



Department of Computer Science

Sukanta Mahavidyalaya

Dhupguri, Jalpaiguri

Programme Outcomes, Programme Specific Outcomes
and Course Outcomes for UG Programme

Programme Name: *B.Sc Computer Science program*

Number of Semesters: 6

Programme Outcomes

The Computer Science Department's Bachelor of Computer Science Program course must enable students to attain, by the time of graduation:

- With the B.Sc. Computer Science, students will be able to apply for a range of computational and mathematical jobs in the creative industries, business, finance, education, medicine, engineering and science.
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computational systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
- Provide students with knowledge, general competence, and analytical skills in Computer Science on an advanced level.
- Prepare them for academics, industry, and research.
- Provide hands-on experience to apply computing skills in all other fields of study like Mathematics, Geography, Bio Sciences, Physics, Chemistry, Linguistics, Music, Medical Sciences etc.

Programme Specific Outcomes

Students will:

- Become technology-oriented with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of computer systems and technology on people and society as a whole.
- Acquire some development experience within a specific field of Computer Science, through project work.
- Gain ability to apply knowledge of Computer Science to the real-world issues.
- Get familiar with current research trends in various fields of Computer Science.
- Use creativity, critical thinking, analyses and research skills.
- Get prepared for placement by developing personality and soft skills.
- Gain ability to communicate scientific information in a clear and concise manner.
- Build up programming, analytical and logical thinking abilities.
- Know the recent developments in IT, future possibilities and limitations, and understand the value of lifelong learning.
- Get an ability to participate in debates, discussions in the society constructively.

Course Outcomes

SEMESTER—I		
Course Code	Course Name	Course Outcomes
CC 1	Computer System Architecture	Knowledge gained: <ul style="list-style-type: none">• Understand the theory and architecture of hardwired and microprogram controlled central processing units

		<ul style="list-style-type: none"> • Learn the concepts of parallel processing, pipelining and inter-processor communication. • Define different number systems, binary addition and subtraction, 2's complement representation and operations <p>Skills gained:</p> <ul style="list-style-type: none"> • Analyze some of the design issues in terms of speed, technology, cost, performance • Design a simple CPU with applying the theoretical concepts • Understand the architecture and functionality of central processing unit <p>Competency developed:</p> <ul style="list-style-type: none"> • Use appropriate tools to design verify and test the CPU architecture. • Exemplify in a better way the I/O and memory organization.
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Semester II

Course Code	Course Name	Course Outcomes
CC 2	Programming Fundamentals using C	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Understanding a functional hierarchical code organization. • Ability to define and manage data structures based on problem subject domain. • Ability to work with textual information, characters and strings. • Ability to work with arrays of complex objects. • Understanding a concept of object thinking within the framework of functional model. • Understanding a concept of functional hierarchical code organization. • Understanding a defensive programming concept. Ability to handle possible errors during program execution. <p>Skills gained:</p> <ul style="list-style-type: none"> • Logical thinking • C Programming <p>Competency developed:</p> <ul style="list-style-type: none"> • Ability to write programs of moderate complexity in C Programming • Developing real world application using C Programming
CC 2L	Programming Fundamentals using C Lab	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • This lab work provides hands-on experience for C Programming. • Read, understand and trace the execution of programs written in C language. • Write the C code for a given algorithm. • Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor. • Write programs that perform operations using derived data types <p>Skills gained:</p> <ul style="list-style-type: none"> • Programming in C <p>Competency developed:</p> <p>Developing application to solve real world problem using C</p>

Semester III

Course Code	Course Name	Course Outcomes
CC 3	Computer Networks	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Basic networking concepts, types of networks, various topologies and application of networks • types of addresses, data communication. • wired and wireless networks, its types, functionality of layer • importance of network security and cryptography • concept of networking models, protocols, functionality of each layer <p>Skills gained:</p> <ul style="list-style-type: none"> • Learn basic networking hardware and tools. • Create hybrid topologies using the existing topologies, and check efficiency. • Apply different encoding and decoding mechanisms involved in different types of transmission media and to measure the transmission impairments. <p>Competency developed:</p> <ul style="list-style-type: none"> • Create a new protocol and test its efficiency. • Design various categories of networks and test the transmission rate.
SEC 1	Office Automation Tools	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Office Automation tools course would enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools. • To familiarize the students in preparation of documents and presentations with office automation tools. <p>Skills gained:</p> <ul style="list-style-type: none"> • to perform documentation • to perform accounting operations • to perform presentation skills

Semester IV

Course Code	Course Name	Course Outcomes
CC 4	Data Structures	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms • Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs • Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs • Demonstrate different methods for traversing trees • Illustrate various technique to for searching, Sorting and hashing • Describe the concept of recursion, give examples of its use, describe

