Chhatrapati Shahu Ji Maharaj University (CSJMU)

(Formerly Kanpur University), Kanpur

Post Graduate Diploma in Computer Application (PGDCA)

Proposal Syllabus

(Based on NEP-2020)

Semester-I					
Code	**Paper Name**	**Internal**	**External**	**Total**	**Credit**
PGDCA-101	Computer Fundamentals & Operating System	25	75	100	4
PGDCA-102	Software Engineering	25	75	100	4
PGDCA-103	Internet and Web Fundamentals	25	75	100	4
PGDCA-104	Fundamentals of Programming (with Python)	25	75	100	4
PGDCA-105	MS-Office and DTP Tools (Lab-I)	25	75	100	2
PGDCA-106	Python Programming (Lab-II)	25	75	100	2
Semester-II					
Code	**Paper Name**	**Internal**	**External**	**Total**	**Credit**
PGDCA-201	Database Management System (DBMS)	25	75	100	4
PGDCA-202	Cyber Security and IT Laws	25	75	100	4
PGDCA-203	Emerging Trends in Computer	25	75	100	4
PGDCA-204	DBMS Lab with MySQL (Lab-I)	25	75	100	2
PGDCA-205	Major Project	50	150	200	6

Semester-I **PGDCA-101**

Computer Fundamentals & Operating System

Unit-I	**Computer:** Computer system concepts, Computer system characteristics, Capabilities and limitations, Block Diagram of elements of digital computer-their functions. Types of Computers-Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe, Super, Basic components of a computer system - Control unit, ALU, Input/output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory
Unit-II	**Hardware, Software** and relationship hardware and software, Needs and Types of Software - System Software, Application Software, System Software -Operating System, Utility Program, Assemblers, Compilers and Interpreter, Application Software and its Types.
Unit-III	**Representation of Data:** Binary, Octal, Hexadecimal, BCD, EBCDIC, ASCII Conversions. Simple Additions,Subtractions, Multiplications, Divisions (in Binary number). **Logic Gates-**AND, OR, NAND, NOR, Exclusive OR and NOR Truth tables.
Unit-IV	**Introduction:** Operating system and functions, Classification of Operating systems: Batch, Interactive, Time-sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multithreaded Systems, Operating System Structure, System Components, Operating System Services, Kernels, Monolithic and Microkernel Systems **Process Management:** Process Concept, Process States, Process Synchronization, Critical Section, Mutual Exclusion **CPU Scheduling:** Scheduling Concepts, Techniques of Scheduling, Preemptive and Non- Preemptive Scheduling

Semester-I **PGDCA-102**

Software Engineering

Unit-I	Introduction: System, Elements of System, Characteristics and Types of Systems Covers with Management Information System, System Analyst, Role Of System Analyst, Skills of System Analyst.
Unit-II	Tools or Techniques for Information Gathering in System Analysis: Interview, Questionnaires, Onsite Observation, Review Literature, Data Flow Diagram (DFD) And Its Symbols, Data Dictionary, Decision Table, Decision Tree, Structured English.
Unit-III	**Introduction:** Software Engineering, Characteristics, Need of Software Life Cycle Models, Waterfall, Prototype, And Spiral Models. Software Requirements Analysis & Specifications: Need for SRS, Characteristics of SRS. Basic Concept of Software Design, Design Process, Design Fundamentals. **Design Strategies:** Function Oriented Design, Object Oriented Design. Software Testing, Test Cases.
Unit-IV	**Software Maintenance:** Types of Software Maintenance, Software Maintenance Model: Quick Fix Model, Taute's Maintenance Model, Concept Of Software Reengineering & Software Reverse Engineering- Definition, Purposes And Objectives, Benefits.

Semester-I **PGDCA-103**

Internet and Web Fundamentals

Unit-I	**Internet and the World Wide Web:** What is the Internet? Introduction to internet and its applications, E-mail, telnet, FTP, ecommerce, video conferencing, E-Business, Internet service providers, domain name server, internet address, World Wide Web and its evolution, uniform resource locator (URL), browsers – internet explorer, Netscape navigator, opera, Firefox, chrome, Mozilla. Search engine,
Unit-II	**Basics:** HTML Document, Basic Structure of HTML, Syntax, HTML Tags and Attributes, Types of HTML Tags, Rules of nesting, Basic Tags (HTML Tag. Head Tag, Title Tag, Body Tags). **Page Formatting:** Adding a new Paragraph, adding a line break, insertinga blank space, changing page background, Div and Span tags **Text Formatting:** Html Headings, Formatting elements (<b> Bold text , Important text ,<i> Italic text , Emphasized text , <mark> Marked text, <small> Small text, <del> Deleted text, <ins> Inserted text, <sub> Subscript text, <sup> Superscript text),Comments, Horizontal Lines **Creating Lists:** Ordered List, Unordered Lists, Definition Lists **Others:** Images, Text Links, Image Links, opening a page in New Window or Tab, Linking to an area of same page, Introduction to Table Tags, Advantages and limitations of tables, Frames & Iframe, HTML Forms, XHTML
Unit-III	**Cascading Style Sheets:** Introduction, Benefits of CSS, CSS Syntax, CSS Implementation (inline, internal and external), CSS Selectors (ID Selectors, Class Selectors, Grouping Selectors, Universal Selectors, CSS Pseudo- classes), CSS properties (background-color, background-image, border- style, height, width, color, text-align, font-family, font-style, font-size, font-weight), Box Model in CSS(margin, border, padding)
Unit-IV	**Java Script**: Introduction, variables, data types, operators, control flow (if-else, for loop, while loop, do-while loop), Declaring Functions, calling functions with parameters, Adding JavaScript to Web Documents, JavaScript Objects, Document Object Models, HTML Events and calling Java Script functions on Events.

