DEPARTMENT OF COMPUTER APPLICATIONS

B.C.A-NEP

PROGRAM OUTCOMES (POs)

PO1 : Computing Knowledge
Will acquire theoretical foundation in Computer Science and obtain insights about computer organisation, operating systems and system programming.

PO2 : Problem Analysis & Programming Skills
Will learn to design data structures, develop efficient algorithms for a software problem and implement them using practical programming skills.

PO3 : Database Management & Software Application Development
Will be able to design and manipulate databases; will understand the software/application development process and develop software solutions.

PO4 : GUI Design & Visual Programming Skills
Learns object oriented and visual programming skills and learn event driven programming.

PO5 : Web Application Development
Acquires skills in Java and other web technologies and develop web applications and web portals.

PO6 : Mathematical Foundation & Basic Accounting Skills
Acquires sound knowledge of mathematics, and other domains for building computing models for complex computing problems.

PO7 : Networking Knowledge
Will understand the concepts of networking, data communication and network security.

PO8 : Specialisation in relevant current technologies
Obtain insights in niche technologies through advanced courses like AI and elective courses.

PO9 : Soft Skill & Personality Development
Learns soft skills and becomes confident to compete in a challenging work environment.

PO10 : Language & Communication Skills
Will acquire literary sensibility, proficiency in Language grammar and communication skills.

Will learn the art of professional business communication.

PO11 : Socially Responsible IT Professionals

Will learn ethical values, become aware of his social responsibilities and function effectively as an individual/member/leader in diverse teams in IT /multidisciplinary environments.

PO12 : Innovations in IT

Identifies a timely opportunity and develops innovative IT solutions for diverse industries and betterment of the society at large.

PROGRAMME SPECIFIC OBJECTIVE

PSO 1 : The students will be having a strong foundation in computer science with subjects like Computer Organization, Operating Systems, Systems Programming, Data Communications and Networking, Software Engineering and Artificial Intelligence.

PSO 2 : The students will have Database design and manipulation skills, Software design and development skills and learn to develop Object Oriented, GUI and Web applications.

PSO 3 : Students will have skills in current and niche technologies through Elective courses in Big Data, Cloud Computing, Mobile Computing and Mining.

DEPARTMENT OF COMPUTER APPLICATIONS

B.C.A-NEP

I SEM BCA

CA-C1T: DISCRETE STRUCTURE

CO1: Demonstrate a working knowledge of set notation and elementary set theory, recognize the connection between set operations.

CO2: Comprehend and Evaluate rigor in the definitions and conclusions about mathematical models and identify fallacious reasoning and statements.

CO3: Apply properties of combinatorial structures and properties - know the basic techniques in combinatorics and counting.

CO4: Gain the conceptual background needed to be able to identify Graph structures and discover, prove and use properties about them.

CA-C2T: PROBLEM SOLVING TECHNIQUES

CO1: To understand the concept of Problem solving and steps involved in algorithm development.

CO2: Recognize the basics of Computer Programming Concepts using C Programming Language.

CO3: Explain the concept of C character set, identifiers and keywords, variable different data types, operators and programming constructs.

CO4: Apply the concept of advanced topics like Arrays, Functions, Pointers, Structures, Unions.

CO5: Design programs involving decision structures, loops and functions.

CO6: Acquire knowledge about how to describe and implement arrays.

CA-C3T: DATA STRUCTURE

CO1: Understand the concepts of data structure and operation on it

CO2: Apply data structure algorithms on real-world situations

CO3: Analyze the complexity in terms of time and space and determine the best approach in solving real-world problem.

CO4: Evaluate the data structure algorithm techniques based on specific applications.

CA-C4L PROBLEM SOLVING LAB

CO1: Apply branch and bound method to solve problem.
CO2: Understand and apply the looping, sorting and allocation techniques and use of algorithms for dealing with variety of problems.
CO3: Formulate conditional and iterative statements to write C programs.
CO4: Analyze the concept of pointers and structures to write c programs
C05: Conceive and Design the C programs that use arrays, strings, concept of modularization and user defined functions, structures and unions

CA-C5L: DATA STRUCTURE LAB

CO 1: Implement different techniques related to sorting and searching.
CO 2: Create different data structures and perform different operations on it.

OE1 : (Open Elective) WRITING FOR MEDIA

CO1 : Students are familiar with writing for media.
CO2 : Students are equipped with new trends in media writing.

