



शिवाजी कॉलेज  
(दिल्ली विश्वविद्यालय)  
*Shivaji College*  
(University of Delhi)



NAAC ACCREDITED "A" GRADE COLLEGE

## B.Sc. Physical Science with Computer Science

### Learning Outcome

Sr. No	Semester	Paper Type	Subject Name	Learning Outcome
1.	SEM I	Core Paper	<b>Problem Solving using Computers (BSCS01)</b>	<ol style="list-style-type: none"><li>1. Describe the components of a computer and the notion of an algorithm.</li><li>2. Apply suitable programming constructs and data structures to solve a problem.</li><li>3. Develop, document, and debug modular python programs.</li><li>4. Use classes and objects in application programs.</li><li>5. Use files for I/O operations.</li></ol>
2.	SEM II	Core Paper	<b>Database Management Systems (BSCS02)</b>	<ol style="list-style-type: none"><li>1. Use database management system to manage data.</li><li>2. create entity relationship diagrams for modeling real-life situations and design the Database schema.</li><li>3. Use the concept of functional dependencies to remove data anomalies and arrive a Normalized database design.</li><li>4. Write queries using relational algebra and SQL.</li></ol>

3.	SEM III	Core Paper	<b>Operating Systems (BSCS03)</b>	<ol style="list-style-type: none"> <li>1. Understand the rationale behind the current design and implementation decisions in modern Operating Systems by considering the historic evolution.</li> <li>2. identify modules of the operating systems and learn about important functions performed by Operating system as resource manager.</li> <li>3. Use the OS in a more efficient manner</li> </ol>
		SEC 1	<b>Data Analysis using Python Programming (BSCS07A)</b>	<ol style="list-style-type: none"> <li>1. Develop a python script for data analysis and execute it.</li> <li>2. Install, load and deploy the required packages.</li> <li>3. Clean and prepare the data for accurate analysis.</li> <li>4. Analyze the data stored in files in different formats.</li> <li>5. Experiment with data visualization methods.</li> </ol>

4.	SEM IV	Core paper	<b>Computer System Architecture (BSCS04)</b>	<ol style="list-style-type: none"> <li>1. Design combinational circuits using basic building blocks. Simplify these circuits using Boolean Algebra and Karnaugh maps.</li> <li>2. differentiate between combinational circuits and sequential circuits</li> <li>3. Represent data in binary form, convert numeric data between different number systems and perform arithmetic operations in binary.</li> <li>4. Determine various stages of instruction cycle, various instruction formats and instruction set.</li> <li>5. Describe interrupts and their handling.</li> <li>6. Explain how CPU communicates with memory and I/O devices.</li> </ol>
		SEC 2	<b>Introduction to R Programming (BSCS07B)</b>	<ol style="list-style-type: none"> <li>1. Develop an R script for data analysis and execute it.</li> <li>2. Install, load and deploy the required packages.</li> <li>3. Analyze the data stored in files in different formats.</li> <li>4. Identify suitable data visualization and exploration methods to answer a business question.</li> <li>5. Interpret the results of analysis.</li> </ol>

5.	SEM V	DSE 1	<b>Data Structures (BSCS05A)</b>	<ol style="list-style-type: none"> <li>1. Demonstrate a thorough understanding of the behavior of basic data structures.</li> <li>2. Implement data structures efficiently in programming language C++.</li> <li>3. Demonstrate an understanding of recursion by applying recursive techniques to solve problems.</li> </ol>
		DSE 2	<b>Digital Image Processing (BSCS05B)</b>	<ol style="list-style-type: none"> <li>1. Describe general terminology of Digital Image Processing and the roles of image processing systems in a variety of applications.</li> <li>2. Describe the basic issues and the scope (or principal applications) of image processing.</li> <li>3. explain representation and manipulation of digital images, image acquisition, reading, writing, enhancement, displaying and segmentation and image Fourier transform.</li> <li>4. Examine various types of images, intensity transformations and spatial filtering.</li> </ol>

		<b>SEC-3</b>	<b>Programming in C++ (BSCS08A)</b>	<ol style="list-style-type: none"> <li>1. Solve simple programming problems using iteration and selection, and basic constructs: Structures, arrays and functions.</li> <li>2. Create classes and their objects and use access specifiers for data hiding depicting advantage of Abstraction.</li> <li>3. construct classes for code reusability depicting advantage of Inheritance.</li> <li>4. Implement Function Overloading depicting advantage of Polymorphism.</li> <li>5. Create file, read/write from/to files.</li> </ol>
			<b>Programming in Java (BSCS08B)</b>	<ol style="list-style-type: none"> <li>1. Develop and execute Java programs using iteration and selection.</li> <li>2. Create classes and their objects.</li> <li>3. Implement OOPS concepts to solve problems using JAVA</li> </ol>

