MATS SCHOOL OF INFORMATION TECHNOLOGY

SYLLABUS

For

One Year Diploma Course

Diploma in Computer Application

(DCA)

2025-26

(Semester Based Course)

Programme Outcomes:

PO1: Understand basic concepts of computers, operating systems, and IT.

PO2: Write and run simple programs using basic programming skills.

PO3: Create and manage databases using DBMS and RDBMS tools.

PO4: Use office applications to prepare documents, spreadsheets, and presentations.

PO5: Design simple web pages and understand basic computer networking.

PO6: Communicate clearly in both spoken and written forms.

PO7: Apply practical skills through labs and projects to solve simple IT problems.

PO8: Show good ethics, adapt to new technologies, and continue learning.

SYLLABUS **PROGRAM: DCA SEMESTER: I**			
Course Code: DCA DSC-101	**Credit:04**	**Course: IT Fundamentals**	**L:02|T:01|P:00**

No.	Module Description	
Module 1:	**Computer Organization**	
	Unit 1.1:	Introduction of Computers, Characteristics of computers
	Unit 1.2:	Evolution of computer
	Unit 1.3:	Input unit, Output unit and Storage unit
	Unit 1.4:	Arithmetic Logic Unit (ALU), Control Unit (CU), Central Processing Unit (CPU)
	Unit 1.5:	System concepts
	Unit 1.6:	Classification of computers
	Unit 1.7:	Types of Memory: RAM, ROM, PROM, EPROM, EEPROM, Cache
Module 2:	**Digital System and Boolean Algebra**	
	Unit 2.1:	Overview of digital systems and their application, number system: representation and conversion
	Unit 2.2:	Binary coded decimal (BCD)representation
	Unit 2.3:	Boolean algebra fundamentals
	Unit 2.4:	Basic Theorem and properties of Boolean algebra
	Unit 2.5:	Boolean function
	Unit 2.6:	Canonical and standard forms
Module 3:	**Gate-level Minimization**	
	Unit 3.1:	Introduction
	Unit 3.2:	The map method

	Unit 3.3:	Karnaugh maps(K-maps) for simplifying Boolean expressions.
	Unit 3.4:	product of sums simplification
	Unit 3.5:	Don't care condition
	Unit 3.6:	NAND and NOR implementation
Module 4:	**Computer Software**	
	Unit 4.1:	Introduction to Software
	Unit 4.2:	Relationship between Hardware and Software
	Unit 4.3:	Types of Software
	Unit 4.4:	Logical System Architecture
	Unit 4.5:	Firmware, Middleware
	Unit 4.6:	Pre-written Software, Customized Software
	Unit 4.7:	Developing Customized Software
	Unit 4.8:	Software development Life cycle
	Unit 4.9:	Software Engineering
	Unit 4.10:	Introduction to Operating System, Functions of an operating systems
Module 5:	**Cyber Security**	
	Unit 5.1:	Cyber security: Introduction, Significance, Working of Cyber Security, Challenges, Cyber Laws
	Unit 5.2:	Types of cyber-attacks: malware, Phishing, DDoS, Password, Man in the middle, SQL Injections, Prevention from Cyber
	Unit 5.3:	Future Trends in Cyber security: Artificial Intelligence and Machine Learning, Cloud Security, Internet of Things (IoT) Security, Quantum Security, 5G Security.
	Unit 5.4:	Emerging Trends in Digital Media: Influencer Marketing, Omnichannel Marketing, Artificial Intelligence, Deep fake videos, Video Marketing, Metaverse, Chatbots.

Text Books/Resources:

1. Pradeep K. Sinha, "Computer Fundamentals":TB#1
2. E Balagurusamy , "FUNDAMENTALS OF COMPUTERS", Tata McGraw Hill :TB#2
3. M. Morris Mano, "Computer System Architecture":TB#3

Reference Books/Resources

1. https://www.researchgate.net/publication/258339295_FUNDAMENTALS_OF_COMPUTER_STUDIES
2. https://www.geeksforgeeks.org/computer-fundamentals-tutorial/
3. https://www.simplilearn.com/tutorials/cyber-security-tutorial/types-of-cyber-attacks :RB#4
4. https://www.zenarmor.com/docs/network-security-tutorials/future-trends-in-cybersecurity :RB#5
5. https://emeritus.org/in/learn/digital-marketing-trends/:RB#6

