(University of Delhi)
Shyam Lal College

Programme Specific Outcomes and Course Outcomes

B.Sc. (P) Computer Science

Course Name	LearningOutcomes/CourseOutcomes
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 ofobject oriented programming in Python
DSC: Data Structures using C++	On successful completion of the course, students will be able to: **1.** Compare two functions for the irrates 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 andspace complexity. **5.** Applyrecursivetechniquestosolveproblems.
Generic: Data Analysis and Visualization using Python	On successful completion of the course, students will be able to: **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
DSC 03: Computer System Architecture	On successful completion of the course, students will be able to: **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.** ExplainhowtheCPUcommunicateswithmemoryandI/O devices. **5.** Simulate the design of a basic computer using a software tool.
Generic: Database Management Systems	On successful completion of the course, students will be able to: **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.
DSC 04: Operating Systems	On successful completion of the course, students will be able to: **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++	On successful completion of the course, students will be able to: **1.** Compare two functions for the irrates 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 andspace complexity. **5.** Apply recursive techniques to solve problems.
DSE: Data Structures	On successful completion of the course, students will be able to: **1.** Demonstrate a thorough understanding of the behavior 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	On successful completion of the course, students will be able to: **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	On successful completion of the course, students will be able to: **1.** Define the principles and basics of Webpage design. **2.** Recognize the elements of HTML.

	3. Apply basic concepts of CSS. **4.** Publish webpages.
SEC: PHP Programming	On successful completion of the course, students will be able to: **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	On successful completion of the course, students will be able to: **1.** Introduce machine learning techniques to students using Python programming **2.** Use various tools and packages for advanced data analysis **3.** Learn about Python's main features and how they make Python a great tool for financial analysts. **4.** Get familiarized with Anaconda and Jupyter Notebook. **5.** Learn basics of Machine learning. **6.** Apply these techniques on data.
BASIC IT Tools	The Learning Outcomes of this course are 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 andpivot 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.

DSE: Data Mining for Knowledge Discovery	On successful completion of the course, students will be able to: **1.** Pre-process the data for subsequent data mining tasks **2.** Apply a suitable classification algorithm to train the classifier and evaluate its performance. **3.** Apply appropriate clustering algorithm to cluster the data and evaluate clustering quality **4.** Use association rule mining algorithms and generate frequent item-sets and association rules
SEC: Essentials of Python	**1.** By studying this course, students will be able to understand the basics of programming. **2.** By studying this course, students will be able to develop, document and debug modular python program. **3.** By studying this course, students will be able to apply suitable programming constructs and built in data structure to solve a problem.