6.	SEM VI	DSE 1	<b>Computer Networks (BSCS06A)</b>	<ol style="list-style-type: none"> <li>1. Understand the basics of data communication.</li> <li>2. Differentiate between various types of computer networks and their topologies.</li> <li>3. Understand the difference between the OSI and TCP/IP protocol suit.</li> <li>4. Explain merits and demerits of different types of communication media.</li> <li>5. Distinguish between different types of network devices and their functions.</li> <li>6. Use IP addressing and understand the need of various application layer protocols.</li> </ol>
		DSE2	<b>Analysis of Algorithms (BSCS06B)</b>	<ol style="list-style-type: none"> <li>1. Understand the idea of algorithm analysis.</li> <li>2. Understand characteristics of searching and sorting algorithms and compare efficiency of different solutions for an application at hand. Model simple problems as <b>graphs</b> and solve those using graph algorithms.</li> </ol>

		<b>DSE3</b>	<b>Project Work / Dissertation (BSCS06C)</b>	<ol style="list-style-type: none"> <li>1. Develop a project plan based on informal description of the project.</li> <li>2. Implement the project as a team.</li> <li>3. Write a report on the project work carried out by the team and defend the work done by the team collectively.</li> <li>4. Present the work done by the team to the evaluation committee.</li> </ol>
		<b>SEC-4</b>	<b>Advanced Programming in Java (BSCS09A)</b>	<ol style="list-style-type: none"> <li>1. Implement Exception Handling and File Handling.</li> <li>2. Implement multiple inheritance using Interfaces.</li> <li>3. logically organize classes and interfaces using packages</li> <li>4. Use AWT classes to design GUI applications.</li> </ol>
			<b>Web Design using HTML5 (BSCS09B)</b>	<ol style="list-style-type: none"> <li>1. Define the principles and basics of Web page design.</li> <li>2. Recognize the elements of HTML.</li> <li>3. Apply basic concepts of CSS.</li> <li>4. Publish web pages.</li> </ol>
			<b>Android Programming (BSCS10A)</b>	<ol style="list-style-type: none"> <li>1. Describe the design of Android operating system.</li> <li>2. Describe various components of Android applications.</li> <li>3. Design user interfaces using various widgets, dialog boxes, menus.</li> <li>4. Design application with interaction among various activities/applications using intents.</li> <li>5. Develop application(s) with database handling.</li> </ol>

### Details of Papers of Generic Elective - (GE)

Sr. No	Semester	Subject Name	Learning Outcome
7.	<b>SEM I</b>	<b>Programming using Python (CSGE101)</b>	<ol style="list-style-type: none"> <li>1. Describe the components of a computer and notion of an algorithm.</li> <li>2. Apply suitable programming constructs and built-in data structures to solve a problem.</li> <li>3. Develop, document, and debug modular python programs.</li> <li>4. Use classes and objects in application programs and visualize data.</li> </ol>
8.	<b>SEM II</b>	<b>Database Management System (CSGE201)</b>	<ol style="list-style-type: none"> <li>1. Describe the features of database management systems.</li> <li>2. Differentiate between database systems and file systems.</li> <li>3. Model an application's data requirements using conceptual modelling tools like ER diagrams and design database schemas based on the conceptual model.</li> <li>4. Write queries in relational algebra / SQL.</li> <li>5. Normalize a given database schema.</li> </ol>
9.	<b>SEM III</b>	<b>Computer Networks (CSGE301)</b>	<ol style="list-style-type: none"> <li>1. State the use of computer networks and different network topologies.</li> <li>2. Distinguish between LAN, MAN, WAN, and between Intranet, Extranet and Internet.</li> <li>3. Compare OSI and TCP/IP architectures</li> <li>4. Enumerate different</li> </ol>



			<p>transmission media and describe the use of each of them.</p> <p>5. Design web pages using HTML.</p>
10.	<b>SEM IV</b>	<b>Information Security and Cyber Laws (CSGE401)</b>	<ol style="list-style-type: none"> <li>1. Learn, structure, mechanics and evolution of various crime threats</li> <li>2. Learn to protect information systems from external attacks by developing skills in enterprise security, wireless security and computer forensics.</li> <li>3. Analyze the risks involved while sharing their information in cyber space and numerous related solutions like sending protected and digitally signed documents</li> <li>4. Insights of ethical hacking and usage of password cracking tools</li> <li>5. Get an overview of different ciphers used for encryption and decryption.</li> </ol>