



**BACHELOR OF COMPUTER APPLICATION (ET0142CS)
B.C.A.**

**Program Outcomes
Program Specific Outcomes
Course Outcomes**

B.C.A.

PROGRAM OUTCOMES (POs)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively 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.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

COURSE OUTCOMES

BCA-101 - Computer Fundamentals

CO1: Be able to identify computer hardware and peripheral devices

CO2: Be familiar with software applications

CO3: Understand file management

CO4: Accomplish creating basic documents, worksheets, presentations with their properties.

CO5: Experience working with email and recognize email netiquette.

BCA-102 - C Language

- CO1: Understand the basic terminology used in computer programming
- CO2: Use different data types in a computer program.
- CO3: Design programs involving decision structures, loops and functions.
- CO4: Explain the difference between call by value and call by reference.
- CO5: Understand the dynamics of memory by the use of pointers.
- CO6: Use different data structures and create/update basic data files

BCA-103 - Mathematics

- CO1. Demonstrate competency in the areas that comprise the core of the mathematics major
- CO2. Demonstrate the ability to understand and write mathematical proofs
- CO3. Be able to use appropriate technologies to solve mathematical problems
- CO4. Be able to construct appropriate mathematical models to solve a variety of practical problems
- CO5. Obtain a full-time position in a related field or placement

BCA-104 - Basics of Internet Programming

- CO1: Analyze a web page and identify its elements and attributes.
- CO2: Create web pages using HTML and Cascading Styles sheets.
- CO3: Build dynamic web pages using JavaScript (client side programming).
- CO4: Create XML documents used in Web Publishing.
- CO5: Create XML Schema for data transfer in distributed environment.

BCA-105 - Communication Skills

- CO:1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.
- CO:2. Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations. Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation. This specific program is one of the leading presentation skills training courses developed to help people engage audiences.
- CO:3 A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One should learn to control the conversation through listening attentively and then having the perseverance to mould it towards his/her own direction.
- CO:4 Develop, exhibit and accurate sense of self and nurture a deep understanding of personal motivation. Develop an understanding of and practice personal and professional responsibility.
- CO:5 To practice and develop writing processes pertaining to invention, revision, organization, drafting through multiple drafts, editing, and adjusting for rhetorical context (purpose, audience, persona). To

discuss and share writing and reading with one another and develop a shared vocabulary for talking about writing.

BCA-106 Principles of Management

CO1. Assume the roles and responsibilities associated with managerial functions.

CO2. Identify the key contributors and their contributions in the development of management thought.

CO3. Compare various approaches in management for problem solving.

BCA-107 – Computer Fundamental & PC Computing Lab

CO1. Describe the usage of computers and why computers are essential components in business and society.

CO2. Utilize the Internet Web resources and evaluate on-line e-business system.

CO3. Solve common business problems using appropriate Information Technology applications and systems.

CO4. Identify categories of programs, system software and applications. Organize and work with files and folders.

CO5. Describe various types of networks network standards and communication software.

BCA-108 - C Language Lab

CO1. Write programs using advance concepts of C- language.

CO2. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

CO3. Design graphics programs using C.

BCA-109 - Internet Programming Lab

CO1. Design web pages.

CO2. Format and validate web pages.

CO3. Design web sites and deploy it on web servers.

BCA-201 - Digital Electronics

CO:1 Convert different type of codes and number systems which are used in digital transmission and computer systems.

CO:2 Apply the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

CO:3 Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

CO:4 Design different types of with and without memory element digital electronic circuits for particular operation, within the real time of economic, performance, efficiency, user friendly and environmental constraints.

CO:5 Assess the nomenclature and technology in the area of various memory devices used and apply the memory devices in different types of digital circuits for real world application.

BCA-202- Computer Organization & Architecture

CO1: Understand the major components of a computer including CPU, memory, I/O and storage.

CO2: Students will understand the uses for cache memory.

CO3: Understand a wide variety of memory technologies both internal and external.

CO4: Understand the role of the operating system in interfacing with the computer hardware. CO5: Students will understand the basic components of the CPU including the ALU and control unit.

BCA-203- System Analysis & Design

CO1: Understand the major components of a computer including CPU, memory, I/O and storage.

CO2: Students will understand the uses for cache memory.

CO3: Understand a wide variety of memory technologies both internal and external.

