Programme Outcomes (PO)

Programme Specific Outcomes (PSO)

Course Outcomes (CO)



of

B.Sc. Computer Science (Hons.)

Kendrapara Autonomous College, Kendrapara

**PROGRAMME OUTCOMES (PO)**

The programme learning outcomes of Kendrapara Autonomous College, kendrapara focuses on imparting good quality education through audio visual, experiential and experimental learning to prepare the students for higher study in academic institutions of National importance, employment, entrepreneurship and responsible citizens. After pursuing three year undergraduate programme in Computer Science, a student will have the following qualities given in the form of graduate attributes prescribed by UGC:

**PO1:** **Disciplinary Knowledge:** Students will be able to gain deep level of knowledge in computer science subjects through quality-based education and comprehensive assessment. It will help to develop new revolutionary technologies in different sectors such as healthcare, agriculture, energy sector, education, transportation at national and global level.

**PO2**: **Critical Thinking**: The students will have the ability to analyze the information and makes a decision. This also involves identifying the authenticate sources, test of hypotheses, formulate valid arguments and critically evaluate theories and practices by following scientific approach.

**PO3**: **Problem Solving**: Necessary skills and analytical abilities will be developed among the students to solve the real life problems by computer based solutions.

**PO4**: **Analytical Reasoning**: Students will have the ability to analyze situations in rational way and solve the problem adequately.

**PO5: Scientific Reasoning**: Inculcate scientific temper among the students to develop a research culture and provide solutions for issues at local and global level.

**PO6**: **Information and Digital Literacy**: Augment the knowledge of recent developments in the field of IT industry and capable of using ICT in a variety learning situations.

**PO7**: **Professional Development:** Historical, current and upcoming techniques and technologies will be explored by the students that will lead them for a lifelong learning and professional development.

**PO8: Self Directed Learning**: Ability to identify the resources required for learning new technologies to handle a project and work independently.

**PROGRAMME SPECIFIC OUTCOMES (PSO)**

After pursuing B.Sc. Computer Science (Hons.) at Kendrapara Autonomous College, a student will be able to -:

**PSO1:** Demonstrate the fundamentals of computer system as well as designing of combinational and sequential circuits that are used in computing purposes in digital logic.

**PSO2:** Model different computational problems by applying mathematical concepts and design the solutions through the use of appropriate data structures and algorithms.

**PSO3:** Understand, analyze and develop problem solving skills through the use of different programming tools like C, C++, python, java, JavaScript, PHP.

**PSO4:** Understand the underlying interconnection structures of systems through Networking, control structure of computer system through Operating System.

**PSO4:** Understand the real-world problems and design and develop solutions by following standard software engineering principles.

**PSO5:** Integrate knowledge of computer science, mathematics and statistics on different data for experimental and research purpose.

**PSO6:** Make use of advanced computing techniques and tools creating innovative solutions for problems like climate change, healthcare, energy and transportation.

**PSO7:** Use of knowledge and skills required for web development, software development and to be an entrepreneur in areas such as data analytics, Networking and Image processing.

**PSO8:** Use of professional ethics and ethical principles and responsibilities of engineering practice.

**PSO9:** Creating awareness in the society for the proper use of computing system to avoid any kind of harm to individuals and to the society.

**Course Outcomes of B.Sc. Computer Science UG Course**

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| **CC-1 Programming Using C** | | **Relevance** |
| **Unit -1** | **CO1:** Understand the Basic Structure, Different Data types, Program Constructs, Operators and Control Structures in C | **Global** |
| **Unit -2** | **CO2:** Understand the concept of different types of loops and implement them in different programs.  **CO3:** Understand the concept of different types of arrays and pointers, implement them in different programs and analyse the benefits of using them. | **Global** |
| **Unit -3** | **CO4:** Understand the concept of different types of storage classes and functions, implement them in different programs.  **CO5:** Understand the concept of Dynamic memory allocation using different memory management functions. Command line arguments concept implementation. | **Global** |
| **Unit- 4** | **CO6:** Understand the concept of Structure and Union, implement file in C. | **Global** |

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| **CC-1 Practical Programming Using C Lab** | |  |
| **CO1** | Construct programs using control statements, loops, arrays, pointers, structures and unions, functions and files in C. | Local |

