

Department of Computer Science

BACHELOR OF COMPUTER APPLICATIONS

PROGRAM LEARNING OUTCOMES (PLOs)

PLO-1: An ability to apply knowledge of mathematics, science, computer science fundamentals to the solution of complex real world problems.

PLO-2: An ability to identify, formulate, research literature, and analyze complex real world problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PLO-3: An ability to design solutions for complex computer domain problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PLO-4: An ability to investigate complex real world problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data, and synthesis of information to derive valid conclusions.

PLO-5: Ability to design, analyze and develop the computing systems using modern tools by considering the limitations.

PLO-6: An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.

PLO-7 : An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PLO-8: An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.

PLO-9: An ability to understand the need, for and have the preparation to absorb in independent and long-term learning in context to technological updates.

PLO-10: An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.

PLO-11: An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PLO-12: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.

SEMESTER-I

BASICS OF COMPUTER SCIENCE	
Course Code: 21BCA101	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO1: Demonstrate a basic understanding of computer hardware and software.

CLO2: Demonstrate basic understanding of network principles

CLO3: Understand the dynamics of an office environment

Digital Logic Fundamentals	
Course Code: 21BCA103	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand concepts of code conversion and applications of logic gates.

CLO 2: Demonstrate the various simplifications of Boolean functions with help of K-map

CLO 3: Improve their ability to apply combinational circuits in real world problems.

CLO 4: Comprehend different mechanisms related to sequential logic and registers.

CLO 5: Equip themselves to design counters and memories

INTRODUCTION TO PROGRAMMING LANGUAGE WITH C	
Course Code: 21BCA104	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge in C programming and developing programming skills.

CLO 2: Demonstrate an ability to use control flow statements.

CLO 3: Implement several functions using classes and recursion.

CLO 4: Apply single dimensional and multi-dimensional array along with union and bitwise operations.

FUNDAMENTAL MATHEMATICS	
Course Code: 20CA109	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Find rank, Eigen vale and Eigen vector of matrices.
- CLO 2: Expand trigonometrical expressions.
- CLO 3: Know successive Differentiation.
- CLO 4: Calculate different type of integrals.
- CLO 5: Well versed with applications of differential and integral calculus.

DIGITAL LOGIC FUNDAMENTAL LAB	
Code: 21BCA153	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA103	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Understand the concept of logic gates and verify truth tables using bread board.
- CLO 2: Construct different types of combinational circuits using basic gates
- CLO 3: Equip them to design 4-Bit Binary Adder / Subtractor using basic gates
- CLO 4: Demonstrate different types of Multiplexers/Demultiplexers.
- CLO 5: Able to understand concept of latches, register and counters

C PROGRAMMING LAB	
Code: 21BCA154	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA104	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Inculcate skills of using searching and sorting techniques for solving real world applications.
- CLO 2: Learn and understand the mapping and interaction among various components.

SEMESTER - II

ENGLISH COMMUNICATION	
Course Code: 21AEEN201	
Credits: 4	
L T P: 4 0 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be:

CLO 1: Able to seamlessly communicate in standard English – written & spoken

CLO 2: Able to analyse texts on various parameters expected/demanded during different situations and circumstances

CLO 3: Able to conduct basic research on a topic (pertaining to their discipline/workplace)

CLO 4: Able to prepare basic/preliminary research documents, official documents and deliver presentations on a given topic

CLO 5: Able to understand and analyse the time, history, circumstances, polity, society, economy that influences any kind of writing and its subsequent production

Environmental Studies	
Course Code: 21ESUG201	
Credits: 4	
L T P: 3 1 0	
Prerequisite: Basic understanding about earth and Environment	

COURSE LEARNING OUTCOMES (CLOs)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able

CLO 1: To develop an awareness about our environment and elicit collective response for its protection.

CLO 2: To know and analyze the physical, chemical, and biological components of the earth's systems and their function.

CLO 3: Understanding about cause of Environmental pollution and prevention.

CLO 4: Understanding about Natural resources, Climate change and Sustainable development

OBJECT ORIENTED PROGRAMMING USING C++	
Course Code: 21BCA204	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : 21BCA104	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge about iostream classes and manipulators.

CLO 2: Demonstrate an ability to use various I/O functions.

CLO 3: Implement several functions using classes and access specifiers.

CLO 4: Apply overloading concepts and operators to perform mathematical functions..

CLO 5: Understanding implementation of file processing.