CO4: Understand the role of the operating system in interfacing with the computer hardware. CO5: Students will understand the basic components of the CPU including the ALU and control unit.

BCA-204 - Data Structure & Algorithms

CO1: Able to walk through insert and delete for different data structures.

CO2: Ability to calculate and measure efficiency of code

CO3: Appreciate some interesting algorithms like Huffman, Quick Sort, and Shortest Path etc.

CO4: Able to walkthrough algorithm.

CO5: Improve programming skills.

BCA-205- Linux Environment

CO1: Will be able to describe and use the LINUX operating system.

CO2: Will be able to describe and use the fundamental LINUX system tools and utilities.

CO3: We will be able to describe and write shell scripts in order to perform basic shell programming.

CO4: Will be able to describe and understand the LINUX file system.

BCA-206 - Environment Studies

CO1: Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. Ecosystem Links between environmental components and their role.

CO2: Basic Structure of atmosphere and their functions Current problems related issues Students will apply knowledge of the sciences within an interdisciplinary context in solving environmental issues such as environmental health, food and agriculture, energy, waste and pollution, climate change, management, and loss of biodiversity.

CO3: Basic knowledge about water resources, current problems related issues, water born diseases, technologies of water treatment.

CO4: Level of sound and their units, sources and effects of noise pollution, control measures.

CO5: Concept of non Conventional energy resources, types and various applications of renewable resources and current potentials of energy resources.

BCA-207- Data Structures& Algorithms Lab

CO:1. Be able to design and analyze the time and space efficiency of the data structure

CO:2. Be capable to identify the appropriate data structure for given problem

CO:3. Have practical knowledge on the applications of data structures

BCA-208 - Linux Environment Lab

CO1. Learn UNIX structure, commands, and utilities.

CO2. Describe and understand the UNIX file system.

CO3. Write shell scripts in order to perform shell programming.

CO4. Acquire knowledge about text processing utilities, process management and system operation of UNIX.

BCA-209 - Personality Development Lab

CO1. Comprehend conversations and speeches.

CO2. Speak with clarity and confidence, thereby enhancing their employability skills.

CO3. Identify his/her creative self, and express effectively the same in writing.

CO4. Explain the advantages of teamwork and how the tasks could be completed effectively when done as a cohesive unit.

CO5. Realize that selecting goal is a fundamental component to long-term success of an individual.

CO6. Enable students to understand different aspects of leadership and evaluate in their own strengths.

CO7. Be more organized and disciplined.

BCA-301 - Object Oriented Programming using C++

CO1: Understand object-oriented programming features in C++.

CO2: Apply these features to program design and implementation.

CO3: Understand object-oriented concepts and how they are supported by C++.

CO4: Gain some practical experience of C++.

CO5: Apply the facilities offered by C++ for Object-Oriented Programming.

BCA-302 - Database Management System

CO1: Understand, appreciate and effectively explain the underlying concepts of database Technologies.

CO2: Design and implement a database schema for a given problem-domain

CO3: Normalize a database and Populate and query a database using SQL DML/DDDL commands.

CO4: Declare and enforce integrity constraints on a database

CO5: Concept of transaction and concurrency.

BCA-303 - Front End Design Tool (VB)

CO1: Design, create, build, and debug Visual Basic applications.

CO2: Explore Visual Basic's Integrated Development Environment (IDE).

CO3: Implement syntax rules in Visual Basic programs also Explain variables and data types used in program development.

CO4: Apply arithmetic operations for displaying numeric output.

CO5: Write and apply decision structures for determining different operations, loop structures to perform repetitive tasks.

CO6 : Write and apply procedures, sub-procedures, and functions to create manageable code.

BCA-304 - Managerial Personality Development

CO:1. Develop and maintain a Reflection.

CO:2. Develop and articulate a personal philosophy of meeting & greeting.

CO:3. Grasp the exact mean of management in so many ways like time, wardrobe & stress.

CO:4. Learn about- how to represent, effective skills & body language.

CO:5. Grasp the practical knowledge in the form of GD and interview.

BCA-305 - Technical Communication

CO:1. Demonstrate that you can effectively communicate technical material in print.

CO:2. Demonstrate that you can present technical material orally with confidence and poise.

CO:3. Demonstrate that you can present technical material using audiovisual materials.

