

B.Sc. (Computer Science)

Under National Education Policy (NEP)

Program Outcome

PO No	Outcomes
PO1	Develop creative skills, critical thinking, analytical skills and research to address the real world problems using computational skills
PO2	Understand and apply mathematical foundation, computing and domain knowledge and develop computing models for defined problems
PO3	Understand software project management and computing principles with computing knowledge to manage projects in multidisciplinary environments
PO4	Illustrate the concepts of systems fundamentals, including architectures and organization, operating systems, networking and communication
PO5	Understand and apply the concepts of Digital Electronics, Computer Architecture, IoT etc.
PO6	Recognize the need for and develop the ability to engage in continuous learning as a Computing professional
PO7	Apply modern computing tools, skills and techniques necessary for innovative software solutions
PO8	Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations
PO9	Gain Self Discipline and commit Professional Ethics in global economic environment
PO10	Individual & Team Work: Ability to work as a member or leader in diverse teams in multidisciplinary environment
PO11	Identify opportunities, entrepreneurship vision and use innovative ideas to create value and wealth for the betterment of the individual and society

Course Objectives:

- To develop a thorough understanding of the core concepts and terminologies used in the computer science course.
- To follow industry needs by designing a B.Sc. computer science syllabus to include project-based learning and practical-oriented.
- To give exposure to the IT world through industrial visits and working on live projects.
- To learn in the environment of well-equipped laboratories with the latest software.
- To learn the tools, technologies, and software needed to become a top computer programmer.
- To analyse and solve problems using appropriate tools and technology.

Course Learning Outcome:

1. The program prepares the young professional through innovative learning methods like group discussions, case studies, and pair-and-share.
2. Students will be able to undergo instructor-led short-term courses to learn popular platforms and tools.
3. Students will be given the opportunity to learn certification courses for technologies that have high demand in industry.
4. The syllabus incorporates activities with case studies and assignments.
5. Subject teachers make frequent use of video lectures with descriptive contents.
6. Exposure to the global world through tours to Russia, Malaysia, Europe, etc.
7. Imparting life skills through yoga, sports, ethos, ethics, liberal arts, and essay competitions.

Course Outcome :

Course

1. **CS-101-T : Problem Solving Using C Programming**

Course Objectives

- To introduce the foundations of computing, programming and problem-solving using computers.
- To develop the ability to analyze a problem and devise an algorithm to solve it.
- To formulate algorithms, pseudocodes and flowcharts for arithmetic and logical problems.

- To understand structured programming approaches.
- To implement algorithms in the 'C' language.
- To test, debug and execute programs.

Course Outcomes

On completion of the course, student will be able to :

- Explore algorithmic approaches to problem solving.
- Control the sequence of the program and give logical outputs.
- Understand and manage Input /Output operations in 'C' program
- Develop modular programs using control structures and arrays in 'C'

2. CS-102-P : Lab Course based on CS-101-T

Course Objectives.

- Explore and develop the algorithmic approaches to problem solving.
- Understand and implement modular programs using control structures and arrays in 'C'.
- Implement programming logic and also test, debug and execute programs.
- Implement Control the sequence of the program and give logical outputs.

Course Outcomes:-

On completion of this course, students will be able to:

- Explore and develop the algorithmic approaches to problem solving.
- Understand and implement modular programs using control structures and arrays in 'C'.
- Implement programming logic and also test, debug and execute

programs.

- Implement Control the sequence of the program and give logical outputs.

3. **Matrix Algebra**

Course Objectives

- A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.
- A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning .
- A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical

Course Outcomes

Upon successful completion of this course, the student will be able to:

- Work with graphs and identify certain parameters and properties of the given graphs.
- Perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.
- Solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.
- Develop an appreciation for the literature on the subject and be able to read and present results from the literature.
- Write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

4. **Principles of Analog Electronics**

Course Objectives

- To study various types of semiconductor devices
- To study elementary electronic circuits and systems
- To study Instrumentation System
- To study various blocks of instrumentation System
- To study smart instrumentation system

Course Outcomes

- Understand the concept of semiconductor diodes.
- Understand the different applications of FET, BJT and MOSFET.
- Understand working principle of different sensors.
- Use Op-amp for different application.