SYLLABUS

PROGRAM: DCA SEMESTER: I

Course Code: DCA DSC-102	**Credit:04**	**Course: Programming Fundamentals**	**L:02|T:01|P:00**

No.	Module Description	
Module 1:	**Algorithm, Flow Chart and Programming languages**	
	Unit 1.1:	Introduction of algorithm and flowchart
	Unit 1.2:	Type of software and programming languages
	Unit 1.3:	Introduction to C: Program structure, Per processor
	Unit 1.4:	Derivatives, Header files
	Unit 1.5:	Token, Data Type, Format Specifier, Operators
Module 2:	**Control Statements, Array and String**	
	Unit 2.1:	Control Statements: Definition and types
	Unit 2.2:	Branching, Looping, Jumping Statement and its types
Module 3:	**Array and String**	
	Unit 3.1:	One dimensional, Two dimensional and Multidimensional Array
	Unit 3,2:	Character Array: Initialization, Reading, writing
	Unit 3.3:	String Manipulation functions
Module 4:	**Function**	
	Unit 4.1:	Function: Introduction, types of functions
	Unit 4.2:	Function: Nested function, Recursion
	Unit 4.3:	Passing array as a function parameter
Module 5:	**File Handling**	
	Unit 5.1:	Introduction of file concept: Opening, closing
	Unit 5.2:	Input/output Operation in file
	Unit 5.3:	Error Handling during I/O Operation
	Unit 5.4:	Random Access file

Text Books/Resources:

1. EBalaguruSwami,"ProgramminginANSI",TataMcGrawHills:**TB#1**
2. KRVenugopalandSRPrasad,"MasteringinC",TataMcGrawHills:**TB#2**

Reference Books/Resources

1. Yashavant Kanetkar,"LetUsC",BPB Publication
2. https://www.javatpoint.com/c-programming-language-tutorial
3. https://www.w3schools.com/c/

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PROGRAM: DCA SEMESTER: I

Course Code: DCA DSC-104	**Credit:04**	**Course: Database Management System**	**L:03|T:01|P:00**

No.	Module Description	
Module 1:	**Introduction to Database Management System**	
	Unit 1.1:	Introduction and purpose of database
	Unit 1.2:	View of Data: Data Abstraction, Instances and Schemas, Data Models
	Unit 1.3:	Database Languages: DDL and DML
	Unit 1.4:	Database Architecture: Two-tier, Three-tier
	Unit 1.5:	Database Users and Administrator: Functions and Roles
	Unit 1.6:	Introduction to Data Mining, Data warehouse, Big Data, Data Analytics
Module 2:	**Data Modeling and Database Design**	
	Unit 2.1:	Design Process
	Unit 2.2:	E-R Model
	Unit 2.3:	Constraints
	Unit 2.4:	E-R Diagram
	Unit 2.5:	Weak and Strong Entity Set
Module 3:	**Relational Database Design**	
	Unit 3.1:	Extended E-R Features : Generalization and Specialization
	Unit 3.2:	Constraints on Specialization
	Unit 3.3:	Relational Model Structure
	Unit 3.4:	Database Schema
	Unit 3.5:	Keys: Super, Candidate, Primary, and Foreign key
	Unit 3.6:	Schema Diagram
	Unit 3.7:	Conversion of E-R to Relational Model
PRACTICAL MODULE		
Module 4:	**Managing Database and Table**	
	Unit 4.1:	Select, Create and Drop Database
	Unit 4.2:	Create, Rename, Alter Table, Truncate and Drop Table
	Unit 4.3:	Data Types: BIT, BOOLEAN, CHAR, VARCHAR, DATE, DATETIME, DECIMAL