CO:4. Demonstrate that you can communicate technical material to a variety of audiences, from members of the building and engineering trades and medical fields to government representatives and the general public.

CO:5. Demonstrate that you can work well in teams

BCA-306 - Discrete Mathematics

CO1. Be able to reason at multiple levels of detail and abstraction, being aware, in particular, of the applicability and limitations of tools from mathematics and theoretical computer science

CO2. Recognize the context in which a computer system may function, including its interactions with people and the physical world.

CO3. Able to communicate with, and learn from, experts from different domains throughout their careers

CO4. Possess a solid foundation that allows and encourages them to maintain relevant skills as the field evolves

CO5. To be able to manage their own career development and advancement

CO6. Manage their own learning and development, including managing time, priorities, and progress

- CO7. Have developed interpersonal communication skills as part of their project experience
- CO8. Work effectively both individually and as members of teams
- CO9. Make effective presentations to a wide range of audiences about technical problems and their solutions
- CO10. Encompass an appreciation of the interplay between theory and practice.

BCA-307 - OOPS Lab Using C++

- CO1. Understand key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism.
- CO2. Design and implement object-oriented applications.
- CO3. Analyze problems and implement simple C++ applications using an object-oriented software engineering approach.

BCA-308 - DBMS LAB

- CO1. Demonstrate an understanding of the relational data model.
- CO2. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.
- CO3. Formulate, using relational algebra, solutions to a broad range of query problems.
- CO4. Formulate, using SQL, solutions to a broad range of query and data update problems.

BCA-309 - Front End Design Tool (VB) Lab

- CO1: Design, create, build, and debug Visual Basic applications.
- CO2: Apply arithmetic operations for displaying numeric output.
- CO3: Apply decision structures for determining different operations.
- CO4: Write and apply loop structures to perform repetitive tasks.
- CO5: Write and apply procedures, sub-procedures, and functions to create manageable code.
- CO6: Create one and two dimensional arrays for sorting, calculating, and displaying of data.
- CO7: Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.
- CO8: Write Windows applications using forms, controls, and events.

BCA-401 - Operating Systems

- CO1: Understand the basic working process of an operating system.
- CO2: Understand the importance of process and scheduling.
- CO3: Understand the issues in synchronization and memory management.

BCA-402 - Computer oriented Numerical & Statistical Methods using C

- CO1. Apply numerical methods to find our solution of algebraic equations using different methods under different conditions, and numerical solution of system of algebraic equations.

- CO2. Apply various interpolation methods and finite difference concepts.
- CO3. Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.
- CO4. Work numerically on the ordinary differential equations using different methods through the theory of finite differences.
- CO5. Work numerically on the partial differential equations using different methods through the theory of finite differences.

BCA-403 - Java Programming

- CO1: The students will have the competence in the use of Java Programming language.
- CO2: The development of small to medium sized application programs that demonstrate professionally acceptable coding.
- CO3: The students will have the competence in the use of Java Programming language.
- CO4: An understanding of the principles and practice of object oriented programming in the construction of robust maintainable programs which satisfy the requirements.
- CO5: Design and implement an application that demonstrates their competency with Java syntax, structure and programming logic, incorporating basic features of the language as well as some features from the I/O (Input/Output) or GUI libraries.
- CO6: Competence in the use of Java Programming language in the development of small to medium sized application programs that demonstrate professionally acceptable coding and performance standards.

BCA-404 - Software Engineering

- CO1: Understand the importance of the stages in the software life cycle.
- CO2: Understand the various process models.
- CO3: Be able to design software by applying the software engineering principles.

BCA-405 - Data Mining & Data Warehousing

- CO1: Have a deeper understanding of database systems and their underlying theory to be able to improve the decision-making process.
- CO2: Understand the technology of data warehousing.
- CO3: Understand data mining concepts and techniques.

BCA-406 - Communication Skills- Scientific & Technical Writing

- CO1. Understand how to apply technical information and knowledge in practical documents for a variety of a.) Professional audiences (including peers and colleagues or management) and b) public audiences.
- CO2. Recognize, explain, and use the rhetorical strategies and the formal elements of these specific genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, web pages, wikis, and correspondence.
- CO3. Participate actively in writing activities (individually and in collaboration) that model effective scientific and technical communication in the workplace.