		<p>how it can be implemented using a stack</p> <ul style="list-style-type: none"> • Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing. • Summarize different categories of data Structures <p>Skills gained:</p> <ul style="list-style-type: none"> • Compare alternative implementations of data structures with respect to performance • Compare and contrast the benefits of dynamic and static data structures implementations • Explain the significance of dynamic memory management Techniques • Identify different parameters to analyze the performance of an algorithm. <p>Competency developed:</p> <ul style="list-style-type: none"> • Choose appropriate data structures to solve real world problems efficiently. • Design and implement an appropriate hashing function for an application • Design algorithms to perform operations with Linear and Nonlinear data structures
CC 4L	Data Structures Lab	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Write programs using structures, unions, dynamic memory allocation functions and command line arguments • Implement code for linear data structures like stacks, queues, linked lists using static and dynamic allocation and their applications • Implement program for binary search tree using nonlinear data structure. • Write programs using arrays, strings, dynamic memory allocation functions • Implement program for binary search tree and Graphs using nonlinear data structure. <p>Skills gained:</p> <ul style="list-style-type: none"> • Programming real life application in C/C++ <p>Competency developed:</p> <ul style="list-style-type: none"> • Understand and choose the appropriate data structure for solving real world problems.
SEC 2	HTML Programming	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • To introduce the fundamentals of Internet, and the principles of web design. • To construct basic websites using HTML and Cascading Style Sheets. • To build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms. • To develop modern interactive web applications using PHP, XML and MySQL <p>Competency developed:</p> <ul style="list-style-type: none"> • To learn HTML tags and JavaScript Language programming concepts and techniques.

		<ul style="list-style-type: none"> • To develop the ability to logically plan and develop web pages. • To learn to write, test, and debug web pages using HTML and JavaScript.
Semester V		
Course Code	CourseCode	CourseCode
DSE 1A	Data Base Management Systems	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Types of databases • Detailed architecture, define objects, load data, query data and performance tune databases. • Writing SQL queries for the given problem statement <p>Skills gained:</p> <ul style="list-style-type: none"> • Establish a basic understanding of the process of Database • Develop ER diagram for representing conceptual data model • Convert ER diagram into a set of relations representing logical data model <p>Competency developed:</p> <ul style="list-style-type: none"> • Gain ability to handle large volumes of structured, semi-structured, and unstructured data using database technologies. • Appreciate the need for DB approach and understand the components and roles of DBMS • Apply DB system development life cycle to business problems • Implement a set of relations in the chosen DBMS • Development and Administration using MySQL. • Analyze and Select storage and recovery techniques of database system. <p>Competency developed:</p> <ul style="list-style-type: none"> • Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
	Operating Systems	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • To understand Complexity of Operating system as a software • To understand design issues related to process management and various related algorithms • To understand design issues related to memory management and various related algorithms • To understand design issues related to File management and various related algorithms • Allocate Main Memory based on various memory management techniques • Compare Memory allocation using Best fit, Worst fit, and first fit policies • Apply page replacement policies for dynamic memory management • Schedule CPU time using scheduling algorithm for processors • Compare various device scheduling algorithms <p>Skills gained:</p> <ul style="list-style-type: none"> • To evaluate, and compare OS components through instrumentation for performance analysis. • To analyze the various device and resource management techniques for timesharing and distributed systems

		<p>Competency developed:</p> <ul style="list-style-type: none"> To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems. To develop and analyze simple concurrent programs using transactional memory and message passing, and to understand the trade-offs and implementation decisions
SEC 3	Visual Basic Programming	<p>Knowledge gained:</p> <ul style="list-style-type: none"> This course provides the skills and knowledge required to use essential features and capabilities of Visual BASIC, a programming system used to produce Graphical User Interfaces and applications in a Windows environment. It includes basic programming concepts, problem solving, programming logic, and the design of event-driven programming. <p>Competency developed:</p> <ul style="list-style-type: none"> The student will demonstrate knowledge of visual programming The student will demonstrate knowledge of program design The student will apply and synthesize knowledge of user interface design The student will demonstrate understanding and application of a modern Integrated Development Environment (IDE) The student will demonstrate the ability to synthesize knowledge of fundamental computer programming The student will demonstrate the ability to analyze program development and maintenance
Semester VI		
Course Code	CourseCode	CourseCode
DSE 1B	Project Work	<p>Knowledge gained:</p> <ul style="list-style-type: none"> Identify and define the problem statement Define and justify scope of the proposed problem Gather and analyze system requirements Propose an optimized solution among the existing solutions Practice software analysis and design techniques Develop a functional application based on the software design Apply coding, debugging and testing tools to enhance the quality of the software Construct new software system based on the theory and practice gained through this exercise Prepare the proper documentation of software projects following the standard guidelines Develop technical report writing and oral presentation <p>Skills gained:</p> <ul style="list-style-type: none"> Software Project Development

		<p>Competency developed:</p> <ul style="list-style-type: none"> • Professional Software Developer
<p>SEC 4</p>	<p>My SQL</p>	<p>Knowledge gained:</p> <ul style="list-style-type: none"> • Understand basic concepts of how a database stores information via tables. • Understand SQL syntax used with MySQL. • Learn how to retrieve and manipulate data from one or more tables. • Learn how to filter data based upon multiple conditions. • Update and insert data into the existing tables. • Understand how the relationships between tables will affect the SQL. • Understand the advantages of stored procedures along with storing data using variables and functions. • Boost ability through innovative and independent learning. • Get a certificate on successful completion of the course. <p>Competency developed:</p> <ul style="list-style-type: none"> • Gain familiarity with the MySQL development environment • Understand basic concepts of database development: SQL, Database design, Administration, and Security • Design and code a database solution