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| **CC-2 Digital Logic** | |  |
| **Unit -1** | **CO1:** Understand the concept of number system, design of different logic gates and minimization of logic expressions. | **Global** |
| **Unit -2** | **CO2:** To Learn the design of Arithmetic Logic Units, the representation and Arithmetic of Floating-Point Numbers. | **Global** |
| **Unit -3** | **CO3:** Design and application of flip flops, combinational circuits and Sequential circuits. | **Global** |
| **Unit- 4** | **CO4:** A detailed Study about memory system hierarchy and Semiconductor memory system. | **Global** |

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| **CC-2 Practical Digital Logic** | |  |
| **CO1** | Realization of logic gates using Xilinx Software. |  |
| **CO2** | Realization of combinational circuits. |  |

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| **CC-3 Programming Using C++** | |  |
| **Unit -1** | **CO1:** Review the Basic Structure, Different Data types, Program Constructs, Operators and Control Structures in C++.  **CO2:** Understand the Principles of Object-Oriented Programming, Difference between C and C++, implement inline function and default arguments. | **Global** |
| **Unit -2** | **CO3:** Understand the concept of Classes, Objects and define the member functions, implement array of Objects, Objects as function arguments and friend functions.  **CO4:** Understand the concept of different types of Constructors and familiarize with Destructors. | **Global** |
| **Unit -3** | **CO5:** Understand the concept of different types of inheritances and implement them in different programs.  **CO6:** Understand the concept of Polymorphisms: Implement Function Overloading and Operator Overloading | **Global** |
| **Unit- 4** | **CO7:** Develop applications using stream I/O and file I/O in C++. Command line arguments concept implementation in C++. | **Global** |

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| **CC-3 Practical Programming Using C++ Lab** |  |
| **CO1:** Construct programs using inline function, reference variables, class, friend function, function overloading, function overriding, different types of inheritances, different types of constructors, constructor overloading, command line arguments and files in C++. | **Local** |

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| **CC-4 Data Structure** | |  |
| **Unit -1** | **CO1:** Study the basic terminologies, operations and its types on data structures like Array and Linked List. | **Global** |
| **Unit -2** | **CO2**: Understand and know the representation, implementation and application of Stack and Queue Data Structure. | **Global** |
| **Unit -3** | **CO3:** Know the structure, definitions, types and application of Tree Data Structure. | **Global** |
| **Unit- 4** | **CO4:** Learn and Analyse some efficient searching and sorting techniques. | **Global** |

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| **CC-4 Practical Data Structure Lab** | |  |
| **CO1** | Students develop the programs related to basic data structures like Array, Linked List, Stack and Queue. | Local |
| **CO2** | Students implement the searching and sorting techniques in C programming language. | Local |

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| **CC-5 Java Programming** | |  |
| **Unit -1** | **CO1:** Understand the Basic Structure, Different Data types, Program Constructs, Operators and Control Structures in Java.  **CO2:** Category of reading data from keyboard in Java and Program Constructs. | **Global** |
| **Unit -2** | **CO3:** Overview of OOP, implement classes and objects, packages and interfaces, implement array of Objects, Objects as function arguments, polymorphism, inheritance.  **CO4:** Understand the concept of different types of Constructors and familiarize with final method, final class, garbage collection, auto- boxing, un-boxing, up-casting and down-casting. | **Global** |
| **Unit -3** | **CO5:** Implement array in Java, Understand the concept of String and I/O operation using different StreamFile Classes and methods. | **Global** |
| **Unit- 4** | **CO6:** Familiarize Threads and Exceptions Handling, Implement JDBC in Java | **Global** |

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| **CC-5 Practical Java Programming Lab** |  |
| **CO1:** Implement programs using the concept of different methods of reading data from keyboard, method overloading, method overriding, different types of inheritances, different types of constructors, constructor overloading, package, interface, Threads, Exceptions Handling, JDBC in Java. | **Local** |

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| **CC-6 Database Systems** | |  |
| **Unit -1** | **CO1:** Classify the different users of Database, different category of data models.  **CO2:** Understand the concept of ER diagram and its design, familiarize with different types of keys and attributes, understand the EER model concept. | **Global** |
| **Unit -2** | **CO3:** Understand concept of Functional Dependency and normalization | **Global** |
| **Unit -3** | **CO4:** Understand concept of Relational Data Model, Use the basics of SQL and construct queries using SQL in database creation and interaction, understand the concept of constraints in SQL.  **CO5:** Familiarize with relation algebra and relational calculus. | **Global** |
| **Unit- 4** | **CO6:** Will be able to explain the principle of transaction management system. Understand the concept of ACID properties and concurrency control, different locking techniques for concurrency control and understand the concept of different types schedules. | **Global** |