	Unit 4.4:	Insert, Update and Delete Records
	Unit 4.5:	Constraint: Primary Key, Foreign Key, UNIQUE Constraint, NOT NULL Constraint, DEFAULT Constraint, CHECK Constraint
Module 5:	**Operators and Functions**	
	Unit 5.1:	SELECT, ORDER BY, WHERE, SELECT DISTINCT
	Unit 5.2:	Operators: AND, OR, IN, BETWEEN, LIKE, LIMIT, IS NULL
	Unit 5.3:	Numeric, String and Date functions
	Unit 5.4:	Joins: INNER JOIN, LEFT JOIN, RIGHT JOIN, SELF JOIN
	Unit 5.5:	Aggregate Functions: GROUP BY, HAVING, MIN (), MAX (), AVG (), SUM (), COUNT ()

Text Books/Resources:

1. Henry F. Korth, “Database System Concepts”,TataMcGrawHills
2. IvanBayross,MySQL5.1forProfessionals, SPD

Reference Books/Resources

1. ElmasriandNavathe,“FundamentalsofDatabaseSystems”,PearsonEducation.
2. ThomasConnollyandCarolynBegg,“DatabaseSystems,APracticalApproachto Design Implementation and Management", Pearson Education
3. MySQL Referencehttps://www.mysqltutorial.org/
4. MySQL Reference Manual-https://dev.mysql.com/doc/refman/8.0/en/

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PROGRAM: DCA SEMESTER: I

Course Code: SEC 001	**Credit:02**	**Course: Office Automation**	**L:00|T:00|P:02**

No.	Module Description	
Module 1:	**Word Processing**	
	Unit 1.1:	Working With Document: Opening, Saving and Editing Files, Inserting, Deleting Files
	Unit 1.2:	Margins: Converting Files to Different Format Using Tools Bar
	Unit 1.3:	Page Style, Alignment -Indents, Line Space, Border and Shading
	Unit 1.4:	Header and Footer Setting
	Unit 1.5:	Drawing: Inserting Clip Arts Pictures/Files Etc.
	Unit 1.6:	Word Completion: Spell Checks
	Unit 1.7:	Mail Merging
Module 2:	**Spread Sheet**	
	Unit 2.1:	Spread Sheet and Its Applications
	Unit 2.2:	Working With Spreadsheet: Opening, Saving, File Setting
	Unit 2.3:	Spreadsheet Addressing: Rows, Columns and Cells, Referring Cells
	Unit 2.4:	Inserting Data: Insert Cells, Columns, Rows and Sheets
	Unit 2.5:	External Files: Frames Clipart, Pictures etc.
	Unit 2.6:	Formula Tab
Module 3:	**Presentation**	
	Unit 3.1:	Introduction To Presentation: Opening New Presentation
	Unit 3.2:	Selecting Presentation Layout
	Unit 3.3:	Adding Text to the Presentation
	Unit 3.4:	Header And Footer
	Unit 3.5:	Slide Layout
	Unit 3.6:	Adding Graphics to the Presentation, Setting Animation and Transition Effect
Module 4:	**HTML Basics**	
	Unit 4.1:	Introduction Of HTML, Elements Of HTML
	Unit 4.2:	Attributes, Headings, Paragraph, Styles Of HTML
	Unit 4.3:	CSS, Tables
	Unit 4.4:	HTML Class, Id

	Unit 4.5:	HTML Responsive
	Unit 4.6:	HTML Forms

Text Books/Resources:

1. Top help topics – Microsoft Support
2. https://www.w3schools.com/html/

Reference Books/Resources

SYLLABUS PROGRAM: DCA SEMESTER: I			
Course Code: AEC 001	**Credit:02**	**Course: Communication Skills**	**L:01|T:01|P:00**

No.	Module Description	
Module 1:	**Basics of Communication**	
	Unit 1.1:	Communication: An Introduction
	Unit 1.2:	Definition and Scope
	Unit 1.3:	Process of Communication
	Unit 1.4:	Barriers to Communication
	Unit 1.5:	Types of Communication
Module 2:	**Writing Skills**	
	Unit 2.1:	Letter Writing- Formal and Informal
	Unit 2.2:	CV, Email, Message
	Unit 2.3:	Minutes, Report Writing
	Unit 2.4:	Notice, Memoranda
Module 3:	**Reading Skills**	
	Unit 3.1:	Types of Readings
Module 4:	**Listening Skills**	
	Unit 4.1:	Effective listening
	Unit 4.2:	Barriers to listening
Module 5:	**Speaking Skills**	
	Unit 5.1:	Introduction to Soft Skills
	Unit 5.2:	Personality Development
	Unit 5.3:	Time Management/leadership Skills
	Unit 5.4:	Interviews/ Group Discussion/Presentation Skills
	Unit 5.5:	Short Speech

Text Books/Resources:

1. Brown, Ralph: Making Business Writing Happen: A Simple and Effective Guide to Writing Well. Sydney: Allen and Unwin,2004.
2. Buscemi,SantiandCharlotteSmith,75ReadingsPlus.Second Edition New York: McGraw-Hill,1994.