DISCRETE MATHEMATICS	
Course Code: 21BCA205	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite :NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Able to Understand set theory, functions, relations and the concepts of theorem proving

CLO 2: Understand concepts of logic and various inference mechanisms using logic

CLO 3: Demonstrate the various simplifications of generating functions

CLO 4: Understand and apply graph theory and concepts of recurrence relation in system modeling

CLO 5: Equip themselves in algebraic structure

ELEMENTARY MATHEMATICS	
Course Code: 21CA016	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Solve problems in descriptive statistics.

CLO 2: Get exposed to basic statistical concepts of probability.

CLO 3: Thorough with basics of probability, discrete & continuous distribution.

CLO 4: Differentiate correlation and regression analysis.

CLO 5: Explain testing of hypothesis.

OOPS LAB	
Code: 21BCA254	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA204	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: The student will inculcate skills of using classes and objects for solving real world applications.

CLO 2: Learn and understand the mapping and interaction among various components for solving complex problems.

OFFICE AUTOMATION LAB	
Course Code: 21BCA252	
Credits: 1	
L T P : 0 0 2	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To demonstrate a basic understanding of computer hardware and software.

CLO 2: To understand the dynamics of MS word

CLO 3: To understand the dynamics of MS power point

Live Project - I	
Course Code:21BCA271	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : 21BCA204	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Show preparedness to work independently on real time problem scenarios to be addressed using knowledge of fundamentals, techniques, programming languages and tools in the area of Computer Science.

CLO 2: Use the innovative ideas and thoughts to address real life issues and provide efficient solutions for process oriented works.

CLO 3: Practice and develop skills in time management and reporting within an industrial or research laboratory setting.

CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams

CLO 5: To build the confidence in report writing.

EFFECTIVE COMMUNICATION SKILLS	
Course Code: 21SS251	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : Basic English	

Training Learning Outcomes (TLO): -

After the completion of the training, the student will have ability:

CLO 1: To communicate effectively and interact with people with confidence.

CLO 2: To demonstrate and differentiate between various forms of communication.

CLO 3: To apply effective communication skills confidently which a student need to get ahead in job and life.

SEMESTER - III

DATA STRUCTURE USING C	
Course Code:21BCA301	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : 21BCA104	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: To gather extensive knowledge about data structures, pointers and arrays.
- CLO 2: Demonstrate an ability to use stacks and queues.
- CLO 3: Implement several functions using singly and doubly linked list.
- CLO 4: Apply concepts of trees to solve various real world problems.
- CLO 5: Understanding implementation of searching and then sorting those problems.

COMPUTER SYSTEM ARCHITECTURE	
Course Code: 21BCA302	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
- CLO 2: Analyse the performance of commercially available computers.
- CLO 3: To develop logic for assembly language programming.
- CLO 4: Analyze the performance of each memory
- CLO 5: Demonstrate computer architecture concepts related to I/O

OPERATING SYSTEMS	
Course Code: 21BCA303	
Credits: 4	
L T P : 4 0 0	
Prerequisite: 21BCA101	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Identify basic components of operating system.
- CLO 2: Conceptualize synchronization amongst various components of a typical operating system.
- CLO 3: Understand and simulate activities of various operating system components.
- CLO 4: Correlate basic concepts of operating system with an existing operating system.

CLO 5: Demonstrate an ability to apply design and development principles in the construction of software systems of varying complexity.

DATABASE MANAGEMENT SYSTEM	
Course Code: 21BCA304	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.

CLO 2: Comprehend architecture of DBMS, conceptual data modelling, logical data base design and physical database design.

CLO 3: Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.

CLO 4: Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.

DATA STRUCTURE USING C LAB	
Code: 21BCA351	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA301	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: The student will inculcate skills of using searching and sorting techniques for solving real world applications.

CLO 2: Learn and understand the mapping and interaction among various components for solving complex problems.

OPERATING SYSTEMS LAB	
Course Code: 21BCA353	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA303	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Exposure to different OS

CLO 2: Awareness of concepts of multiprogramming, multithreading and multitasking

CLO 3: Demonstration of memory management algorithms.

CLO 4: Demonstration of file-handling concepts by implementing suitable algorithms

CLO 5: Awareness of computational issues, resources in distributed environment.

DATABASE MANAGEMENT SYSTEM LAB	
Code: 21BCA354	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA304	

COURSE LEARNING OUTCOMES (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.

CLO 2: Comprehend architecture of DBMS, conceptual data modelling, logical database design and physical database design.