Semester-I **PGDCA-104**

Fundamentals of Programming (with Python)

Unit-I	**OOPs Concepts: I**ntroduction, class, object, attributes, inheritance, overloading, overriding, data hiding, polymorphism and etc.
Unit-II	**Introduction to Python Programming:** Overview of Python, Python interpreter/shell, Indentation, Identifiers and Keywords, Literals, Numbers and Strings, Operators (arithmetic operator, relational operator, Boolean operator, assignment, operator, ternary operator and bitwise operator) and Expressions.
Unit-III	**Control Structures:** Decision making statements- if, if-else, nested if-else,elif, Python loops- While Loop, For loop and Nested loops. Python control statements- break, continue, and pass. **Python Native Data Types:** Numbers, Lists, Tuples, Sets, Dictionary, Functions & Methods of Dictionary, Strings (in detail with their methods and operations).
Unit-IV	**Python Functions:** Functions, Advantages of Functions, Built-in Functions, User defined functions, Anonymous functions, Pass by valueVs. Pass by Reference, Recursion, Scope and Lifetime of Variables. **Python Modules:** Module definition, need of modules, creating a module, importing module, Path Searching of a Module, Module Reloading, Standard Modules, Python Packages.

Semester-I **PGDCA-105**

MS-Office & DTP Tools (Lab-I)

List of Practical

1. Create a document and apply different formatting options.
2. Design a Greeting Card using Word Art for different festivals.
3. Create your Bio-data and use page borders and shading.
4. Create a document and insert header and footer, page title etc.
5. To create a document, set the margins, orientation, size, column, water mark, page color and page borders.
6. Insert a table into the document.
7. Prepare a mark sheet of your class subjects.
8. Apply the creating, editing, saving, printing securing & protecting operations to an excel spreadsheets.
9. Prepare a bar chart & pie chart for analysis of five year results of your institute.
10. Work on the following exercise on a Workbook:
    a. Copy an existing Sheet
    b. Rename the old Sheet
    c. Insert a new Sheet into an existing Workbook
    d. Delete the renamed Sheet.
11. Prepare an Attendance sheet of 10 students for any 6 subjects of your syllabus. Calculate their total attendance, total percentage of attendance of each student & average of attendance.
12. Create a worksheet on Students list of any 4 faculties and perform following database functions on it.
    a. Sort data by Name
    b. Filter data by Class
    c. Subtotal of no. of students by Class.
13. Apply themes and layouts to power point slides and insert pictures, graphics, shapes, and tables into presentations.
14. In power point slide make use of adding transitions and animation
15. Working with master slides.
16. Create an excel worksheet and perform computations using available data and using mathematical functions chosen from menus.

Semester-I **PGDCA-106**

Python Programming Lab-II

List of Practical

Program 01: Write a program to demonstrate basic data type in python.

Program 02: Write a program to convert temperature in Celsius to Fahrenheit

Program 03: Write a Program for checking whether the given number is an even number or not.

Program 04: Write a program to find larger number between two numbers.

Program 05: Write a program to find smaller number between two numbers.

Program 06: Write a program to find smallest number among three numbers.

Program 07: Write a program to find greatest number among three numbers.

Program 08: Write a program to find factorial of a given number.

Program 09: Write a program to find given number is prime number or not.

Program 10: Write a program to print prime numbers between 1 to 100.

Program 11: Write a program to find given number is Armstrong or not.

Program 12: Write a program to print Armstrong numbers between 100 to 1000.

Program 13: Write a program to print Fibonacci series up n-terms.

Program 14: write a program to create, append and remove lists in python.

Program 15: write a program to demonstrate working with tuples in python.

Program 16: write a program to demonstrate working of strings in python.

Program 17: write a program to demonstrate working with dictionaries in python.

