

# **BCA-I**

**Program Outcome (PO): BCA-I** This Program will educate the students to analyze, design and develop applications using information technology. After completion of this program students will be able to choose many different roles such as an IT and IS Consultants, Project planners, managers.

## **Program Specific Outcome (PSO)-I**

After Completing the first semester students will have the basic knowledge of computer fundamentals and basic programming skills.

### **Course Outcome (CO1): BCA 1.1 Fundamentals of IT & S/W Lab-I**

- To understand the basic concepts, terminology of IT and familiar with the use of IT tools.
- To Learn and explore new IT techniques in various applications and to identify the issues related to security.
- To learn the working knowledge of hardware and software of computer.
- To learn the various features of MS-Office.

### **CO2: BCA 1.2 Computer Programming & S/W Lab-II**

The course is designed to provide complete knowledge of C language. Students will be able to develop logics which will help them to create programs, applications in C. Also by learning the basic programming constructs they can easily switch over to any other language in future.

- Understand the basic terminology used in computer programming, Writing, Compiling and Debugging involving decision structures, loops and functions, arrays, strings and pointers.
- A student will be able to take up Systems programming or Advanced C programming course.

## **Program Specific Outcome (PSO) II**

After Completing the second semester students will have the basic knowledge of digital circuits and Data structures concepts.

### **CO1: BCA 2.1 Digital Electronics**

- Perform conversions among different number systems, become familiar with basic logic gates and understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties & design of combinational circuits such as MUX, DEMUX, Encoder and Decoder etc.
- Understand the design of sequential Circuits such as Flip-Flops, Registers, and Counters.
- Obtain a basic level of Digital Electronics knowledge and set the stage to perform the analysis and design of Complex Digital electronic Circuits.

**CO2: BCA 2.2 Data Structures & S/W Lab-III**

- To access how the choices of data structure & algorithm methods impact the performance of program.
- To solve problems based upon different data structure & also write programs.
- Know about the basic concepts of Function, Array and Link-list.
- Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees and various Sorting algorithms.
- Design new algorithms or modify existing ones for new applications and able to analyze the space & time efficiency of most algorithms.

## **BCA -II**

### **Programme Outcome (PO): BCA II (Bachelors in Computer Applications)**

This Program will enlighten students to analyse information systems, learn and enhance programming skills using information technology. After graduation, students will be able to choose many different roles to become IT and IS Consultants, Database developers, managers, interface designers and web developer.

### **Programme Specific Outcome (PSO)-I**

After completing the 3<sup>rd</sup> semester of this programme students will have the knowledge of object oriented concepts, Database development skills and thorough knowledge of Networking.

### **Course Outcome (CO) 1:OOP Using C++ and Software Lab IV**

Students will be able to:

1. Understand the difference between object oriented programming and procedural oriented language and data types in C++.
2. Program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
3. Simulate the problem in the subjects like Operating system, Computer networks and real world problems.
4. Implement various concepts related to language.

### **CO 2:Relational Database Management System and Software Lab V**

Students will be able to:

1. Gain a good understanding of the architecture and functioning of database management systems as well as associated tools and techniques, principles of data modelling using entity relationship and develop a good database design and normalization techniques to normalize a database.
2. Understand the use of structured query language and its syntax, transactions, database recovery and techniques for query optimization.
3. Acquire a good understanding of database systems concepts and to be in a position to use and design databases for different applications.

### **CO 3:Computer System Architecture**

Students will be able to:

1. Design basic computer architecture and define micro-operations.
2. Understand the CPU functioning and computer arithmetic.
3. Describe various methods and techniques of memory organization.
4. Demonstrate and perform computer arithmetic operations on integer and real numbers.
5. Categorize memory organization and explain the function of each element of a memory hierarchy.
6. Identify and compare different methods for computer I/O mechanisms.

### **Programme Specific Outcome (PSO)-II**

After completing the 4<sup>th</sup> semester of these programme students will have the knowledge of Python, the leading software development language, Operating system in general and specific and thorough knowledge of Networking.

### **CO 1: Python Programming and Software Lab VI**

Students will be able to:

1. Describe the Numbers, Math functions, Strings, List, Tuples and Dictionaries in Python
2. Express different Decision Making statements and Functions.
3. Interpret Object oriented programming in Python.
4. Understand and summarize different File handling operations.
5. Explain how to design GUI Applications in Python and evaluate different database operations.
6. Design and develop Client Server network applications using Python

### **CO 2: Operating System and Lab VII**

Students will be able to:

1. Describe different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
2. Develop deadlock handling algorithms and learn Memory management.
3. Implement various algorithms required for management, scheduling, allocation and communication used in operating system.
4. Describe and analyze the memory management and its allocation policies.
5. Identify use and evaluate the storage management policies with respect to different storage management technologies.
6. Identify the need to create the special purpose operating system.