CO4. Recognize, explain, and use the rhetorical strategies and the formal elements of these specific genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, web pages, wikis, and correspondence. Revise and edit effectively in all assignments, including informal media (such as email to the instructor).

CO5. Collect, analyze, document, and report research clearly, concisely, logically, and ethically; understand the standards for legitimate interpretations of research data within scientific and technical communities.

BCA-407 - Java Lab

CO1. Student should know the model of object oriented programming and fundamental features of an object oriented language.

CO2. Student should know how to test, document and prepare a professional looking package for each business project.

CO3. Student have the ability to write a computer program to solve specified problems and to use the Java SDK environment to create, debug and run simple Java programs.

CO4. Student will be able to explain and develop programs for inheritance, multithreading, applets, exception handling and file handling.

BCA-408 - S.E. Lab

CO1. Create models for software applications.

CO2. Use the different UML notations for designing software.

BCA-409 - C.T Lab/ Seminar

CO1. Improvement in proficiency in English

CO2. Improvement in presentation skill

CO3. Improvement in analytical and reasoning ability

CO4. Improvement in technical writing

BCA-501 - Computer Network

CO1: Explain the importance of data communications and the Internet in supporting business Communications and daily activities.

CO2: Explain how communication works in data networks and the Internet.

CO3: Recognize the different internetworking devices and their functions.

CO4: Explain the role of protocols in networking.

CO5: Analyze the services and features of the various layers of data networks.

BCA-502 - System Software

CO1: Understand SIC architecture, features of utility software's such as assemblers, loaders, linkers, editors and macro processor.

CO2: Design simple assembler for Simple instruction computer.

CO3: Design linker and loaders for simple instruction computer.

CO4: Design elementary macro processor for simple assembly level language.

CO5: Design and implement simple lexer and parser using lex and yacc tools.

BCA-503 - Advance Internet Programming

CO1: Analyze a web page and identify its elements and attributes.

CO2: Design, Format and validate web pages in ASP.

CO3: Build dynamic web pages using ASP.

CO4: Create Database using ADO.

CO5: Create XML documents used in Web Publishing.

CO6: Design web sites and deploy it on web servers.

BCA-504 - Advance Java

CO1 Develop Swing-based GUI.

CO2: Develop client/server applications and TCP/IP socket programming

CO3: Update and retrieve the data from the databases using SQL

CO4: Develop component-based Java software using JavaBeans.

CO5: Develop server side programs in the form of servlets.

BCA-505 - Computer Graphics

CO1: Students will demonstrate an understanding of contemporary graphics hardware.

CO2: Students will create interactive graphics applications in C++ using one or more graphics.

CO3: Students will create interactive graphics applications in C++ using one or more graphics application programming interfaces.

CO4: Students will write program functions to implement graphics primitives.

CO5: Students will write programs that demonstrate geometrical transformations.

BCA-506 - E-Commerce

CO1: Have knowledge of e-commerce, its components, structure of e-banking, rules and regulations on e-commerce.

CO2: Acquire a good knowledge of e-commerce, both the technical and business aspects;

CO3: Understand the principles and practices of e-commerce and its related technologies;

CO4: Discuss the trends in e-Commerce and the use of the Internet.

CO5: Explain the economic consequences of e-Commerce.

BCA-507 - Computer Advance Internet Programming Lab

CO1: Design and deploy web application using servlets.

CO2:Design and deploy web application using JSPs.

CO3:Design and deploy web application using Ajax.

BCA-508 - Advance Java Lab

CO1.learn the Internet Programming, using Java Applets

CO2.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) & Swings

CO3.Apply event handling on AWT and Swing components.

CO4.Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).

CO5.Create dynamic web pages, using Servlets and JSP.

CO6.Make a reusable software component, using Java Bean.

CO7.Invoke the remote methods in an application using Remote Method Invocation (RMI) CO8.understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).

BCA-601 - Advance Computer Network

CO1:Illustrate reference models with layers, protocols and interfaces. & Summarize functionalities of different Layers.

CO2:Combine and distinguish functionalities of different Layers

CO3:Describe and Analysis of basic protocols of computer networks, and how they can be used to assist in network design and implementation

CO4:Identify and describe development history of routing protocols

CO5:Describe Sub-netting and Addressing of IP V4.LT

BCA-602 - Management Information System

CO1:Students would be able to understand the usage of MIS in organizations and the constituents of the MIS.

