SYLLABUS: TGT Computer Science in DOE

1. Mathematics – I, II, III, IV.
2. Business Communication, Business Organization and Management, Writing.
3. Computer Basics and P.C. Software.
4. Programming with C, Data Structures using C, C++ Programming.
5. Fundamentals of Information Technology.
6. Basis of Physics.
7. Digital Electronics.
8. Database Management System.
9. Computer Architecture.
10. Front End Designed Tools.
11. Financial Accounting.
12. Object/Computer Oriented Programming/Numerical Techniques.
13. Software Engineering.
14. Java Programming and website design.
15. Operating Systems.
16. Business Economics.
17. Computer Networks.
18. .net programming.
19. Linux Environment.
20. E-Commerce.
21. Design and analysis of algorithms.
22. Computer Network Security.
23. Management Information System.
24. Mobile Computing.
25. Computer Graphics & Multimedia Applications – Graphics, Graphics Hardware, Clipping, Curve & Surfaces, Solid Modeling.
26. Internet Programming – Web Server, CSS, Event Model, Filter & Transitions, Data Binding with Tabular Data Control, PWS Setup, Publishing Information/Internet Information Server, DTD's using XML with XTML and CSS, XML parsers.
27. Knowledge Management & New Economy.
28. Foundation Course in English.
29. Problem Solving & Programming.
30. Statistical Techniques – Descriptive Statistics, Probability concepts, Probability Distributions, Inference.
31. TCP/Protocols.
32. Interpolation.

Syllabus for TGT Computer Science in NDMC

Computer Systems and Organization	• Basic Computer Organization: Introduction to the computer system, hardware, software, input device, output device, CPU, memory (primary, cache and secondary), units of memory (Bit, Byte, KB, MB, GB, TB, PB) • Types of software: system software (operating systems, system utilities, device drivers), programming tools and language translators (assembler, compiler & interpreter), application software • Operating system (OS): functions of operating system, OS user interface • Boolean logic: NOT, AND, OR, NAND, NOR, XOR, truth table, De Morgan's laws and logic circuits
Computer Systems Architecture	• System buses • Internal Memory - Computer Memory System RAM/ROM • Input and Output Devices - External Devices, I/O Modules, Programmed I/O, Interrupt- Driven I/O, Direct Memory Access, I/O Channels and Producers, External Interface
Operating Systems	• Introduction • Operating System Organization • Device Management • Process Management • Scheduling • Synchronization Principles • Deadlocks • Memory Management • File Management
Computational Thinking and Programming	• Introduction to problem solving: Steps for problem solving (analysing the problem, developing an algorithm, coding, testing and debugging). representation of algorithms using flow chart and pseudo code, decomposition

	• Familiarization with the basics of Python programming: Introduction to Python, features of Python, executing a simple "hello world" program, execution modes: interactive mode and script mode, Python character set, Python tokens (keyword, identifier, literal, operator, punctuator), variables, concept of l-value and r-value, use of comments • Knowledge of data types: number (integer, floating point, complex), boolean, sequence (string, list, tuple), none, mapping (dictionary), mutable and immutable data types
Society, Law and Ethics	• Digital Footprints • Digital society and Netizen: net etiquettes, communication etiquettes, social media etiquettes • Data protection: Intellectual Property Right (copyright, patent, trademark), violation of IPR (plagiarism, copyright infringement, trademark infringement), open source software's and licensing (Creative Commons, GPL and Apache) • Cyber-crime: definition, hacking, eavesdropping, phishing and fraud emails, ransom ware, preventing cyber crime • Cyber safety: safely browsing the web, identity protection, confidentiality, cyber trolls and bullying.
Computational Thinking and Programming – 2	• Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope) • Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths • Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text

	file.
Computer Networks	• Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET) • Data communication terminologies: concept of communication, components of data communication (sender, receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching) • Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiberoptic cable), Wireless media (Radio waves, Micro waves, Infrared waves) • Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)
Database Management	• Database concepts: introduction to database concepts and its need • Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key) • Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables,
Introduction to Computer System	• Introduction to computers and computing: evolution of computing devices, components of a computer system and their interconnections, Input/Output devices. • Computer Memory: Units of memory, types of memory – primary and secondary, data deletion, its recovery and related security concerns. • Software: purpose and types – system and application software, generic and specific purpose software.
HTML	• HTML - HTML/ DHTML, Basic Tags of HTML, Creating Links • Web Page Authoring Using HTML - Tables, From Tags

	• Document Object Model - Concept and Importance of Document Object Model, Dynamic HTML document and Document Object Model • Cascading Style Sheets (CSS) - Introduction to Cascading Style Sheet (CSS), Margins (all values) • Extensible Markup Language (XML) - Features & Structure of XML, Naming Rules, Element Content Models, Element Occurrence Indicators, Character Content, Developing a DTD, Viewing. • Active Server Pages (ASP) - Constants: String and Numeric; Data types: Integer, Floating-Point (Single, Double), String, Date, Boolean, Currency, Variant, Object;
Introduction to Python	• Basics of Python programming, Python interpreter – interactive and script mode, the structure of a program, indentation, identifiers, keywords, constants, variables, types of operators, precedence of operators • Dictionary: concept of key-value pair, creating, initializing, traversing, updating and deleting elements, dictionary methods and built-in functions: len(), dict(), keys(), values(), items(), get(), update(), clear(), del()
Database concepts and the Structured Query Language	• Database Concepts: Introduction to database concepts and its need, Database Management System. Relational data model: concept of attribute, domain, tuple, relation, candidate key, primary key, alternate key, foreign key. • Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, creating a database using MySQL, Data Types
Emerging Trends	• Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience (AR, VR), Robotics, Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities,
Data Handling using Pandas	• Introduction to Python libraries- Pandas, Matplotlib. • Data structures in Pandas – Series and Data

	Frames. • Series: Creation of Series from – dray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing. • Data Frames: creation – from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns: add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing;
Database Query using SQL	• Math functions: POWER (), ROUND (), MOD (). • Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR (), LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM (). • Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME ().
Introduction to Computer Networks	• Introduction to networks, Types of network: LAN, MAN, WAN. • Network Devices: modem, hub, switch, repeater, router, gateway • Network Topologies: Star, Bus, Tree, Mesh. • Introduction to Internet, URL, WWW, and its applications- Web, email, Chat, VoIP.
Societal Impacts	• Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act. • E-waste: hazards and management. • Awareness about health concerns related to the usage of technology.

Topics of syllabus-Teaching Education and Methodology:-

1. Learning & Teaching
2. Language across the curriculum
3. Understanding discipline and subject
4. Gender school and Society
5. Pedagogy of a school subject
6. Knowledge and curriculum
7. Assessment for learning
8. Creating an inclusive school
9. Childhood and growing up
10. Drama and Art in Education