### **CO 3: Computer Networking**

Students will be able to

1. Describe how communication works in computer networks and to understand the basic terminology of computer networks
2. Analyse the role of protocols in networking and features of the various layers in the protocol stack.
3. Design and understand issues in Network Security, various security threats, security services and mechanisms to counter them.

## **BCA -III**

### **Programme Outcome (PO): BCA III (Bachelors in Computer Applications)**

This Program will educate students to analyze, design, integrate and manage information systems using information technology. Students graduating from our Program will be able to choose many different roles becoming IT and IS Consultants, Project planners, managers, interface designers and web developer.

### **Programme Specific Outcome (PSO)-I**

After completing the 5<sup>th</sup> semester of this programme students will have the knowledge of object oriented concepts, Web Designing, various system softwares and applications of information system.

### **Course Outcome (CO) 1: Java Programming and Software Lab VII**

Students will be able to:

1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
4. Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.

### **CO 2: Web Technology –I and Software Lab VIII**

Students will be able to:

1. Demonstrates the basics of HTML (Images, Layouts, Tables, Forms), Style sheets and Javascript.
2. Implement interactive Web pages using HTML, CSS and Javascript.
3. Use WordPress and Photoshop tools.

### **CO 3: System Software**

Students will be able to:

1. Define types and features of system software.
2. Describe the importance of Language Processors (Assembler, Linker, Loader, Compiler).

3. Demonstrate understanding and use of Compilation Process and describe the basics of Interpreter, Text Editors and Debuggers.

#### **CO 4: Management Information System**

Students will be able to:

1. Describe the importance of management.
2. Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
3. Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
4. Effectively communicate strategic alternatives to facilitate decision making.
5. Demonstrate the Applications of Information System in Functional Areas (Marketing and Financial).

#### **Programme Specific Outcome (PSO)-II**

After completing the 6<sup>th</sup> semester of this programme students will have the knowledge of Server side web development, Data mining concepts, E-commerce technology. Students will be able to use the services of cloud and they can develop web and desktop applications.

#### **CO 1: Web Technology-II and Software Lab IX**

Students will be able to:

1. Understand how server-side programming works on the web.
2. Use PHP built in functions and creating custom functions.
3. Develop simple web application using server side PHP Programming and Database connectivity using MySQL.

#### **CO 2: E-Technologies**

Students will be able to:

1. Define and differentiate various types of Ecommerce Models.
2. Describe Hardware and Software Technologies for Ecommerce.
3. Explain payment systems for E - commerce.
4. Describe the process of Selling and Marketing on web.

5. Demonstrate an understanding of the importance of data mining and the principles of business intelligence.
6. Organize and prepare the data needed for data mining using pre pre-processing techniques.

### **CO 3: Minor Project**

Students will be able to

1. Identify the requirements for the real world problems and to understand the programming language concepts and basics of Software Development Life Cycle model for the implementation of the project.
2. Conduct a survey of several available literatures in the preferred field of study.
3. Study and enhance software/ hardware skills.
4. Demonstrate and build the project successfully by hardware requirements, coding and testing.
5. To plan, analyze, design and implement a software project using SDLC model.
6. To report and present the findings of the study conducted in the preferred domain.
7. Demonstrate an ability to work in teams.

### **CO 4: Software Engineering**

Students will be able to:

1. Define various software application domains and remember different process model used in software development.
2. Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.
3. Convert the requirements model into the design model and demonstrate use of software and user interface design principles.
5. Justify role of SDLC in Software Project Development and they can evaluate importance of Software Testing and Maintenance.

### **CO 5: Cloud Computing**

Students will be able to:

1. Define Cloud Computing and memorize the different Cloud service and deployment models.
2. Identify the need and applications of cloud computing.
3. Describe importance of virtualization along with their technologies.
4. Use and Examine different cloud computing services.

# **DCHN**

## **Program Outcome (PO): DCHN**

This Program will educate students to analyse, design, and integrate using information technology. Students post-graduating from our Program will be able to choose many different roles becoming IT and IS Consultants, Project planners, managers.

