(University of Delhi)
Shyam Lal College

Course Outcomes

B.Sc. (P) Computer Science

Course Name	Learning Outcomes/Course Outcomes
DSc-Introduction to Programming using C++	On successful completion of the course, students will be able to: **1.** Write simple programs using built-in data types of C++. **2.** Implement arrays and user defined functions in C++. **3.** Solve problems spanning multiple disciplines using suitable programming constructs in C++. **4.** Solve problems spanning multiple disciplines using the concepts of object oriented programming in C++.
Generic: Programming with Python	On successful completion of the course, students will be able to: **1.** Write simple programs using built-in data structures in Python. **2.** Implement arrays and user defined functions in Python. **3.** Solve problems in the respective domain using suitable programming constructs in Python. **4.** Solve problems in the respective domain using the concepts of object oriented programming in Python
DSC: Data Structures using C++	**1.** Compare two functions for their rates of growth. **2.** Understand abstract specification of data-structures and their implementation. **3.** Compute time and space complexity of operations on a data-structure. **4.** Identify the appropriate data structure(s) for a given application and understand the trade-offs involved in terms of time and space complexity. **5.** Apply recursive techniques to solve problems.
Generic: Data Analysis and Visualization using Python	**1.** Apply descriptive statistics to obtain a deterministic view of data **2.** Apply basic and advanced level statistical function on data **3.** Perform data handling using Numpy arrays **4.** Do data cleaning and transformation before extracting useful information **5.** Visualize data for ease of understanding the revealed information
DSC03: Computer System Architecture	**1.** Design combinatorial circuits using basic building blocks. Simplify these circuits using Boolean algebra and Karnaugh maps. Differentiate between combinational circuits and sequential circuits. **2.** Represent data in binary form, convert numeric data between different number systems, and perform arithmetic operations in binary. **3.** Determine various stages of the instruction cycle and describe interrupts and their handling. **4.** Explain how the CPU communicates with memory and I/O devices.

	5. Simulate the design of a basic computer using a software tool.
Generic: Database Management Systems	**1.** Use relational database management software to create and manipulate the database. **2.** Create conceptual data models using entity relationship diagrams for modeling real-life situations and map it to corresponding relational database schema. **3.** Use the concept of functional dependencies to remove redundancy and update anomalies. **4.** Apply normalization theory to get a normalized database scheme to get anomalies free databases. **5.** Write queries in relational algebra. **6.** Implement relational databases and formulate queries for data retrieval and data update problems using SQL. **7.** Learn the importance of index structures and concurrent execution of transactions in database systems.
DSC04: Operating Systems	**1.** Gain knowledge of different concepts of the operating System and its components. **2.** Learn about shell scripts and would be able to use the system in an efficient manner.
Generic: Data Structures using C++	**1.** Compare two functions for their rates of growth. **2.** Understand abstract specification of data-structures and their implementation. **3.** Compute time and space complexity of operations on a data-structure. **4.** Identify the appropriate data structure(s) for a given application and understand the trade-offs involved in terms of time and space complexity. **5.** Apply recursive techniques to solve problems.
DSE: Data Structures	**1.** Demonstrate a thorough understanding of the behaviour of basic data structures. **2.** Implement data structures efficiently in programming language C++. **3.** Demonstrate an understanding of recursion by applying recursive techniques to solve problems.
Core: Computer Networks	**1.** Understand the basics of data communication. **2.** Differentiate between various types of computer networks and their topologies. **3.** Understand the difference between the OSI and TCP/IP protocol suit. **4.** Explain merits and demerits of different types of communication media. **5.** Distinguish between different types of network devices and their functions. **6.** Use IP addressing and understand the need of various

	application layer protocols.
SEC: Web Design using HTML5	**1.** Define the principles and basics of Web page design. **2.** Recognize the elements of HTML. **3.** Apply basic concepts of CSS. **4.** Publish web pages.
SEC: PHP Programming	**1.** Different data types and control structures in PHP. **2.** Handle arrays and strings in PHP. **3.** Create dynamic interactive web pages with PHP. **4.** Use PHP built-in functions as well as define custom functions. **5.** Perform data validation in PHP. **6.** Manipulate and manage a database using PHP.
Analytics with python	**1.** To introduce machine learning techniques to students using Python programming **2.** To enable students to use various tools and packages for advanced data analysis **3.** After studying this course, students will be able to learn about Python's main features and how they make Python a great tool for financial analysts. **4.** After studying this course, students will be able to get familiarized with Anaconda and Jupyter Notebook. **5.** After studying this course, students will be able to learn basics of Machine learning. **6.** After studying this course, students will be able to to apply these techniques on data.
BASIC IT Tools	The Learning Outcomes of this course arc as follows: **1.** By studying this course, students will be able to use word-processor to generate documents with appropriate formatting, layout, review and referencing. **2.** By studying this course, students will be able to manage data in worksheets and workbooks and analyze it using spreadsheet functions and inbuilt formulas. **3.** By studying this course, students will be able to draw analysis on data using spreadsheets to make decisions. **4.** By studying this course, students will be able to make meaningful representations of data in the form of charts and pivot tables. **5.** By studying this course, students will be able to manage data in database tables and use the same for generating queries, forms and reports.