

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 <ul style="list-style-type: none">- 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 <ul style="list-style-type: none">- 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 <ul style="list-style-type: none">- 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	<p>Query, Subquery, Joins, Transaction Management and Reporting through SQL*Plus</p> <ul style="list-style-type: none"> – 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
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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. Parthasarthy 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 <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none">- Architecture of Internet, Intranet, Extranet- Characteristics of internet, Intranet and extranet- Application of Intranet- Application of extranet
Unit 2	Introduction to E-Commerce <ul style="list-style-type: none">- 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 <ul style="list-style-type: none">- 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 <ul style="list-style-type: none">- 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 <ul style="list-style-type: none">– 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 <ul style="list-style-type: none">– 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 <ul style="list-style-type: none">– 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 <ul style="list-style-type: none">– 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

SARDAR PATEL UNIVERSITY
B.Sc. Computer Science VI Semester
Course: US06CCSC21
(Object Oriented Programming Using Java)
Effective from June-2020

Credits : 4

Lectures per week: 4

University examination duration: 3 Hours

All units carry equal weightage

Unit 1	Introduction <ul style="list-style-type: none">– History of Java, features, the Java environment, the Java Virtual Machine (JVM)– Structure of a Java program, a simple Java program, implementing a Java program– Tokens, comments, constants, variables and data types– Scope of variables, type casting– Operators: arithmetic, relational, logical, assignment, increment/decrement, conditional, ternary operator & special operators– Decision making: if statement, if...else statement, nesting of if...else, the else if ladder, switch statement– Looping: while, do...while, for, for each loop jumps in loops, labeled loops
Unit 2	Arrays, Classes, Objects, Interfaces and Inheritance <ul style="list-style-type: none">– Arrays: one, two dimensional arrays– Defining a class, members of a class: variables and methods, creating objects, constructors, accessing class members– Static members v/s instance members– Introduction to inheritance, super keyword– Interfaces: Introduction, definition, extending, implementing & accessing– Final variables, methods and classes, abstract methods and classes– Introduction to method overloading and overriding
Unit 3	Exception Handling, I/O Management and Packages <ul style="list-style-type: none">– Managing errors & exceptions: introduction, types of errors, exceptions, syntax of exception handling construct, multiple catch statements, the finally clause, defining and throwing user-defined exceptions, the throw statement– Managing I/O files: introduction, concept of streams, Character stream classes– Introduction to the concept of package, Java API packages, using the System package– Using java.lang (String, Math)
Unit 4	Applet Programming & JDBC <ul style="list-style-type: none">– Applet architecture and skeleton– java.awt package (Button, CheckBox, CheckBoxGroup, Choice, Color, Label, List, TextArea, TextField)– HTML applet tag, display techniques (DrawString, Lines, Rectangle, Ellipses, Circles, Arcs, Polygons, Color)– Introduction to event handling– Introduction to JDBC, types of drivers– java.sql package– Retrieving, inserting, deleting and updating data though Java

REFERENCE BOOKS:

1. Programming with Java- A Primer by E. Balaguruswami, 3rd Edition, TMH Publ.
2. The Complete Reference – Java 2 7th Edition Herbert Schildt. TMH Publication
3. Saba Zame, Handbook of Object technology, CRC Press, Washington DC, 1999
4. Mary Campion and Kathy Walrath, Java tutorial, Second Edition, Addison Wesley Pun. 1998.
5. Java 2 Programming Black Book, Steven Holzner

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science VI Semester

Course: US06CCSC22

(PHP using MySQL)

Effective from June-2020

Credits : 4

Lectures per week: 4

University examination duration: 3 Hours

All units carry equal weightage

Unit 1	PHP Programming Concepts -1 <ul style="list-style-type: none">- Introduction to open source- Advantage and capabilities of open source- Introduction to apache- Introduction to PHP: features, adding PHP to HTML- PHP Variables- Static & global variables- GET & POST method- PHP Operators- Conditional Structure & Looping Structures- User Defined Functions- Arrays- Strings and its functions
Unit 2	PHP Programming Concepts-2 <ul style="list-style-type: none">- Site structure and basics of web site development using PHP- PHP and OOP templates- Error Handling- Authentication- Cookies and Session Management- Browser detection- Sending MIME Mail Message with Mail_mime, smtp
Unit 3	Working with images, pdf files, ajax and XML <ul style="list-style-type: none">- Creating and Manipulating images- Using Text in Images- Creating database driven graph- Saving and building on existing image.- Generate PDF file.- PHP with XML- PHP with Ajax
Unit 4	Accessing Database <ul style="list-style-type: none">- Working with MySQL using PhpMyAdmin- PHP-MySQL Connectivity- PHP-MySQL Functions

REFERENCE BOOKS:

1. Essential PHP Tools Modules, extensions and Accelerators–David Sklar–APRESS (SPD)
2. PHP advance for the World Wide Web – Larry Edward Ullman – peachpit press
3. Advance PHP for Web professionals – Christopher Cosentino – Pearson education
4. Expert PHP 5 Tools – Dirk Merkel – PACKT(SPD)
5. Learning PHP 5 – David Sklar –O’Reilly (SPD)
6. Beginning PHP 5.1 For Begginers – Iyan Byross, Sharanam Shah- The Team (SPD)

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science VI Semester

Course: US06CCSC23

(Python Programming)