Semester-II **PGDCA-201**

Database Management System(DBMS) with SQL

Unit-I	**Introduction:** database system, advantages of database systems-redundancy, consistency, sharing, standards, integrity, security, conflicting requirements and data independence, concept of distributed database, DBMS, component. Architecture of database systems: schema, sub-schema; logical and conceptual view, data definition language (DDL), DML and database administrator.
Unit-II	Data models: relational model-structure, tuple, attributes, relation normalization, key-primary key, candidate key, alternate key. relational calculus & relational algebra-concepts, definition of union, set difference, Cartesian product -selection, intersection, quotient and join. Normal forms: -first, second, third normal forms, Boyce Code Normal Form(BCNF).
Unit-III	E-R Modeling, Normalization-Database Design, Entity, Attributes, and Entity sets, Relationship and Relation sets, ER Diagram, Features of ER Diagram. Database Security - Access Control.
Unit-IV	SQL Language, SQL Database object, SQL Data Types, DDL, DML, and DCL commands, Deleting data, Retrieving Data, Insertion of Data, Updating Data, Integrity constraint ,Keys, Creating and altering tables, and Views.

Semester-II **PGDCA-202**

Cyber Security and IT Laws

Unit-I	Need for Cyber Law, Cyber Jurisprudence at International and Indian Level, Jurisdictional Aspects in Cyber Law Issues of jurisdiction in cyberspace, Typesof jurisdictions, Minimum Contacts Theory, Sliding Scale Theory, Effects Test and international targeting, Jurisdiction under IT Act, 2000.
Unit-II	Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Ethics and Etiquettes of Cyber World, Cyber Pornography, Identity Theft & Fraud, Cyber Terrorism, Cyber Defamation, Right to Privacy and Data Protection on Internet, Concept of privacy, Threat to privacy on internet, Self-regulation approach to privacy.
Unit-III	Overview of Intellectual Property introduction and the need for intellectual property right (IPR), IPR in India – Genesis and Development IPR in abroad, Data Protection, Open Source Software, Macro economic impact of the patent system, Patent and kind of inventions protected by a patent, Patent document How to protect your inventions?, Granting of patent, Rights of a patent
Unit-IV	Copyright, Related Rights and Trademarks What is copyright? Latest editions of Designs, what is covered by copyright? How long does copyright last? Why protect copyright? What are related rights? Distinction between related rights and copyright? What is a trademark? Rights of trademark? What kind of signscan be used as trademarks? types of trademark, function does a trademark perform, How is a trademark protected?, How is a trademark registered?

Semester-II **PGDCA- 203**

Emerging Trends in Computer

Unit-I	Artificial Intelligence- Introduction to AI, Knowledge base system, Properties of AI, Software of AI, Organization working for AI, Fuzzy logic base machines, Workof cell and their classification. Data Encryption- Coding and Decoding techniques, First stage and second stage decoding, standard for data encryption. Image Processing- Introduction, Digital Image Processing, Various Phases of Image Processing.
Unit-II	Introduction, what is Machine Learning, Unsupervised Learning, Reinforcement Learning Machine Learning Use-Cases, Machine Learning Process Flow, Machine Learning Categories, Linear regression and Gradient descent
Unit-III	What is a Block chain? Basic ideas behind Block chain, how it is changing the landscape of digitalization, Uses of Block chain. Abstract Models for BLOCKCHAIN - GARAY model - RLA Model, what is Multichain? Objective of Multichain, Features of Multichain, Uses of Multichain, Process of mining in Multichain technology, Analyze Multichain platform, why it is better than other open platforms Block chain Architecture and Design: Basic crypto primitives: Hash, Signature) Hash chain to Block chain.
Unit-IV	Evolution of Cloud Computing, Cloud Computing Overview, Characteristics, Applications, Benefits, Challenges.

Semester-II **PGDCA- 204**

DBMS Lab with MySQL

List of Experiments

1. Creation of databases and execution of SQL queries.
2. Creation of Tables using MySQL: Data types, Creating Tables (along with Primary and Foreign keys).
3. Altering Tables and Dropping Tables.
4. Practicing DML commands- Insert, Select, Update, Delete.
5. Practicing Queries using ANY, ALL, IN, EXISTS, NOT, EXISTS, UNION, INTERSECT, and CONSTRAINTS, etc.
6. Practice Queries using COUNT, SUM, AVG, MAX, MIN, GROUP BY, HAVING, VIEWS Creation and Dropping.

Semester-II **PGDCA-205**

Major Project

In Major Project, students are required to pursue a project allotted to them in accordance with their preference subject to approval of Departmental Committee. They will have to submit a synopsis in the beginning of the semester for the approval to the Department Committee in a specified format and a project report on the project implemented by them at the end of the semester, in a specified format. In the Major Project, projects on real-life problems should be implemented using Python/ C/ C++/ Java, Web Technology, MySQL and the concepts/ technologies studied during the course.

The progress report of each project should be shared by the student to the Departmental Committee. Internal assessment should be done by the Departmental Committee based on the performance in various components including a mid-semester presentation by the students. Students will be required to prepare a **Project Report (Hard Copy)** in the format (based on the concepts of software developments studied in Software Engineering) specified by the Departmental Committee and must be submitted along with CD (having soft copy of the report, coding of the project and .exe of the developed software) for its evaluation.