SEC1 : ENVIRONMENTAL SCIENCE

CO1: Demonstrate of core ecological and physical science concepts and methods as they pertain to environmental problem-solving.
CO2: Demonstrate of core social science concepts and methods as they pertain to environmental problem-solving.
CO3: Recognize and integrate the international, cross-cultural, and transdisciplinary nature of environmental problems in analyses and solutions.
CO4: Produce a culminating/multi-scale piece of work demonstrating the ability to synthesize concepts and methods to make a contribution to environmental solutions.
CO5: Apply proficiency in analytical methods, critical thinking, communication, and leadership skills sufficient to make a contribution in environmental and related fields.

II SEM BCA

CA-C6T: COMPUTER ARCHITECTURE

CO1 : Understand Number Systems and Arithmetic :

Students will grasp binary ,octal and hexadecimal number systems as well as basic arithmetic operations used in computer design

CO2: Comprehending Computer Structure and Design :

Students will grasp the basic organizational concepts of computers including functional units, Von-Neumann architecture and bus structures. They will understand the structure of CPU, addressing modes, instruction formats and different complex instructions like CISC and RISC

CO3 : Mastering Register transfer and Micro-operations :

Students will demonstrate proficiency in register transfer language ,bus and memory transfers and various arithmetic and logic micro-operations .They will comprehend the design and implementation of micro-programmed control units ,including control memory address sequencing and micro-program examples

CO4 : Understanding Memory Systems and Multiprocessing :

Students will learn about memory hierarchies ,types of memory and multiprocessing architectures ,including their characteristics and performance considerations

CA-C7T: OBJECT ORIENTED PROGRAMMING USING JAVA

CO1: Apply the concept of advanced topics like Arrays, Functions, Pointers, Structures, Unions.

CO2: Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.

CO3: Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.

CO4: Design event driven GUI and web related applications which mimic the real word scenarios.

CA-C8T: DATABASE MANAGEMENT SYSTEM

CO-1 : Understand the different issues involved in the design and implementation of a database system

CO-2 : Study the physical and logical database designs, database Modelling.

CO-3: Understand and use data manipulation language to query, update, and manage a database

CO-4: Develop an understanding of essential Properties of DBMS concepts such as: database security, integrity, concurrency

CA-C9L: JAVA LAB

CO1: Write basic Java applications and Create classes, objects and apply Inheritance.

CO2: Create Packages and build applications using default packages.

CO3: Manage Exceptions and develop multithreaded applications.

CO4: Learn the Internet Programming, using Java Applets.

CO5: create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT)

CA-C10L: DATABASE MANAGEMENT SYSTEM LAB

CO1. Understanding and Applying Database Structures (Remembering, Understanding

CO2. Execution and Evaluation of SQL Queries(Analyzing, Designing, and Evaluating Realworld Database Scenarios)

OE2: SEC1-OMT OFFICE MANAGEMENT TOOLS

CO1 : Hands-on introduction to the personal computer and application software

CO2 : Understanding of why computers are essential components in business, education and society.

CO3 : Provide hands-on use of Office applications Word, Excel, Access and PowerPoint.

CO4: Understanding types of data, data cleaning, recoding and sorting, data visualization, summarizing data and an introduction to analysis of relationships between variables.

AECC : ENVIRONMENTAL SCIENCE

CO1 : Articulate the interconnected and interdisciplinary nature of environmental studies

CO 2: Demonstrate an integrative approach to environmental issues with a focus on sustainability

CO 3: Use critical thinking, problem-solving, and the methodological approaches of the social sciences, natural sciences, and humanities in environmental problem solving

III SEM BCA

CA-C11T: OPERATING SYSTEMS

CO1: Students will learn how Operating System is Important for Computer System and To make aware of different types of Operating System and their services.

CO2: This will introduce the core concepts of operating systems, such as process management, Inter process communication, multithreading and multicore programming.

CO3: To learn synchronization techniques to achieve better performance of a computer system. It aims to resolve the problem of race conditions and other synchronization issues in a concurrent system.

CO4: To learn and analyse different process scheduling algorithms that impacts the performance and user experience of computer systems. To learn Optimization of the use of resources present and have maximum utilization of the CPU.