CLO 3: Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.

CLO 4: Analyze the Information Systems as socio-technical systems, its need and advantages as compared to traditional file based systems.

Live Project - II	
Course Code:21BCA371	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : 21BCA204	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Show preparedness to work independently on real time problem scenarios to be addressed using knowledge of fundamentals, techniques, programming languages and tools in the area of Computer Science.

CLO 2: Use the innovative ideas and thoughts to address real life issues and provide efficient solutions for process oriented works.

CLO 3: Practice and develop skills in time management and reporting within an industrial or research laboratory setting.

CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams

CLO 5: To build the confidence in report writing.

TEAMWORK & INTERPERSONAL SKILLS	
Course Code: 21SS352	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : NIL	

Training Learning Outcomes (TLO): -

After the completion of the training, the students will have ability:

CLO 1: To be confident working in a team and leading it as well.

CLO 2; To categories the work and achieve expected performance within the time frame & will be able to adapt himself to work under various kinds of stress and re-energies himself to bounce back from such situations.

CLO 3: To get benefitted from Emotional Quotient in building stronger professional relationships and achieving career and personal goals.

CLO 4: To face complex problems and effectively deal with it in the job due to Critical Thinking & Problem Solving Skills.

SEMESTER - IV

Scripting Languages & Web Technology	
Course Code:21BCA401	
Credits: 3	
L T P : 3 0 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Design a basic web site using HTML5 and CSS3 to demonstrate responsive web design.

CLO 2: Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism.

CLO 3: Use AJAX Programming Technique to develop RIA and Build well-formed XML Document and implement Web Service using Java.

CLO 4: Develop simple web application using server side PHP programing and Database Connectivity using MySQL and Demonstrate simple web application using Python Django Framework

CLO 5: Develop simple web application to consider both client and server side programming scripting

MULTIMEDIA AND APPLICATIONS	
Course Code: 21BCA402	
Credits : 3	
L T P: 3 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge about key elements of multimedia.

CLO 2: Demonstrate an ability to use publishing software.

CLO 3: Implement several functions using web based multimedia.

CLO 4: Apply concepts of kiosks to attract various real world problems.

CLO 5: Understanding implementation of project and process in multimedia.

JAVA PROGRAMMING	
Course Code: 21BCA403	
Credits: 3	
L T P : 3 0 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Discuss the principles of inheritance, interface and packages and demonstrate through problem analysis assignments how they relate to the design of methods, abstract classes and interfaces and packages.

CLO 2: Understand importance of Multi-threading & different exception handling mechanisms.

CLO 3: Identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.

CLO 4: Demonstrate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

CLO 5: Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.

Data Communication & Networks	
Course Code: 21BCA404	
Credits : 3	
L T P: 3 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Able to understand the functions of various layers in network reference model.

CLO 2: Demonstrate about Intranet and its applications

CLO 3: Ability to understand and analyze different routing algorithms

CLO 4: Ability to design of wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs) based on available network devices.

CLO 5: Comprehend different mechanisms related to private networks and switching technology.

Design and Analysis of Algorithm	
Course Code: 21BCA405	
Credits: 3	
L T P : 3 0 0	
Prerequisite: 21BCA301	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP).

After completion of course, students would be able to:

CLO 1: Analyse the complexity of polynomial algorithms.

CLO 2: Apply various design strategies for solving problems

CLO 3: Distinguish NP hard and NP complete problems from other problems

Scripting Languages & Web Technology Lab	
Code:21BCA451	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA401	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism and Demonstrate simple web application using Python Django Framework

CLO 2: Use AJAX Programming Technique to develop RIA

CLO 3: Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanism and Demonstrate simple web application using Python Django Framework

CLO 4: Develop simple web application using server side PHP programing and Database Connectivity using MySQL.

CLO 5: Build well-formed XML Document and implement Web Service using Java

JAVA LAB	
Course Code: 21BCA453	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA403	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: The student will inculcate skills of using classes and objects for solving real world applications.

CLO 2: Learn and understand the mapping and interaction among various components for solving complex problems.

Design and Analysis of Algorithm Lab	
Code:21BCA455	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA405	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Implementing Linear search and Binary search

CLO 2: Sorting and Searching Techniques

CLO 3: Kruskal's algorithm and KMP algorithms

CLO 4: Implementing Bubble sort, Insertion sort, Quick sort, Merge sort, Heap sort, Radix sort and Binary tree sort

Live Project - III	
Course Code:21BCA471	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : 21BCA204, 21BCA254	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Show preparedness to work independently on real time problem scenarios to be addressed using knowledge of fundamentals, techniques, programming languages and tools in the area of Computer Science.