Effective from June-2020

Credits : 4

Lectures per week : 4

University examination duration: 3 Hours

All units carry equal weightage

Unit 1	Introduction & Basic Concept of Python <ul style="list-style-type: none">- Python Introduction- Python Features- Python Applications- Data type, Variable, keywords, literals, operators, comments- Flow control statements. If, Switch, while, for, do...while- Break, continue and pass statements
Unit 2	Inbuilt & UDF Functions <ul style="list-style-type: none">- Strings (String Operations & Functions)- Lists (List Operations & Functions)- Tuples (Tuple Operations & Functions)- Sets (Set Operations & Functions)- Dictionary (Dictionary Operations & Functions)- Functions (Built-in, User-define, Lambda)
Unit 3	File I/O Handling <ul style="list-style-type: none">- FILE & I/O Handling- Modules- Exceptions- Date- Regex- Read & Write CSV file.- Use of different kind of modules
Unit 4	Working with Database <ul style="list-style-type: none">- Environment Setup- Database Connection- Creating new Database- Creating Tables- Working with table (Insert operations, Read operations, Update Operations, Join Operations)- Transaction

REFERENCE BOOKS:

1. Paul A. DeBarry: Head First Python, 2010, O'Reilly Media, Inc.
2. Martin C. Brown: The Complete Reference Python, McGraw Hill
3. David M. Beazley: Python Essential Reference, Pearson Addison-Wesley Professional
4. Python Tutorial/Documentation www.python.or 2010
5. <http://docs.python.org/3/tutorial/index.html>
6. <http://www.javapoint.com/python-tutorial>

Unit 4	The Concepts of a System, System Analysis and Development Life Cycle (SDLC) <ul style="list-style-type: none">- The concept of a system- The elements and characteristics of a system- Types of systems- Meaning of systems analysis- Role of a systems analyst- SDLC - Introduction- Stages of SDLC.
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REFERENCE BOOKS:

1. An Integrated Approach to Software Engineering: By Pankaj Jalote, Narosa Publishing House, Second Edition, 1997
2. Software Engineering a practitioner's approach: By Roger S. Pressman, Tata McGraw-Hill, 5th Edition
3. Software Engineering Fundamentals, by Richard Fairley, Tata McGraw Hill
4. Software Engineering by Ian Sommerville, Addison-Wesley, 5th Edition, 2000
5. S. Parthasarthy & B. W. Khalkar: System Analysis & Design, 1st Edition, Master Ed. Cons., Nashik.
6. James A. Sen: Analysis & Design of Information System 2nd Edition, McGraw-Hill Int.

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science

VI Semester

Course: US06CCSC25

(Practical)

Effective from June-2020

Credits : 6

No. of laboratory hours per week : 12

University examination duration : 6 Hours

Part-I: Practical based on US06CCSC21

Part-II: Practical based on US06CCSC22

Part-III: Practical based on US06CCSC23

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science

VI Semester

Course: US06DCSC26

(Artificial Intelligence)

Effective from June-2020

Credits : 2

University examination duration: 2 Hours

Lectures per week : 2

All units carry equal weightage

Unit 1	Introduction <ul style="list-style-type: none">- Concepts and Definitions of AI- Brief history of AI- AI and related fields
Unit 2	Expert Systems <ul style="list-style-type: none">- Introduction- Characteristic features of Expert System- Representing and Using Domain knowledge- General Structure of Expert Systems- Expert System Shell- Advantages and Disadvantages of Expert system
Unit 3	Introduction to AI techniques and Application Areas-I <ul style="list-style-type: none">- Introduction to Basic search strategies: Some examples and Classification- Introduction to Heuristic Search technique: Best First Search- Using Predicate Logic- Representing simple facts in logic
Unit 4	Introduction to AI techniques and Application Areas-II <ul style="list-style-type: none">- Introduction to Fuzzy logic- Introduction to various application areas of AI like:<ul style="list-style-type: none">- Natural Language Processing, Game Playing, Robotics- The Concepts of System, Systems Analysis and Systems Development

REFERENCE BOOKS:

1. Elaine Rich: Artificial Intelligence, McGraw Hill, 2001.
2. Patterson, Dan W.: Introduction to Artificial Intelligence, Prentice Hall of India (PHI)
3. R. Akerkar: Introduction to Artificial Intelligence, PHI, 2005
4. S. Russell and P. Norvig, Modern Approach to Artificial Intelligence, Prentice Hall of India Ltd., 2006.
5. George Luger, Artificial Intelligence, 5th Edition, Addison Wesley, 2004.

SARDAR PATEL UNIVERSITY

B.Sc. Computer Science

VI Semester

Course: US06DCSC27

(Enterprise Resource Planning)

Effective from June-2020

Credits : 2

Lectures per week : 2

University examination duration: 2 Hours

All units carry equal weightage

Unit 1	Introduction to ERP <ul style="list-style-type: none">- Enterprise: introduction, business modeling, integrated data model, integrated management information- Enterprise Resource Planning (ERP): Introduction, history. Basic concepts of ERP- Risks (All types risks in brief)
Unit 2	ERP & Related Technologies <ul style="list-style-type: none">- Benefits of ERP.[just an overview] Business Process Reengineering (BPR)- Data warehousing, data mining and Online Analytical Processing (OLAP)- Product Life Cycle Management (PLM)- Supply Chain Management (SCM)- Customer Relationship Management (CRM)
Unit 3	ERP – Selection and Implementation <ul style="list-style-type: none">- ERP Package Selection- ERP Implementation Life Cycle.- Introduction Objective Phases of implementation
Unit 4	ERP –Operation, Maintenance & Evaluation <ul style="list-style-type: none">- Operation of the ERP system- ERP Maintenance Phase- Measuring performance of ERP- Functional modules of ERP software

REFERENCE BOOKS:

1. Alexis Leon: Enterprise Resource Planning, Tata McGraw-Hill, New Delhi 2nd editions