CO5: To Understand what deadlock is and how it can occur when access to multiple resources are given and to learn several approaches to mitigating the issue of deadlock in operating systems.

CO6: To analyze and understand memory management schemes and strategies. To Appreciate the need for memory management in OS, understand the limits of fixed memory allocation schemes.

CO7: To know virtual memory concepts and secondary memory management. To learn the importance for improving system performance, multitasking and using large programs.

CO8: To understand I/O management and File systems. To learn file allocation methods and file access methods inside the system.

CO9 : To learn organizing and maintaining the storage on a computer's hard disk. To explorte the disk scheduling algorithm and learn to select a disk request from the queue of IO requests and decide the schedule

CO10: To be familiar with the basics of all types of operating system like Linux system, Windows, Mobile OS like iOS and Android.

CA-C12T: COMPUTER NETWORKS

CO1 : To understand computer network basics
CO2: To develop and understand different components of networks, various protocols, modern Technologies and their applications

CA-C13T: PYTHON PROGRAMMING

CO 1: To understand why Python is a useful scripting language for developers and to design and program Python applications, learn how to write loops and decision statements in Python, and use indexing and slicing to access data in Python programs.

CO 2: To learn how to use lists, tuples, set and dictionaries in Python programs and study about frozen set and zip() function.

CO 3: Describe on how to design object oriented programs in Python such as inheritance, Encapsulation, and polymorphism and usage of file concept in python.

CO 4: Study on how to visualize data and working with Application Programming Interface.

CA-C14L COMPUTER NETWORKS LAB

CO1 :Evaluate the performance of a network
CO2 :Understand the basics of how data flows from one device to another

CA-C15L: PYTHON PROGRAMMING LAB

CO 1: To teach about the basic data types of python, list operations, tuples and dictionary methods.

CO 2: How to create menu programs, and usage of filter method, date and time handling.

CO 3 :To make the students to understand string and its related operations such as checking occurrences of characters in a file etc.,

CO4: To demonstrate significance of numpy module, pandas module, matplotlib and its roles in python programs.

CO 5: To denote CSV file usage in python language and how it can be imported using pandas or numpy or matplotlib.

SEC II : COMPUTER ASSEMBLY AND REPAIR

CO1. Understanding of Computer Hardware Components:

Students will be able to identify, describe, and explain the function of various computer hardware components, including the motherboard, CPU, RAM, storage devices, power supply, and peripherals.

CO2. System Configuration and Troubleshooting:

Students will be able to configure BIOS/UEFI settings, install operating systems, and perform initial system setup. They will also be able to troubleshoot common hardware issues and perform basic repairs.

OE3 : OPEN ELECTIVE ENTREPRENEURSHIP SKILLS

CO 1 Discover their strengths and weaknesses in developing the entrepreneurial mind-set.
CO 2 Familiarize themselves with the mechanism of setting up, monitoring and maintaining an Enterprise.
CO 3 Understand the various procedures for setting up the Startups in India
CO 4 Understand the role of Government in supporting entrepreneurship

IV SEM BCA

CA-C16T SOFTWARE ENGINEERING

CO1 :Introduction to Software Engineering:
Select and implement different software development process models

CO2.Formal Modeling and verification
Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.

CO3.Software testing strategies:
Apply different testing and debugging techniques and analyzing their effectiveness

CO4.Software Project Scheduling
Basic concepts of project scheduling, risk identification, various software maintenance methods and issues

CO5.Software Process Improvement (SPI)
Approaches to software process improvement and basic concepts of SCM

CA-C17T ARTIFICIAL INTELLIGENCE

CO 1. Understand the various characteristics of problem solving agents and apply problem solving through search for AI applications.

CO 2. Appreciate the concepts of knowledge representation using Propositional logic and Predicate calculus and apply them for inference/reasoning.

CO 3. Obtain insights about Planning and handling uncertainty through probabilistic reasoning and fuzzy systems.

CO 4. Understand basics of computer vision and Natural Language Processing and understand their relevance in AI applications.

CO 5. Obtain insights about machine learning, neural networks, deep learning networks and their significance.