3. Mohan Krishna C Banerji ,Meera :Developing Communication Skills. New Delhi: Macmillan India,1990.

SYLLABUS PROGRAM: DCA SEMESTER: II			
Course Code: DCA DSC-201	**Credit:04**	**Course: Fundamental of Computer Networking and web Designing**	**L:03|T:01|P:00**

No.	Module Description	
Module 1:	**Introduction to Computer Network**	
	Unit 1.1:	Data Communications: Components, Data Representation, Data Flow (Simplex, Half-Duplex, Full-Duplex)
	Unit 1.2:	Types of Networks (LAN, MAN, WAN), Network Topologies (Bus, Star, Ring, Mesh)
	Unit 1.3:	OSI Model and TCP/IP Model
	Unit 1.4:	Addressing: Physical Addresses (MAC), Logical Addresses (IP), Port Addresses
	Unit 1.5:	Network Devices (Hub, Switch, Router, Bridge, Gateway)
Module 2:	**Introduction to Web Design**	
	Unit 2.1:	WWW, Working of Websites
	Unit 2.2:	Web designing process, UX AND UI
	Unit 2.3:	Front End, Back End, Client and Server Scripting Languages
	Unit 2.4:	Responsive Web Designing
	Unit 2.5:	Types of Websites (Static and Dynamic Websites)
Module 3:	**HTML Concepts**	
	Unit 3.1:	Introduction to HTML, HTML Editor, HTML Basics
	Unit 3.2:	HTML Elements and Attributes
	Unit 3.3:	Heading, Types of Heading, Paragraphs, Style
	Unit 3.4:	Formation, Quotations, Comments
	Unit 3.5:	Links, Colors, Images
	Unit 3.6:	List, Tables
	Unit 3.7:	Forms, Form Elements, Input types, Text Input, Text Area, Dropdown, Radio buttons, Check boxes, Submit and Reset Buttons.
Module 4:	**CSS Concepts**	
	Unit 4.1:	Introduction to CSS, Types of CSS
	Unit 4.2:	Selectors, Comments, Colors
	Unit 4.3:	Background, Borders, Margins, Padding, Height/Width

	Unit 4.4:	Box Model, Outline, Text, Fonts, Icons
	Unit 4.5:	Link, Lists, Tables, Displays
	Unit 4.6:	Positions, Overflow, Float, inline-block
	Unit 4.7:	CSS Menu Design CSS Image Gallery
Module 5:	**Web Publishing and Browsing**	
	Unit 5.1:	Overview, SGML (Standard Generalized Markup Language)
	Unit 5.2:	Web hosting Basics, Components of Web Publishing
	Unit 5.3:	Web Page Design Considerations and Principles
	Unit 5.4:	Search and Meta Search Engines
	Unit 5.5:	WWW, Browser, HTTP, Publishing Tools

Text Books/Resources:

1. Andrew S. Tanenbaum, "Computer Networks" , 5th Edition, Person Publication : TB#1
2. IvanByross,"WebEnabledCommercialApplicationDevelopmentUsing. HTML, JavaScript, DHTML and PHP ", BPB Publication#TB2
3. https://www.w3schools.com/
4. https://www.tutorialspoint.com/index.htm

Reference Books/Resources

1. James Kurose, Keith Ross, "Computer Networking: A Top-Down Approach", 7th Edition, Pearson Publication.
2. DTEditorial,"WebTechnology:BlackBook",dreamteach
3. ThomasA.Powell,"TheCompleteReferenceHTML&CSS",McGrawHill

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PROGRAM: DCA SEMESTER: II

Course Code: DCA DSC-203	**Credit:04**	**Course: Relational Database Management System**	**L:02|T:01|P:00**

