SONAMUKHI COLLEGE
DEPARTMENT OF COMPUTER SCIENCE

**Program Outcome (PO), Program Specific Outcome (PSO) and Course Outcome (CO)
For B.Sc. Hons.(CBCS Pattern) in Computer Science Affiliated to Bankura University**

Upon completion of the B.Sc. (Honours) Degree with the Computer Science as a
core subject, a graduate student should be able to:

➢ **Program Outcome (PO):**

PO NO.	Program Outcomes and their description
PO 1	**Sound domain knowledge:**Understand the basic and advanced concepts of Computer Science Research and career growth. To create graduates with basic knowledge of Computer Science who can contribute towards generate Science and Technology.
PO 2	**Problem analysis:** Developing problem analysis skills and knowledge and applying the same in real life problems
PO 3	**Laboratory skill:** To be able to write programs in different programming languages and run them in computer.
PO 4	**Individual and team work:** An ability to function on multi-disciplinary teams. To support students to co-ordinate with one another as team environment
PO 5	**Modern Tool Usage:** An ability to use the techniques, skills, and modern IT tools necessary for technical practice. To be able to upgrade themselves to apply modern theories.

Upon completion of these courses the student will be able to:

➢ **Program Specific Outcomes(PSO):**

PSO NO.	Program Specific Outcomes and their description
PSO 1	**Professional Skills:** The ability to understand, analyze, and develop computer programs in the areas related to algorithms, system software, multimedia, web design and networking for efficient design of computer-based systems.
PSO 2	**Successful career:** Students will be prepared to make their career in the IT segments like Software services, Business Process Management (BPM/BPO), Programmer and freelancing. Students can also appear for various competitive exams including IT officers in various organizations and can pursue for higher studies.
PSO 3	**Technical SkillDevelopment:** Develop programming skills, networking skills, learn applications, packages, programming languages and modern techniques of IT.
PSO 4	**Spirit of Team Work:** To encourage students to co-ordinate withone another as team member rather than to try to excel individually.
PSO 5	**Personality Development:** To help students develop personality in their professional and personal lives and thus make them responsible and sincere citizens of the society.

➢ **COURSE OUTCOME(CO):**

Course Outcomes of B. Sc. Computer Science (Core) Semester-I		
Course Title	**Course Code**	**Course Outcome**
Programming Fundamentals using C/C++	**SH/CSC/101-C1**	**CO-1:** Illustrate the fundamentals of programming languages. **CO-2:** To become skilled at developing simple algorithms. **CO-3:** Analyze different data types and arrays **CO-4:** To learn about array, functions and Pointers. **CO-5:** To write C/C++ programs for solving reallife problems. **CO-6:** Create files and perform file operations using C. **CO-7:** Identify the structure of OOPs. **CO-8:** Make use of objects and classes.
Computer System Architecture	**SH/CSC/102-C2**	**CO-9:** Explain the basic concepts of digital principles. **CO-10:** Differentiate the various number systems. **CO-11:** Discuss Various arithmetic and logical operations. **CO-12:** To become skilled at developing differenttypes of combinational and sequential circuits. **CO-13:**To learn about the working principle ofinterfaces between software and hardware. **CO-14:** To learn about the working principle ofcentral processing unit of a Computer.
Course Outcomes of B. Sc. Computer Science (Core) Semester-II		
Course Title	**Course Code**	**Course Outcome**
Programming in Java	**SH/CSC/201/C-3**	**CO-15:** State OOPs and relate Java syntax with C and C++. **CO-16:** Categorize OOPs such as encapsulation, abstraction, polymorphism. **CO-17:** Use, write, compile, debug and learn in Java programming. **CO-18:** Identify different types of inheritance and apply them for reusability of code.

Discrete Structures	SH/CSC/202-C4	**CO-19:** Develop Graph Theory. **CO-20**: Formulate the fundamentals of Set and Functions. **CO-21:** Develop Propositional Logic. **CO-22:** Evaluate trees. **CO-23:** Students will be able to Study the objectives and problems related to all branches of computer science such as cryptography, automated theorem proving etc.

Course Outcomes of B. Sc. Computer Science (Core) Semester-III		
Course Title	**Course Code**	**Course Outcome**
Data Structures	**SH/CSC/301-C5**	**CO-24:** Summarize different programming methodologies and analysis of various algorithms. **CO-25:** Illustrate the concept of Stack and Queue **CO-26:** Students will be able to implement various sorting, searching, and hashing algorithms **CO-27:** Analyze and implement linked list concept **CO-28:** Students will be capable to identify the appropriate data structure for given problem.
Operating Systems	**SH/CSC/302-C6**	**CO-29:** Summarize the basic concepts, structure and functions of operating systems. **CO-30:** Students will be able to acquire knowledge in the objectives of operating systems, how operating systems are related to computer hardware, what functionalities are provided to users, and what the major components are in operating systems. **CO-31:** Outline process management concepts and inter process communication mechanisms in OS. **CO-32:** Identify various CPU scheduling algorithms and deadlock handling mechanisms.
Computer Networks	**SH/CSC/303-C7**	Students will be able to **CO-33:** Acquire the computer networking knowledge as well as the existing connectivity technologies. **CO-34:** Establish a solid knowledge of the layered approach. **CO-35:** Summarize various Multiplexing and Switching techniques. **CO-36:** Summarize OSI reference model.

