US05CCSC25

(Practical - III)

Effective from June-2020

Credits : 6

No. of laboratory hours per week : 12

University examination duration : 6 Hours

Part-I : Practical based on US05CCSC21

Part-II : Practical based on US05CCSC22

Part-III: Practical based on US05CCSC23

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science

V Semester

Course: US05DCSC26

(E-Commerce)

Effective from June-2020

Credits : 2 **Lectures per week : 2**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Intranet and Extranet** – Architecture of Internet, Intranet, Extranet – Characteristics of internet, Intranet and extranet – Application of Intranet – Application of extranet
Unit 2	**Introduction to E-Commerce** – Definition, communication perspective, business process perspective, service perspective – Classification by nature of transaction: B2B, B2C, C2C, C2B, Non business EC, Intra-business EC – Classification of EC Applications: electronic market, inter organizational system, customer services – Benefits to organizations, consumers, and society – Limitations of EC, framework of EC, future of EC
Unit 3	**E-Commerce Business Models and Electronic Marketplaces** – Introduction, eight key ingredients of a business model, major B2C and B2B business models, Introduction to M-Commerce. – Marketspace components, types of electronic markets (electronic storefronts, electronic malls, types of stores and malls) – Portals and their types, role of intermediaries in E-markets, E-market success factors, competitive factors, impact of E-Market on organizations (marketing, HR, manufacturing, finance and accounting)
Unit 4	**Customer Relationship Management (CRM) and Electronics Payment system** – CRM: meaning, types of CRM, benefits and limitations of CRM, issues in CRM implementation, classifications of CRM applications, one-to-one marketing (personalization, collaborative filtering, customer loyalty, trust) – Electronic credit card system on Internet – Electronic fund Transfer and Debit card on internet – Smart card system

REFERENCE BOOKS:

1. Electronic Commerce: A managerial Perspective Efraim Turban, Jae Lee, David King, H Michael Chung (Pearson Education.)
2. E-Commerce – Business, Technology, Society Kenneth C Laudon, Carol Guercio Traver (Pearson Education)

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science

V Semester

Course: US05DCSC27

(Multimedia Technology)

Effective from June-2020

Credits : 2 **Lectures per week : 2**

University examination duration: 3 Hours **All units carry equal weightage**

Unit 1	**Introduction** − Introduction to Multimedia Digital Media : audio, text, graphics, animation, video − Types of Multimedia Applications Multimedia : hardware/software essentials − Multimedia Application
Unit 2	**Working with Audio, Text and Graphics** − Multimedia audio : introduction to digital audio and sound card composition and connectivity, Music synthesis, digital audio playback − Digital Audio : editing process , need and editing terminologies − Multimedia text : introduction, Text as a part of Multimedia Project, Text designing basics ,effects of poor text content design and display design and parameters that control text design, hypermedia, hypertext − Multimedia graphics : introduction, basic concepts of colour displays, Color depth, Resolution, colour monitors and their parameters
Unit 3	**Working with Video and Animation** − Multimedia video : introduction, Role of digital video in multimedia projects, full motion and full screen videos, digital video production techniques – video shooting , video capture process, video post production − Multimedia Animation: introduction, Need for animation , classifications, two-dimensional animation and three dimensional animation technology − Animation development process: Phase 1 and Phase 2
Unit 4	**Multimedia Project** − Multimedia project design concepts – introduction, conceptualization and development, data gathering , developing media content , Designing interface − Multimedia authoring: Introduction, multimedia programming vs. multimedia authoring, authoring methodologies, characteristics of authoring tools, commercial authoring tools.

REFERENCE BOOKS:

1. Multimedia Magic. (Revised and updated Second edition) By S. Gokul, BPB Publications, 2005.
2. Introduction to Multimedia : By Ana Weston Solomon, Tata McGraw-Hill Publishing Company Limited, 2005