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| **CC-6 Practical Database Systems Lab** |  |
| **CO1:** Create different types of SQL queries using SQL commands, design table, perform various truncations (insert, update, delete) in tables using SQL. | **Local** |

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| **CC-7 Discrete Mathematical Structures** | |  |
| **Unit -1** | **CO1:** Students learn different methods of Proofs, valid arguments using Logic and representation of data through sets. | **Global** |
| **Unit -2** | **CO2:** Study different counting techniques of Combinatorics and methods to solve Recurrence Relation. | **Global** |
| **Unit -3** | **CO3:** Study about the Graph Terminology, Representation and problems and the relevant solutions. | **Global** |
| **Unit- 4** | **CO4:** Learn and analyse the Modesl of Computation of a Computing Machine. | **Global** |

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| **CC-7 Practical Discrete Mathematical Structures Lab** | |  |
| **CO1** | Students implement different Counting Technique methods using C Language. | Local |
| **CO2** | Students solve discrete mathematical problems using C language. |  |

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| **CC-8 Operating Systems** | |  |
| **Unit -1** | **CO1:** Introduction to Operating Systems its Structure, Services and design and Implementation. | **Global** |
| **Unit -2** | **CO2:** Understand the Concept of Processes and Threads, Evaluate performance of Process Scheduling algorithms, Handling Deadlocks in the system. | **Global** |
| **Unit -3** | **CO3:** Studyand analyse different Memory Management Strategies and its various Problems associated to each strategy and the relevant Solutions. | **Global** |
| **Unit- 4** | **CO4:** Understand different File System Concept, Accessing Methods and their implementation. | **Global** |

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| **CC-8 Practical Operating Systems Lab** | |  |
| **CO1** | Students Implement programs related to Process and Process Scheduling. | Local |
| **CO2** | Students implement programs using System Calls covered in theory part of CC-8 Course. | Local |

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| **CC-9 Computer Networks** | |  |
| **Unit -1** | **CO1:** Students learn about different Network Models, Network Topology, Protocols and Standards of Data Communication. | **Global** |
| **Unit -2** | **CO2:** Study different Signal Conversion Methods and different Transmission Media used in Computer Network. | **Global** |
| **Unit -3** | **CO3:** Learn about Error Detection and Correction methods and analyse the performance of different flow control protocols used in different layers of Network Model. | **Global** |
| **Unit- 4** | **CO4:** Comparativestudy and application of Network Layer Protocols, Transport Layer Protocols and Application Layer Protocols. Also, Students Learn about fundamentals of Network Security. | **Global** |

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| **CC-9 Computer Networks Lab** | |  |
| **CO1** | Students will learn the use of simulator and simulate some network methods covered in theory section. | Local |

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| **CC-10 Computer Graphics** | |  |
| **Unit -1** | **CO1:** Introduction to basic structure, terminologies, Hardware and software associated with Computer Graphics | **Global** |
| **Unit -2** | **CO2:** Learn and Understand basic Graphics Output Primitives | **Global** |
| **Unit -3** | **CO3:** Analyse about both 2-D and 3-D Transformations. | **Global** |
| **Unit- 4** | **CO4:** Analyse and Evaluate the Performance of different Clipping Algorithms**.** | **Global** |

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| **CC-10 Practical Computer Graphics Lab** | |  |
| **CO1** | Students implement different graphical images through the use of programming language. | Local |

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| **CC-11 Web Technology** | |  |
| **Unit -1** | **CO1:** Students will be able to create a dynamic webpage by using the methods and attributes of HTML. | **Global** |
| **Unit -2** | **CO2:** Students can build an attractive webpage by adding the features of CSS. | **Global** |
| **Unit -3** | **CO3:** Students will be able to write client-side script and can create interactive webpages. | **Global** |
| **Unit- 4** | **CO4:** Server-side application by using PHP. | **Global** |

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| **CC-11 Practical Web Technology Lab** | |  |
| **CO1** | An interactive and attractive webpage can be developed by the students by applying the theory of HTML, CSS, PHP and JavaScript. |  |

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| **CC-12 Software Engineering** | |  |
| **Unit -1** | **CO1:** Introduction to different Discipline and Principle of Software Engineering and Study about different types of Software Lifecycle Models. | **Global** |
| **Unit -2** | **CO2:** Students Learn about Complexities and Responsibilities arising during Project Management. | **Global** |
| **Unit -3** | **CO3:** A Study and Analysis of Requirement Analysis and Specification Phase and Design Phase of SDLC. | **Global** |
| **Unit- 4** | **CO4:** Students review and learn different Testing Techniques used in SDLC. | **Global** |