5. MTC-101-T: Matrix Algebra

Course Objectives

- A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.
- A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning .
- A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical

Course Outcomes

Upon successful completion of this course, the student will be able to:

- Work with graphs and identify certain parameters and properties of the given graphs.
- Perform certain algorithms, justify why these algorithms work, and give

some estimates of the running times of these algorithms.

- Solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.
- Develop an appreciation for the literature on the subject and be able to read and present results from the literature.
- Write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

6. **ELC-101-T : Principles of Analog Electronics**

Course Objectives

- To study various types of semiconductor devices
- To study elementary electronic circuits and systems
- To study Instrumentation System
- To study various blocks of instrumentation System
- To study smart instrumentation system

Course Outcomes

- Understand the concept of semiconductor diodes.
- Understand the different applications of FET, BJT and MOSFET.
- Understand working principle of different sensors.
- Use Op-amp for different application.

7. **ELC-102-P : Electronics Practical Course I**

Course Objectives

- To study different semiconductor diodes.
- To understand applications of IC 555 as a multivibrator.

- To study different applications of op-amp.

- To understand applications of sensors

Course Outcomes

- Use different semiconductor diodes for various applications.
- Understand the different applications of FET, BJT and MOSFET.
- Use of different sensors for parameter measurement

8. OE-101-CS-T: Office Automation I

Course Objectives

- To introduce the foundations of office automation especially word processing.
- To develop the ability to prepare the well formatted word documents.
- To prepare the documents using word processing tools such as tables, figures, shapes etc.
- To prepare the word documents using advanced automated features.

Course Outcomes

On completion of the course, student will be able to :

- Prepare the professional word documents
- Explore various tools in the word processing software.
- Develop documents using word processing advanced tools.

9. SEC-101-CS-P : Statistical Methods for Computer Science I

Course Outcomes

On completion of the course, student will be able to :

- Present the complex data in tabular format.

- Use various diagrammatic and graphical techniques to represent statistical data and interpret the data.
- Compute various measures of central tendency, dispersion, skewness, and kurtosis using MS-Excel and interpret the results
- Establish relation between variables and estimate response for given bivariate data using software and interpret the results

10. **CS-151-T : Advanced C Programming**

Course Objectives

- To study advanced concepts of programming using the ‘C’ language.
- To understand code organization with complex data types and structures.
- To work with files.

Course Outcomes

On completion of the course, student will be able to :

- Develop modular programs using control structures, function ,pointers, arrays, strings and structures
- Design and develop solutions to real world problems using C.
- Understand and repeat the sequence of instructions and points for a memory location.
- Identification, analyzation, development, verify and document the requirements for a computing environment.

11. **CS-151-P : Lab Course based on CS-151-P**

Course Objectives

- To study advanced concepts of programming using the ‘C’ language.
- To understand code organization with complex data types and programming structures.

- To work with files and its types.

Course Outcomes

On completion of the course, student will be able to :

- Develop modular programs using function, pointers, arrays, strings and structures
- Design and develop solutions to real world problems using Advanced C programming.

12 **MTC-151-T: Graph Theory**

Course Objectives

- A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations , terminology and recognize basic geometrical figures and graphical displays, state important facts resulting from their studies.
- A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning .
- A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical

Course Outcomes

Upon successful completion of this course, the student will be able to:

- Work with graphs and identify certain parameters and properties of the given graphs.
- Perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.
- Solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.
- Develop an appreciation for the literature on the subject and be able to read and present results from the literature.

- Write cohesive and comprehensive solutions to exercises and be able to defend their arguments.

13 **ELC-151-T: Principles of Digital Electronics**

Course Objectives

- To learn different number system and their inter conversion.
- To understand logic gates and their applications.
- To study rules and laws of Boolean Algebra.
- To understand design of combinational circuit and their different types.

Course Outcomes

- 1. To learn different number system and their inter conversion.
- 2. To understand logic gates and their applications.
- 3. To study rules and laws of Boolean Algebra.
- 4. To understand design of combinational circuit and their different types

14. **ELC-152-P: Electronics Practical Course II**

Course Objectives

- To understand logic gates ICs and their applications in Digital Design.
- To design different digital circuits using logic gates.
- To study different combinational circuits.