CA-C18T INTERNET TECHNOLOGIES

CO1: Understand the architecture and components of the Internet and the World Wide Web, including various Internet organizations, services, and applications

CO2: Demonstrate knowledge of the communication protocols used on the Internet, such as HTTP, HTTPS, and various aspects related to them

CO3: Understand the evolution of the Web, from Web 1.0 to Web 2.0, including Big Data and Web Information Retrieval. They will also acquire hands-on experience in developing web applications using both client-side (HTML, CSS, JavaScript, Bootstrap, AngularJS) and server-side (PHP, Node.js) technologies

CO4: Analyze and evaluate web application frameworks such as Django and Ruby on Rails and gain knowledge of web databases, including SQL and NoSQL databases

CA-C20L INTERNET TECHNOLOGIES LAB

CO1: Utilize various email functionalities, including sending, receiving, and forwarding emails, and demonstrate proficiency in organizing and conducting online meetings using platforms like Zoom and Google Meet.

CO2: Design and create web pages and forms using HTML and various input tags, such as text boxes, multiline text boxes, option buttons, and checkboxes, while demonstrating an understanding of table tags and frames.

CO3: Develop web pages that incorporate multiple types of stylesheets, as well as employ JavaScript to create dialog boxes and perform form validations.

CO4: Apply the acquired web development skills to create a website for a realworld scenario, such as developing a college website

OE4 : Open Elective : FINANCIAL EDUCATION AND INVESTMENT AWARENESS

CO1 : To understand the basic concepts of finance, identify and classify simple compound interest and also describe the valuation of security.

CO2 : To remember the facts and basic essential concepts of investment avenues and to discuss stock market concepts

CO3 : Gain insights on mutual funds, the pros and cons and major fund houses in India.

AECC :THE CONSTITUTION OF INDIA

CO1 : Understanding the philosophy of the constitution and its structure

CO2 : Measuring the powers and functions of various powerful people of government

CO3 : To understand and appreciate the role of constitution in democracy

V SEM BCA

CA-C17T DESIGN AND ANALYSIS OF ALGORITHM

CO1: Understand the basic notation for analyzing the performance of the algorithms.

CO2: Use divide-and-conquer, decrease and conquer and brute force method techniques for solving suitable problems

CO3: Use greedy approach, dynamic programming and space and time-tradeoffs to solve an appropriate problem for optimal solution.

CO4: Understand the limitations of algorithm power and study how to cope with the limitations of algorithm power for various problems

CA-C22T DATA ANALYTICS

CO1: Explore the fundamental concepts of data analytics

CO2: Recognize and conduct statistical inference to solve engineering problems.

CO3: Summarize and present data in meaningful ways

CO4: Form testable hypotheses that can be evaluated using common statistical analyses

CA-C23T: WEB PROGRAMMING

CO1: Understand the basics of Web Programming concepts
CO2: To build dynamic web pages with validation using JavaScript objects and by applying different event-handling mechanisms.
CO3: Analyze various PHP library functions that manipulate files and directories.
CO4: To develop modern interactive web applications using PHP and XML./

CA-C24L: DATA ANALYTICS LAB

CO1: Use advanced functions and productivity tools to assist in developing worksheets. Manipulate data lists using Outline, Autofilter and PivotTables. Use Consolidation to summarise and report results from multiple worksheets. Record repetitive tasks by creating Macros.

CO2: Python is known for its simple syntax and readability, which is a major benefit. It cuts down the time data analysts otherwise spend familiarising themselves with a programming language. The gentle learning curve makes it stand out among old programming languages with complicated syntax.

CO3: Understand basic concepts and terminology of the Power BI service. Find your content in dashboards, reports, and apps. View and export data from dashboards and reports. View filters that are used in a report.

CA-C19L DESIGN AND ANALYSIS OF ALGORITHM LAB

CO1: Develop programs for sorting a given set of elements and analyse its time complexity.
CO2: Solve and analyse the problems using greedy methods.
CO3: Solve and analyse the problems using dynamic programming.
CO4: Apply backtracking method to solve various problems.
CO5: Apply branch and bound method to solve problem.

CA-C25L: WEB PROGRAMMING LAB

CO1: Develop an HTML Form, which accepts any Mathematical expression,a JavaScript code to find the sum of N natural Numbers
CO2: Creating java script code for form,block using array,page with dynamic effect
CO3: Create a form for Employee information,a JavaScript code to find the sum of N natural Numbers

CO4: Write a program in PHP to change background color based on day of the week using if else if statements and using arrays ,patterns, removing duplicate element

CA-VI VOCATION COURSE I : QUANTITATIVE TECHNIQUES

CO1: Solve the problems easily by using Short-cut method with time management which will be helpful to them to clear the competitive exams for better job opportunity

CO2: Analyze the Problems logically and approach the problems in a different manner.