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| **CC-12 Practical Software Engineering Lab** | |  |
| **CO1** | Students Study and analyse different Sample industry projects and try to implement some real-world projects. | Local |

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| **CC-13 Artificial Intelligence** | |  |
| **Unit -1** | **CO1:** Students develop a brief understanding of building blocks of AI and AI Agents. | **Global** |
| **Unit -2** | **CO2:** Analyse and comparative study about Problem Solving and Searching Techniques used in AI. | **Global** |
| **Unit -3** | **CO3:**  Familiarize with the Knowledge Representation Strategy in AI Agents. | **Global** |
| **Unit- 4** | **CO4:** Study about how to deal with Uncertainty and Inconsistencies by AI agents during Problem Solving. | **Global** |

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| **CC-13 Practical Artificial Intelligence Lab** | |  |
| **CO1** | Students implement different Numerical Problems using Prolog Program. | Local |

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| **CC-14 Algorithm Design Techniques** | |  |
| **Unit -1** | **CO1:** Build up knowledge about problem solving strategies used in Algorithms. | **Global** |
| **Unit -2** | **CO2:** Analyse and evaluate the performance of different searching and sorting Techniques. | **Global** |
| **Unit -3** | **CO3:** Comparison between different Algorithms of Greedy and Dynamic Programming Strategy. | **Global** |
| **Unit- 4** | **CO4:** Understanding fundamentals, Representation and Application of Graph Algorithms. | **Global** |

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| **CC-14 Practical Algorithm Design Techniques Lab** | |  |
| **CO1** | Students develop programs in C/C++ Language for different searching and sorting algorithms. | Local |
| **CO2** | Students solve some problems using Dynamic Programming in C/C++ Language. | Local |

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| **DSE-1 Numerical Techniques** | |  |
| **Unit -1** | **CO1:** Discuss the importance of Numerical methods and floating-point number system with errors. | **Global** |
| **Unit -2** | **CO2:** Illustrate different numerical methods to solve non-linear equations. | **Global** |
| **Unit -3** | **CO3:** Understand the concepts of different interpolation methods. | **Global** |
| **Unit- 4** | **CO4:** Apply different Numerical integration rules to find out the integration and also solve differential equations. | **Global** |

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| **DSE-1 Practical Numerical Technology Lab** | |  |
| **CO1** | Implement different Numerical methods by using programming languages. | Local |

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| **DSE-2 Unix Shell Programming** | |  |
| **Unit -1** | **CO1:** Comparison between Unix and Other Operating Systems, Feature and Architecture of Unix OS, Introduction to Commands. | **Global** |
| **Unit -2** | **CO2:** Familiarize with the File System and different User Management commands. | **Global** |
| **Unit -3** | **CO3:** Understand the existence of Shell, Shell Commands, Editors and its use in writing Shell Scripts. | **Global** |
| **Unit- 4** | **CO4:** Learn how to use Control Structures and Utilities in Shell Script. | **Global** |

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| **DSE-2 Practical Unix Shell Programming Lab** | |  |
| **CO1** | Students will develop the skills to write shell scripts. | Local |

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| **DSE-3 Data Science** | |  |
| **Unit -1** | **CO1:** Students will familiar themselves with the tools of Data Science. | **Global** |
| **Unit -2** | **CO2:** Data Science techniques will be learnt through the use of R programming. | **Global** |
| **Unit -3** | **CO3:** Students will learn **v**arious methods to obtain data from web as well as clean the data. | **Global** |
| **Unit- 4** | **CO4:** Learn statistical methods to analyse the data. | **Global** |

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| **DSE-3 Practical Data Science Lab** | |  |
| **CO1** | Students will implement different problems by using R programming language. |  |

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| **Course Outcomes** | **Program Outcomes** | | | | | | | |
| **PO 1** | **PO 2** | **PO 3** | **PO 4** | **PO 5** | **PO 6** | **PO 7** | **PO 8** |
| CC -I | 1 | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- II | **1** | **1** | **1** | **1** | **1** | **1** | **0** | **1** |
| CC- III | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- IV | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- V | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- VI | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- VII | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- VIII | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- IX | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- X | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- XI | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- XII | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- XIII | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| CC- XIV | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| DSE - 1 | **1** | **1** | **1** | **1** | **1** | **0** | **1** | **1** |
| DSE - 2 | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| DSE - 3 | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| Total | **17** | **17** | **17** | **17** | **17** | **16** | **16** | **17** |