CLO 2: Use the innovative ideas and thoughts to address real life issues and provide efficient solutions for process oriented works.

CLO 3: Practice and develop skills in time management and reporting within an industrial or research laboratory setting.

CLO 5: To build the confidence in report writing.

CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams

ESSENTIALS OF BLOCKCHAIN & IOT –LEVEL-I	
Course Code: 21CS0201	
Credits: 1	
L T P : 0 0 2	
Pre-Requisite : NIL	

TRAINING LEARNING OUTCOME (TLO)

After the completion of training students will be able to:

CLO 1: Understand how bit coin and other coins work in real world.

CLO 2: Analyse the properties of Block Chain models.

CLO 3: Understand the vision of IoT and communication protocols from a global context.

CLO 4: Design portable IoT using appropriate boards.

SEMESTER - V

Unix & Linux Programming	
Course Code: 21BCA502	
Credits: 3	
L T P : 3 0 0	
Prerequisite: 21BCA303	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.

CLO 2: Ability to write Shell Programming using Linux commands.

CLO 3: Ability to design and write application to manipulate internal kernel level Linux File System.

CLO 4: Ability to develop IPC-API's that can be used to control various processes for synchronization.

CLO 5: Ability to develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

SOFT COMPUTING	
Course Code: 21BCA503	
Credits: 3	
L T P : 3 0 0	
Prerequisite: 21BCA205	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: List the facts and outline the different process carried out in fuzzy logic, ANN and Genetic Algorithms.

CLO 2: Understand the underlying principle of soft computing with its usage in various application.

CLO 3: Implement Neuro-Fuzzy and Neuro-Fuzz-GA expert system.

CLO 4: Develop application on different soft computing techniques like Fuzzy, GA and Neural network.

CLO 5: Design hybrid system to revise the principles of soft computing in various applications.

CLO 6: Evaluate various techniques of soft computing to defend the best working solutions.

SOFTWARE ENGINEERING	
Course Code: 21BCA504	
Credits : 3	
L T P: 3 0 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Analyze software development process models, including agile models and traditional models like waterfall.

CLO 2: Demonstrate the use of software life cycle through requirements gathering, choice of process model and design model

CLO 3: Apply and use various UML Models for software analysis and design.

CLO 4: Apply and use of various tools of testing.

Linux Programming Lab	
Code:21BCA552	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA502	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Ability to use various Linux commands that are used to manipulate system operations at admin level and a prerequisite to pursue job as a Network administrator.

CLO 2: Ability to write Shell Programming using Linux commands.

CLO 3: Ability to design and write application to manipulate internal kernel level Linux File System.

CLO 4: Ability to develop IPC-API's that can be used to control various processes for synchronization.

CLO 5: Ability to develop Network Programming that allows applications to make efficient use of resources available on different machines in a network.

SOFTWARE ENGINEERING LAB	
Code: 21BCA554	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA504	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Able to prepare SRS document, design document, test cases and software configuration management and risk management related document.

CLO 2: Develop function oriented and object oriented software design using tools like rational rose.

CLO 3: Able to perform unit testing and integration testing.

CLO 4: Apply various white box and black box testing techniques

CLO 5: Able to track the progress of a project using Open proj tool.

SEMINAR	
Code:21BCA506	
Credits: 1	
L T P : 0 0 2	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To simulate real life situations and engineering and impact adequate training, so that, confidence to face and tackle any problem in the field is developed

CLO 2: Analyze the selected topic, organize the content and communicate to audience in an effective manner.

INDUSTRIAL TRAINING	
Course Code: 21BCA556	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After

completion of course, students would be able to:

CLO 1: Improve their knowledge and skills relevant to their area of study.

CLO 2: Relate the knowledge and skills acquired at the workplace, to their on-campus studies

CLO 3: Compete effectively in the job market, because they have been equipped with the requisite knowledge, skills, attitudes and practical experience

CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams

CLO 5: To build the confidence to find the opportunity in the global market.

Live Project - IV	
Course Code:21BCA571	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : 21BCA204	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Show preparedness to work independently on real time problem scenarios to be addressed using knowledge of fundamentals, techniques, programming languages and tools in the area of Computer Science.