Course Outcomes

- Understand the design and build of digital circuits using logic gates.
- Use breadboard / tag-board for building small electronic circuits.
- Design digital circuits for different applications.

- Validate observed outputs with expected theoretical outputs.

15. **OE-151-CS-T: Office Automation II**

Course Objectives

- To introduce the foundations of office automation especially Presentation Skills.
- To develop the ability to prepare the well formatted powerpoint presentations.
- To prepare the presentations using powerpoint presentation tools such as tables, figures, shapes, images, audio, video etc.
- To prepare the presentations using advanced automated features such as animation, slide shows, etc.

Course Outcomes

On completion of the course, student will be able to :

- Prepare the professional presentations
- Explore various tools in the powerpoint presentation software.
- Develop documents using powerpoint advanced tools.

B.Sc. (Cyber and Digital Science)

Program Outcome:

- To prepare students for professional work in business and industry as well as government and law enforcement.
- To develop a logical understanding of the subject.
- To strengthen the basics of the subject useful in selecting various career options.
- To make students aware of cyber crime and learn ways to handle them.
- To produce entrepreneurs who can work in the area of Cyber and Digital Forensics.
- To make students competent to apply their knowledge and skills to succeed in their career/ professional development and/or postgraduate education to pursue flexible career paths amidst future technological changes.

Program Specific Outcome:

- Students will apply basic principles and practices of computing grounded in Cyber Security and Digital Science.
- Students will demonstrate a sense of societal and ethical responsibility in their professional endeavors, and will remain informed and involved as full participants in our profession and our society.
- Our graduates will demonstrate strong communication skills and the ability to function effectively in multi-disciplinary teams.
- Our graduates will demonstrate strong bonding in team and display distinct leadership traits.

Semester-I

Course Title:CDS-111: Introduction to Computers and Problem Solving

Course Outcomes:-

- Learn the fundamental concepts of Problem Solving.
- Develop the logic of problem-solving.
- Ability to analyze a problem and devise an algorithm to solve it.
- Able to formulate algorithms, pseudo-codes, and flowcharts for arithmetic and logical problems.

Course Title:CDS-112: Python Programming

Course Outcomes:

- Able to use python programming elements to solve and debug simple logical problems.
- Ability to code with the various control statements in Python.
- Develop Python programs using functions and strings.
- Develop python programs to implement various file operations and exception handling.

Course Title: CDS-113: Basic Mathematical Techniques

Course Outcomes:

- Express mathematical properties via the formal language of propositional logic.
- Acquire the ability to describe computer programs in a formal mathematical manner.
- Apply basic counting techniques to solve combinatorial problems.
- Apply a variety of methods for explaining, summarizing and presenting data, and interpreting results.
- Apply concepts of graphs and trees to tackle real situations such as connectivity and constraint satisfaction.

Course Title: - CDS-114: Basic Statistical Techniques for Computer Science

Course Outcomes:

- To compute and interpret various summary statistics.
- To compute the correlation coefficient and regression coefficients and interpret them.
- To interpret the nature of different types of probability distributions.
- To use probability distributions for understanding the nature of a given data.
- To statistically test various hypotheses and make decisions.

Course Title: CDS-115: Lab Course on Introduction to Computers and Problem-Solving

Course Outcomes:-

- Able to understand and apply the steps for installing Windows and Linux Operating Systems.
- Basic Understanding of DOS and Networking Commands.
- Able to connect network devices with proper settings.

Course Title: CDS-116 Lab Course on Python Programming

Course Outcomes:

- Develop and implement programs by making use of built-in data structures.
- Design and implement programs to solve real-world problems.
- Able to handle File and its related operations.

Course Title: CDS-117 Lab Course on Basic Mathematical Techniques

Course Outcomes:-

- Able to develop foundational mathematical concepts.
- Able to understand different algorithms.
- Able to understand Graph Theory.
- To formulate problems precisely and solve the problems.
- To test various hypotheses of significance.

Course Title: CDS-118: Lab Course on Basic Statistical Techniques For Computer Science

Course Outcomes:-

- Ability to understand the basic concepts of probability.
- Able to understand the concept of linear and Non-linear Regression.
- To introduce to the students some of the probability distributions, their shapes, properties, and applications in real life.