CO3: Develop general awareness about teaching and learning processes in higher education system.

CO4: Develop cognitive abilities, which include comprehension, analysis, evaluation, understanding the structure of arguments, deductive and inductive reasoning.

3.CA-E1: Elective I :

A.   DATA MINING

CO1: Data Mining Techniques

CO2: Students should be able gain knowledge on different data classification techniques in data mining like Stastical based algorithms, and distance based algorithms.

Co3: Students should gain knowledge on different clusterning techologies like hierachial, aglomerative, partitional algorithms,k-means and nearesh neighbors algorithms

Co4: Students should gain knowledge on Association Rules algorithms like basic algorithms and parallel & Distributed Algorithms

B. COMPUTER GRAPHICS

CO1 :Computer Graphics,its applications and display devices

CO2 : Understanding of algorithms to generate different output primitives

CO3 : 2D Geometry transformation and Homogenous coordinates

CO4 : Window and viewport

CO5 :Understanding of clipping algorithms 3D Coordinate system, transformations and segments

CO6 : Graphics Input devices and techniques

SEC III : CYBER CRIME, CYBER LAW, AND INTELLECTUAL PROPERTY RIGHT

CO1 : Understand cyber crimes, their nature, legal remedies and as to how report the crimes through available platforms and procedures.

CO2 :Recognize various privacy and security concerns on Social media and e-commerce platforms.

CO3 :Use basic tools and technologies to protect their devices

CO4 : Understand digital environment and IPR issues

VI SEM BCA

CA-C27T MACHINE LEARNING

CO1: Learn the basics of machine learning, understanding its uses, challenges, and various applications.

CO2: Build practical data skills, covering data collection, analysis, visualization, and preparation.

CO3: Become skilled in using classification and regression algorithms, including selecting, training, and evaluating models.

CO4: Dive into advanced clustering and specialized applications, using methods like KMeans, DBSCAN, and others.

CA-C26P: CA-V2 VOCATION COURSE II: : ELECTRONIC CONTENT DESIGN

CO1 :To deliver the content via various media such as radio, television, computer etc.

CO2 :To increase students%u2019 concentration on particular subject matter in depth learning

CO3 :To feel emotionally good with joyful learning and active learning involvement of students during the content delivery

CO4 :To reuse many time the content to various group of same class without hesitate and unchanging.

CO5 :To handle easy to the facilitators during the content delivery.

CO6 : To modify the content with present time needs.

3CA-E2 ELECTIVE II :
A. OPERATIONS RESEARCH

CO1:Formulation of optimization model and applying appropriate optimization techniques for decision making.

CO2:Solve linear programming problems using appropriate optimization techniques.

CO3:Finding the optimal strategy for Minimization of Cost of shipping of products from source to Destination.

CO4:Optimizing the allocation of resources to Demand points in the best possible way.

B. SOFTWARE TESTING

CO1 : Differentiate the various testing techniques
CO2 :Derive Test Cases for any given problem.
CO3 : Classify the problem into suitable testing models.
CO4 : Apply a wide-variety of testing techniques in an effective and efficient manner.
CO5 : Explain the need for planning and monitoring a process

CA-C28T MOBILE APPLICATION DEVELOPMENT

CO1: Understand the basic concepts of Mobile application development

CO2: Design and develop user interfaces for the Android platforms
CO3: Apply Java programming concepts to Android application development and create an application using database

CA-C29L MACHINE LEARNING LAB
CO1. Achieve proficiency in setting up Python, installing vital libraries, and configuring essential tools.

CO2. Demonstrate competence in data manipulation, dataset loading, and the creation of insightful visualizations.

CO3. Exhibit the ability to preprocess data, address missing values, perform categorical encoding, and implement fundamental machine learning algorithms.   CO4. Develop an

understanding of clustering techniques, create cluster visualizations, and interpret decision tree splits

CA-C30L MOBILE APPLICATION DEVELOPMENT LAB

CO1: Adaptation to Device Orientation

CO2: User Interface Design and Implementation

CO3: Activity and Data Handling via Intents

CO4: Custom UI Design

CO5: Data Management and Communication

CO6: Integration of Location Services