CLO 2: Use the innovative ideas and thoughts to address real life issues and provide efficient solutions for process oriented works.

CLO 3: Practice and develop skills in time management and reporting within an industrial or research laboratory setting.

CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams

CLO 5: To build the confidence in report writing.

PROFESSIONAL WRITING SKILLS & INTERPERSONAL SKILLS : STRATEGIES	
Course Code: 21SS554	
Credits : 1	
L T P: 0 0 2	
Pre-Requisite : NIL	

After the completion of the training, the student will have ability:

CLO 1: To understand the importance of professional writing required in workplace.

CLO 2: To explore different formats in resume, cover letters & other business related letters.

CLO 3: To develop knowledge, skills and understanding people in-group and individually.

CLO 4: To apply communication strategies either in-group or one on one basis and will be confident to lead the discussion among them.

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING-LEVEL-II	
Course Code: 21CS0202	

Credits: 1	
L T P : 0 0 2	
Pre-Requisite : NIL	

TRAINING LEARNING OUTCOME (TLO): -

CLO 1: Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem

CLO 2: Understands the basics and need of AI and Machine learning in global view.

CLO 3: Understands, apply and evaluate the supervised learning techniques.

CLO 4: Design and implement the different applications using the concepts of AI and ML

SEMESTER - VI

INTRODUCTION TO PYTHON PROGRAMMING	
Course Code: 21BCA601	
Credits : 4	
L T P: 4 0 0	
Pre-Requisite : 21BCA204	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To acquire programming skills in core Python.

CLO 2: To acquire Object Oriented Skills in Python

CLO 3: To develop the skill of designing Graphical user Interfaces in Python

CLO 4: To develop the ability to write database applications in Python

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	
Course Code:21BCA602	
Credits: 4	
L T P : 4 0 0	
Prerequisite: 21BCA503	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand basic concepts of Artificial intelligence, early developments in this field, basic knowledge representation and problem solving, and learning methods of Artificial Intelligence

CLO 2: Understand the applicability, strengths, and weaknesses of the basic knowledge representation, problem solving, and learning methods in solving particular problems, game playing as problem solving.

CLO 3: Representation of a game as a state space, state space search, heuristic search, blind and informed search.

CLO 4: Understand Natural language processing, expert system, modern developments in the field of AI, Soft Computing, Image processing, Robotics etc.

NETWORK SECURITY	
Course Code: 21BCA603	
Credits : 4	
L T P: 4 0 0	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand concept of network security and its applications.

CLO 2: Understand the theory of fundamental cryptography.

CLO 3: Improve their ability to apply encryption, decryption, symmetric and public key cryptographic algorithms.

CLO 4: Apply substitution and transposition techniques in DES and AES.

CLO 5: Demonstrate the various authentication applications

FUNDAMENTAL OF E-COMMERCE	
Course Code: 21BCA604	
Credits: 4	
L T P : 4 0 0	
Prerequisite: 21BCA404	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Consider ethical and legal issues related to e-commerce technologies such as manipulation of graphic and sound information, privacy and control of electronic media.

CLO 2: Create, modify, enhance and publish a simple e-commerce web site;

CLO 3: Design and prepare informative, organized, and accurate e-commerce related presentations of text, audio and graphical information taking into account technical and aesthetic considerations.

CLO 4: Analyze e-commerce business needs and resources and match to technology considering human factors and budget constraints.

CLO 5: To use critical thinking, problem-solving, and decision-making skills in evaluating e-commerce technologies

ARTIFICIAL INTELLIGENCE LAB	
Course Code:21BCA652	
Credits: 1	
L T P : 0 0 2	
Prerequisite: 21BCA602	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand and comprehend the basics of PROLOG programming and Make use of functions and its applications.

CLO 2: Explain the use of the built-in data structures list, sets, tuples and dictionary.

Major Project	
Course Code: 21BCA671	
Credits : 4	
L T P: 0 0 8	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: Show preparedness to work independently on real time problem scenarios to be addressed using knowledge of fundamentals, techniques, programming languages and tools in the area of Computer Science.
- CLO 2: Use the innovative ideas and thoughts to address real life issues and provide efficient solutions for process oriented works.
- CLO 3: Practice and develop skills in time management and reporting within an industrial or research laboratory setting.
- CLO 4: Contribute to an ethical and professional work culture and also to learn to work in diverse teams
- CLO 5: To build the confidence in report writing.