CO2:The student would understand the classifications of MIS, understanding of functional MIS and the different functionalities of these MIS. This would be followed by case study on Knowledge management.

CO3:This module lead to linking MIS to business strategy and the areas in which MIS would lead to strategic advantage. This would be followed by case study and guest lecture.

CO4:The student learns the functions and issues at each stage of system development. Further different ways in which systems can be developed are also learnt.

CO5: This module provides understanding about emerging MIS technologies like ERP, CRM, SCM and trends in enterprise applications.

BCA-603 - Artificial Intelligence

CO1:Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.

CO2: Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.

- CO3: Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systems for Game Playing
- CO4: Attain the capability to represent various real life problem domains using logic based techniques and use this to perform inference or planning.
- CO5: Formulate and solve problems with uncertain information using Bayesian approaches.
- CO6: Apply concept Natural Language processing to problems leading to understanding of cognitive computing.

BCA-604A - .Net Programming

- CO1: Contrast and compare major elements of the .NET Framework and explain how C# fits into the .NET platform.
- CO2: Analyze the basic structure of a C# application and be able to document, debug, compile, and run a simple application.
- CO3: Create methods (functions and subroutines) that can return values and take parameters.
- CO4: Demonstrate use of common objects and reference types.
- CO5: Demonstrate ability to create a C# Windows and web application using Visual Studio.

BCA-604B - Fundamental of PHP

- CO1: Understand process of executing a PHP-based script on a webserver.
- CO2: Be able to develop a form containing several fields and be able to process the data provided on the form by a user in a PHP-based script.
- CO3: Understand basic PHP syntax for variable use, and standard language constructs, such as conditionals and loops.
- CO4: Understand the syntax and use of PHP object-oriented classes.
- CO5: Understand the syntax and functions available to deal with file processing for files on the server as well as processing web URLs.
- CO6: Understand the paradigm for dealing with form-based data, both from the syntax of HTML forms, and how they are accessed inside a PHP-based script.

BCA-604C - Principles of Accounting

- CO1. Demonstrate the role of accounting in business in economic world.
- CO2 Explain the principles of accounting and book keeping
- CO3 Apply accounting rules in determining financial results and preparation of financial statement.
- CO4 Rectify errors caused during preparation of Final accounts.
- CO5 Use software in preparation of Financial Statements.

BCA-604D - Intellectual Property Rights

- CO1. The students once they complete their academic projects, shall get an adequate knowledge on patent and copyright for their innovative research works

CO2. During their research career, information in patent documents provide useful insight on novelty of their idea from state-of-the art search. This provide further way for developing their idea or innovations

CO3. Pave the way for the students to catch up Intellectual Property(IP) as an career option R&D IP Counsel, Government Jobs –Patent Examiner, Private Jobs, Patent agent and Trademark agent, Entrepreneur

BCA-605A - Social Implications of IT

CO1: Understand the consequences of ignoring and non-compliance with ethical imperatives.

CO2: Learn about the best ethical practices and models.

CO3: Develop a sound methodology in resolving ethical conflicts and crisis.

CO4: Learn about the issues directly related to information technology environment and professionals.

BCA-605B - Mobile Computing

CO1 Have the understanding of different generations, terminologies, systems, operations and design of wireless and mobile communications.

CO2: Acquire sufficient knowledge about IEEE 802.11 and Bluetooth standards.

CO3: Be able appreciate the contribution of Mobile and Wireless Communication networks to overall technological growth

CO4: Understand the concepts and technology involved in 3G, 4G and 5G Networks

BCA-605C - Cyber Ethics & Crime

CO1: Understand the consequences of ignoring and non-compliance with ethical imperatives.

CO2: Learn about the best ethical practices and models.

CO3: Develop a sound methodology in resolving ethical conflicts and crisis.

CO4: Learn about the issues directly related to information technology environment and professionals.

BCA-605D – Entrepreneurship

CO1. Examine the characteristics of an entrepreneur as well their role in the economic development of the country.

CO2. Process & develop business plan , foreseeing the entry barriers to the industry

CO3 Identify stages of growth in entrepreneurial ventures along with changing face of family business in India

BCA-606 - .Net Lab/ PHP Lab

CO1 Design console application and windows application.

CO2 Design web application.