Any one of **Programming in Python** **Unix/Linux Programming**	**SH/CSC/305- SEC-1**	**CO-37:** Explain basic knowledge of python and construct simple python program. **CO-38:** Students will be able to acquire programming skills in core Python. **CO-39:** Students will be able to acquire ObjectOriented Skills in Python. **CO-40:** Students will be able to Solve problemsrequiring the writing of well-documented programs in the Python language, including use of the logical constructs of that language.

Course Outcomes of B. Sc. Computer Science (Core) Semester-IV		
Course Title	**Course Code**	**Course Outcome**
Analysis and Design of Algorithms	**SH/CSC/401- C8**	Students will be able to **CO-41:** Analyze and differentiate the types of asymptotic notations. **CO-42:** Learn and illustrate the divide and conquer method. **CO-43:** Design algorithms to solve different types of problems in the branch of computer science and information technology. **CO-44:** Know and explain the dynamic programming method.
Software Engineering	**SH/CSC/402- C9**	Students will be able to **CO-45:** Define software, explain the nature of software, software process and software engineering practice, explain and compare the various models. **CO-46:** Explain the quality concepts, Software Quality Assurance tasks, discuss **CO-47:** Develop various theoretical implementations of software with the knowledge of software engineering. This can help to create new software.
Database Management System	**SH/CSC/403-C10**	Students will be able to **CO-48:** Define the basic concepts and applications of Database Management System. **CO-49:** Sketch and Relate E-R diagrams with relations **CO-50:** Work with a huge database. Through database management system they can work with any real life database. **CO-51:** Develop relational algebra, perform Normalization and Develop SQL queries.

Any one of **HTML Programming XML programming**	**SH/CSC/405/SEC-2**	**CO-52:** HTML is a type of document file language which helps students to display documents and files on web-browser in the form of Website. **CO-53:** Students will be able to create a new webpage. **CO-54:** The course will allow them to design web pages. **CO-55:** They can implement different applications using HTML & XML. **CO-56:** They can also decorate the page in various ways.
Course Outcomes of B. Sc. Computer Science (Core) Semester-V		
Course Title	**Course Code**	**Course Outcome**
Internet Technologies	**SH/CSC/501-C11**	Students will be able to **CO-57:** Design different types of Client side Server side applications. **CO-58:** Design Web-enabled applications using JavaScript Programming, Java Server Pages and Java Database Connectivity. **CO-59:** Work with Java Beans. **CO-60:** Can learn and implement different applications like stand alone applications, web applications.
Theory of Computations	**SH/CSC/502-C12**	Students will be able to **CO-61:** classify formal languages into regular, context-free languages. **CO-62:** Design finite state automata, regular grammar, and regular expression. **CO-63:** Design various theoretical implementations associated with computation theory. **CO-64:** They can solve different problems of machine automaton.
Any one of **Numerical methods Operations Research**	**SH/CSC/503-DSE-1**	Students will be able to **CO-65:** Solve various types of Numerical or Mathematical problems. **CO-66:** Implement various numerical methods with high accuracy through programming languages. **CO-67:** Implement different numerical methods using MATHEMICA
Any one of **Microprocessor Digital Image Processing**	**SH/CSC/504/DSE-2**	Students will able to **CO-68:** Study the functional blocks of Microprocessor. **CO-69:** Explain the architecture and instruction set of 8086 microprocessor. **CO-70:** Understand Assembly Language Programming.

Course Outcomes of B. Sc. Computer Science (Core) Semester-VI		
Course Title	**Course Code**	**Course Outcome**
Artificial Intelligence	**SH/CSC/601-C13**	Students will able to **CO-71:** Outline the scope and limits of Artificial Intelligence **CO-72:** Learn about various AI based problemsolving and searching algorithms. **CO-73:** Learn about different knowledge representation techniques. **CO-74:** Solve basic AI problems using prolog programming.
Computer Graphics	**SH/CSC/602-C14**	Students will able to **CO-75**: Describe the working of various graphics input and display devices. **CO-76:** Illustrate the line drawing and circle generating algorithm. **CO-77:** Understand different 2D and 3D graphics objects generating algorithms. **CO-78:** Design various graphics effects using computer in the laboratory
Any one of **Information Security** **Introduction to data science**	**SH/CSC/603-DSE-3**	Students will able to **CO-79:** Outline the common threats in computing faced today. **CO-80:** Summarize the basic information security policies and models **CO-81:** Understand and learn various public keyas well as secret key cryptographic algorithms. **CO-82:** Learn about different cyber security Measures.
Any one of **Project Work** **Network Programming**	**SH/CSC/604-DSE-4**	Students will able to **CO-83:** Develop a project in Computer Science field. **CO-84:** Develop the capability to manage projects as an individual or as a member or leader in a team. **CO-85:** Design real life software projects underthe guidance of teachers. **CO-86:** Solve these software projects using different modern programming languages andrecent software technologies.