PROGRAM ELECTIVE - I

COMPUTER GRAPHICS	
Course Code: 21BCA305A	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.

CLO 2: Comprehend & analyze the fundamentals of animation, virtual reality, underlying technologies, and principles.

CLO 3: Design an application with the principles of virtual reality.

CLO 4: Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

CLO 5: Apply the viewing and projections operations in real life applications.

SYSTEM MODELLING AND SIMULATION	
Course Code: 21BCA305B	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.

CLO 2: Comprehend & analyze the fundamentals of animation, virtual reality, underlying technologies, and principles.

CLO 3: Design an application with the principles of virtual reality.

CLO 4: Implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.

CLO 5: Apply the viewing and projections operations in real life applications.

DIGITAL IMAGE PROCESSING	
Course Code: 21BCA305C	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Distinguish between lossy and lossless image compression model.

CLO 2: Understand and review image transforms.

CLO 3: Design & Synthesize Color image processing and its real world applications.

CLO 4: Analyze the basic algorithms used for image processing & image compression with morphological image processing.

CLO 5: Explain different Image enhancement techniques

OPTIMIZATION TECHNIQUES	
Course Code: 21BCA2027	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Identify and develop operational research models from the verbal description of the real system.

CLO 2: Solve the linear Programming by various methods.

CLO 3: Apply scheduling and networks techniques on related problems.

CLO 4: Well versed with different inventory models.

CLO 5: Solve queuing models.

Compiler Design	
Course Code: 21BCA305D	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand the major phases of compilation and to understand the knowledge of Lex tool & YACC tool.

CLO 2: Develop the parsers and experiment the knowledge of different parsers design without automated tools.

CLO 3: Construct the intermediate code representations and generation.

CLO 4: Convert source code for a novel language into machine code for a novel computer and Apply for various optimization techniques for dataflow analysis.

CLO 5: Construct the code generation for optimization.

Principles of Programming Languages	
Course Code: 21BCA305E	
Credits: 4	
L T P : 3 1 0	
Prerequisite: NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Describe distinguishing characteristics of declarative (functional & logical) and imperative (procedural & object-oriented) programming language paradigms and explain how these characteristics manifest in historic and contemporary programming languages.

CLO 2: Evaluate syntactic, semantic, and pragmatic trade-offs among the various programming paradigms and programming languages and Demonstrate different forms of declaration, typing, binding, visibility, scoping, and lifetime management for various programming language constructs (e.g. variables, functions, data structures including objects, etc.)

CLO 3: Describe the function of Language Processing Components (e.g. Scanner, Parser, etc.) and Use formal systems, including Formal Language Descriptions, Lambda Calculus, and Denotation Semantics, to explain and model various programming language concepts.

CLO 4: Summarize the history and continuing evolution of programming languages and explain the need to continuously learn new languages throughout your career.

PROGRAM ELECTIVE – II

DISTRIBUTED OPERATING SYSTEM	
Course Code: 21BCA505A	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

CLO 1: Outline the potential benefits of distributed systems, Summarize the major security issues associated with distributed systems

CLO 2: Apply standard design principles in the construction of these systems

CLO 3: Select appropriate approaches for building a range of distributed systems, including some that employ middleware

CLO 4: Communication skills (personal and academic).

CLO 5: Practical and subject specific skills (Transferable Skills).

CLO 6: Apply standard design principles in the construction of these systems

SYSTEM SOFTWARE	
Course Code: 21BCA505B	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To understand the relationship between system software and machine architecture.

CLO 2: To know the design and implementation of assemblers

CLO 3: To know the design and implementation of linkers and loaders.

CLO 4: To have an understanding of macro processors.

CLO 5: To have an understanding of system software tools.

CLO 6: To understand the relationship between system software and machine architecture.

SOFTWARE PROJECT MANAGEMENT	
Course Code: 21BCA505C	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand concept of stepwise project planning.

CLO 2: Apply basic concepts related to software project planning and evaluation.

CLO 3: Analyze various project risk planning and control.

CLO 4: Describe various project management activities such as tracking, project procurement, configuration management, monitoring.

CLO 5: Apply the concepts of organizational behavior and motivation in a team.

GRID COMPUTING	
Course Code: 21BCA505D	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

OBJECT ORIENTED ANALYSIS & DESIGN	
Course Code: 21BCA505E	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

CLO 1: Overview of requirements - Initial understanding of the domain

CLO 2: Business Model; Requirement's workflow; Osbert Ogles by case study-

CLO 3: MSG Foundation case study; revising the requirements; MSG Foundation case study

CLO 4: Continuing the requirements workflow Refining the– MSG Foundation case study revised requirements –MSG Foundation case study.