No.	Module Description	
Module 1:	**Relational Database Design**	
	Unit 1.1:	E.F. Codd's Rule
	Unit 1.2:	Functional dependency, Armstrong's Inference rules
	Unit 1.3:	Decomposition of Relations: Lossless Join and Dependency Preservation Property
	Unit 1.4:	Normalization: First, Second and Third Normal Form
	Unit 1.5:	Denormalization
Module 2:	**Procedural SQL**	
	Unit 2.1:	Compound statements and labels
	Unit 2.2:	Overview of Control and Iterative statements: IF,CASE, LEAVE, WHILE, LOOP
	Unit 2.3:	Cursors: OPEN, CLOSE and FETCH
	Unit 2.4:	User Defined Function: Need, RETURN statement
	Unit 2.5:	Stored Procedure: Need and usage
Module 3:	**Triggers**	
	Unit 3.1:	Triggers and their usage
	Unit 3.2:	Trigger Activation
	Unit 3.3:	BEFORE and AFTER trigger
	Unit 3.4:	COMMIT, ROLLBACK, SAVEPOINT
Module 4:	**Transaction Processing**	
	Unit 4.1:	Transaction: Introduction, Transaction Model
	Unit 4.2:	Properties of Transactions
	Unit 4.3:	Transaction isolation, Schedules: Serial, Non-Serial Schedules
	Unit 4.4:	Serializability, Conflict Serializability
Module 5:	**Concurrency Control**	
	Unit 5.1:	Concurrent Transactions: Purpose
	Unit 5.2:	Concurrency Control Protocol: Two Phase Locking(2PL) Protocol
	Unit 5.3:	Strict 2PL, Conservative 2PL
	Unit 5.4:	Deadlock and Starvation

	Unit 5.5:	Deadlock Detection and Resolution: Wait-for graph

Text Books/Resources:

1. Henry F. Korth, “Database System Concepts”, TataMcGrawHills
2. IvanBayross,MySQL5.1forProfessionals, SPD

Reference Books/Resources

1. ElmasriandNavathe,“FundamentalsofDatabaseSystems”,PearsonEducation.
2. ThomasConnollyandCarolynBegg,“DatabaseSystems,APracticalApproach to Design Implementation and Management", PearsonEducation
3. MySQL Referencehttps://www.mysqltutorial.org/
4. MySQL Reference Manual -https://dev.mysql.com/doc/refman/8.0/en/

SYLLABUS

PROGRAM: DCA SEMESTER: II

Course Code: DCA DSC-205	**Credit:02**	**Course: Operating System Concepts**	**L:02|T:00|P:00**

No.	Module Description	
Module 1:	**Definition to Operating System**	
	Unit 1.1:	Definition and function of an operating system
	Unit 1.2:	Types of operating system: batch, time-sharing, real-time, distributed, embedded
	Unit 1.3:	System call and interface
	Unit 1.4:	The role of OS in a computing environment
	Unit 1.5:	OS structure: Monolithic, microkernel, hybrid architectures
Module 2:	**Operating System Services**	
	Unit 2.1:	Process management and scheduling
	Unit 2.2:	Memory management
	Unit 2.3:	File systems
	Unit 2.4:	I/O management
	Unit 2.5:	Device drivers
	Unit 2.6:	Security and protections
Module 3:	**Processes and Threads**	
	Unit 3.1:	Concept of processes, threads, and programs
	Unit 3.2:	Process state model
	Unit 3.3:	Process scheduling and CPU scheduling algorithms
	Unit 3.4:	Context switching
	Unit 3.5:	Threads: user vs kernal threads, thread libraries
Module 4:	**Linux OS**	
	Unit 4.1:	Introduction to Linux
	Unit 4.2:	Linux File System & Directory Structure
	Unit 4.3:	Linux commands: Basic Linux Commands, User & Group Management, Process

		Management
	Unit 4.4:	Shell scripting: Basics of Shell Scripting, Variables, Loops, and Conditional Statements, Creating and Executing Scripts
	Unit 4.5:	VI Editor

Text Books/Resources:

1. Abraham Silberschatz, Peter B Galvin, and Gerg Gagne – "Operating System Concepts", Wiley.