NEURAL NETWORKS & FUZZY LOGIC	
Course Code: 21BCA505F	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To Expose the students to the concepts of feed forward neural networks

CLO 2: To provide adequate knowledge about feedback networks.

CLO 3: To teach about the concept of fuzziness involved in various systems.

CLO 4: To provide adequate knowledge about fuzzy set theory

CLO 5: To provide comprehensive knowledge of fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.

CLO 6: To provide adequate knowledge of application of fuzzy logic control to real time systems.

CYBER SECURITY	
Course Code: 21BCA505G	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand concept of cyber security and cyber attacks.

CLO 2: Understand the theory of fundamental of intrusions and anomaly detection.

CLO 3: Improve their ability to apply Software as a service in cloud security.

CLO 4: Apply data linking and profiling in data privacy

CLO 5: Demonstrate the various network security model

THEORY OF COMPUTATION	
Course Code: 21BCA505H	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Understand concept of alphabets, string, language and its operations.

CLO 2: Understand the theory of DFA, NDFA and its conversion.

CLO 3: Improve their ability to understand regular languages and apply their relationship with finite automata.

CLO 4: Well-versed with parse trees, ambiguities in grammars and languages.

CLO 5: Apply the concepts of recursive and recursively enumerable languages and design efficient Turing Machines.

PROGRAM ELECTIVE – III

BIG DATA & ANALYTICS	
Course Code: 21BCA605A	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Explain the motivation for big data systems and identify the main sources of Big Data in the real world and driver analysis of big data.

CLO 2: Demonstrate an ability to use analytics efficiently store retrieve and process Big Data for inferential analysis that will help in solving real world problems.

CLO 3: Understand visual perception in a better way.

CLO 4: Apply several newer algorithms for Clustering Classifying and finding associations in Big Data using Knowledge discovery mechanism.

CLO 5: Design an ecosystem to monitor and maintain the large number of files using big data tools Apache Hadoop.

WIRELESS ADHOC AND SENSOR NETWORKS	
Course Code:21BCA605B	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge about ad hoc networks.

CLO 2: Demonstrate an ability to use layers of networking for extensive security.

CLO 3: Implement several functions using sensor nodes and their hardware and software requirements.

CLO 4: Apply concepts of MAC and other routing mechanism to ensure reliable communication.

CLO 5: Understanding implementation of Congestion control in networking system.

DATA WAREHOUSING AND DATA MINING	
Course Code: 21BCA605C	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: Data pre-processing and data quality.

CLO 2: Modeling and design of data warehouses.

CLO 3: Algorithms for data mining.

MOBILE COMPUTING	
Course Code:21BCA605D	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge about wireless computing using advanced technologies.

CLO 2: Demonstrate an ability to use LAN protocols, architecture and their application.

CLO 3: Implement several functions using routing services.

CLO 4: Apply concepts of distributed location and managing data delivery models.

CLO 5: Understanding implementation of client server mobile agents.

MACHINE LEARNING	
Course Code:21BCA605E	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE OBJECTIVE (CO)

- CLO 1: To impart the basic concepts about machine.
- CLO 2: To understand concepts about decision tree learning.
- CLO 3: To impart knowledge on Bayes theorem and learning algorithms.
- CLO 4: To illustrate knowledge on genetic algorithms using various techniques.
- CLO 5: To enable them to work on inductive and analytical learning.

OPEN SOURCE SOFTWARE	
Course Code:21BCA605F	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: To gather extensive knowledge about Linux and GNU Philosophy.
- CLO 2: Demonstrate an ability to handle environment using system administration.
- CLO 3: Implement several techniques of programming such as FOSS.
- CLO 4: Apply concepts of python programming for commercial software.
- CLO 5: Understanding implementation of real life situations.

ADVANCED JAVA PROGRAMMING	
Course Code:21BCA605G	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: To gather extensive knowledge about threading in java and networking.
- CLO 2: Demonstrate an ability to use beans and applets over web.
- CLO 3: Implement several functions such as RMI for advanced networking concepts.
- CLO 4: Apply concepts of JDBC and create web based applications.
- CLO 5: Understanding implementation of advanced Swing programming.

CLOUD COMPUTING	
Course Code:21BCA605H	
Credits : 4	
L T P: 3 1 0	
Pre-Requisite : NIL	

COURSE LEARNING OUTCOME (CLO)

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To gather extensive knowledge about different cloud types.

CLO 2: Demonstrate an ability to use different cloud applications.

CLO 3: Implement several functions such as Indian and International standard communication in cloud requirements.

CLO 4: Apply concepts of cloud to improve performance through balancing issues.

CLO 5: Understanding implementation how these services apply in cloud.

OPEN ELECTIVE - I

GERMAN LANGUAGE PHASE I	
Course Code: 21FLGR301	
Credits: 2	
L T P: 2 0 0	
Prerequisite: Nil	

COURSE LEARNING OUTCOME (CLO)

- CLO 1: After completion of this student will be able to read and write short, simple texts.
CLO 2: After completion of this student will have Fluency in reading and writing.
CLO 3: After completion of this student will be able understand a dialogue between two native speakers and to take part in short, simple conversations using the skills acquired.
CLO 4: student will able to know the culture of the countries where the German language is spoken.
CLO 5: Developing pronunciation so that they can read the text and e-mail during their employment, instructing them to write their own CV and developing a fundamental conversation with any German national.

FRENCH LANGUAGE PHASE I	
Course Code: 21FLFR301	
Credits: 2	
L T P : 2 0 0	
Prerequisite: Nil	

COURSE LEARNING OUTCOME (CLO)

- CLO 1: After completion of this student will be able to read and write short, simple texts.
CLO 2: After completion of this student will have Fluency in reading and writing.
CLO 3: After completion of this student will be able understand a dialogue between two native speakers and to take part in short, simple conversations using the skills acquired.
CLO 4: student will able to know the culture of the countries where the French language is spoken.

OPEN ELECTIVE - II

GERMAN LANGUAGE PHASE II	
Course Code: 21FLGR401	
Credits: 2	
L T P: 2 0 0	
Prerequisite: Nil	

COURSE LEARNING OUTCOME (CLO)

- CLO 1: After completion of this student will be able to read and write short, simple texts.
CLO 2: After completion of this student will have Fluency in reading and writing.
CLO 3: After completion of this student will able to use language creatively and spontaneously.
CLO 4: Students will get awareness of cross-cultural and intercultural difference.

FRENCH LANGUAGE PHASE II	
Course Code: 21FLFR401	
Credits: 2	
L T P : 2 0 0	
Prerequisite: Nil	

COURSE LEARNING OUTCOME (CLO)

CLO 1: After completion of this student will be able to read and write short, simple texts.

CLO 2: After completion of this student will have Fluency in reading and writing.

CLO 3: After completion of this student will able to use language creatively and spontaneously.

CLO 4: After completion of this student will able to know the culture of the countries where it is used.

OPEN ELECTIVE – III

ENTREPRENEURSHIP & NEW VENTURE MANAGEMENT	
Course Code: SEC-FT-01	
Credits: 3	
L T P : 3 0 0	
Pre-Requisite : NIL	

COURSE EDUCATIONAL OBJECTIVES AND OUTCOMES:

CLO 1: To learn about and get an insight of Entrepreneurs and Entrepreneurship development.

CLO 2: To understand the basic of Business project report, Fund raising and SWOT analysis.

CLO 3: Understand the different support system for business development.

CLO 4: Gain knowledge and acquire skill for setting up an enterprise and learn how the management works.

OPEN ELECTIVE – IV

Sustainable Growth & Development	
Course Code:21ESUG202	
Credits: 3	
L T P C : 3 0 0	
Prerequisite: Basics understanding of environment and natural ecosystems	

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

CLO 1: To develop awareness about our environment and elicit collective response for its protection.

CLO 2: Able to understand the different types of environmental pollution problems and their sustainable solutions.

CLO 3: Able to work in the area of sustainability for research and education.

CLO 4: Having a broader perspective in thinking for sustainable practices by utilizing the

engineering knowledge and principles gained from this course

Waste Management	
Course Code:21ESUG203	
Credits: 3	
L T P C : 3 0 0	
Prerequisite: Basics understanding of about waste	

COURSE LEARNING OUTCOMES

The syllabus has been prepared in accordance with National Education Policy (NEP). After completion of course, students would be able to:

- CLO 1: To develop an awareness about solid waste and management practices
- CLO 2: Able to design feasible solutions for waste management
- CLO 3: Students will have understanding of waste management practices, law and regulation related to solid waste management.