## **Program Specific Outcome (PSO) I**

After Completing the first semester students will have the basic knowledge of computer fundamentals, Computer Hardware and concepts related to Computer Networking & Server.

## **Course Outcome (CO) 1: DCHN 1.1 Fundamentals of Information Technology and MS-Office**

- To understand the basic concepts, terminology of IT and familiar with the use of IT tools.
- To familiarize the students with the network devices and the internet.
- To learn the various features of MS-Office.
- Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.

## **CO 2: DCHN 1.2 PC Assembly and Troubleshooting**

- Describe the characteristics of PC hardware components and explain their functionalities
- Describe the various types of motherboard architectures
- Use skills in assembling various types of system unit
- Describe the internal structure of disk drives and how they operate
- Use skills in identifying problems in assembling

## **CO: DCHN 1.3 Software Lab -1(DCHN 1.1 and DCHN 1.2)**

- To learn the working knowledge of hardware and software of computer.
- To learn the various features of MS-Office.
- To familiarize the students with the network devices and the internet.



## **Program Specific Outcome (PSO)-II**

After Completing the second semester students will have network essential and server administration.

### **CO 1: DCHN 2.1 Network Essentials**

- To explain how communication works in computer networks and to understand the basic terminology of computer networks
- To explain the role of protocols in networking and to analyse the services and features of the various layers in the protocol stack.
- To understand design issues in Network Security and to understand security threats, security services and mechanisms to counter them.

### **CO 2: DCHN 2.2 Server Administration**

- The aim of this programme is to teach the principles, theory and practice of system management, including network and system design, analysis, efficiency and security.
- The programme places emphasis on practical skills based on UNIX, Windows and Macintosh platforms but teaches general principles along with their technical and ethical foundations.
- At the end of the course students will be able to simulate the problem in the subjects like Operating system, Computer networks.

### **CO 3: DCHN 2.3 Software Lab -2(Based on DCHN 2.1&DCHN 2.2)**

Students will be able to:

- Understand how to install, upgrade and migrating to windows.
- Understand how to install active directory and manage active directory components.
- Learn how to configure DHCP server, manage and troubleshoot DHCP Server (windows).

# PGDCA

**Program Outcome (PO): PGDCA** This Program equips the Students with skills required for designing and developing applications in IT. After Completion of this Program Students will be able to learn the latest trends in various subjects of Computer Application and Information Technology.

## **Program Specific Outcome (PSO) I**

After Completing the first semester students will have the basic knowledge of computer fundamentals and basic programming skills.

### **Course Outcome (CO): PGDCA 1.1 Fundamentals of Information Technology**

- To understand the basic concepts, terminology of IT and familiar with the use of IT tools.
- To learn the various features of MS-Office.
- To familiarize the students with the network devices and the internet.

### **CO: PGDCA 1.2 Operating System**

- To make students able to learn different types of operating systems along with Concept of file systems and CPU scheduling algorithms used in operating system.
- To provide students' knowledge of memory management and deadlock handling algorithms.
- To make the students familiar with architecture of UNIX and windows operating system along with internal representation of files.

### **CO: PGDCA 1.3 Programming Fundamentals through 'C' Language**

- Understand the basic terminology used in computer programming.
- Writing, Compiling and Debugging involving decision structures, loops and functions, arrays, strings and pointers.

### **CO: PGDCA 1.4 Computer Organisations and Architecture**

- Study basic computer organization, design and micro-operations.
- Understanding of CPU functioning and computer arithmetic.
- Learning various methods and techniques of memory organization

### **CO: PGDCA 1.5 Software Lab-I Office Automation and Productivity Tools**

- To learn the working knowledge of hardware and software of computer.
- To learn the various features of MS-Office.
- To familiarize the students with the network devices and the internet.

### **CO: PGDCA 1.6 Software Lab-II Programming Fundamentals through 'C' Language**

- Writing, Compiling and Debugging involving decision structures, loops and functions, arrays, strings and pointers.
- To learn the concept of structure and union.

### **Program Specific Outcome (PSO) II**

After Completing the second semester students will have the basic knowledge of Data Structures concepts, Object Oriented Programming principles, Fundamentals of Database Management System and Computer Networks.

#### **CO: PGDCA 2.1 Data Structures**

- To access how the choices of data structure & algorithm methods impact the performance of program.
- To solve problems based upon different data structure & also write programs.
- Choose an appropriate data structure for a particular problem.

#### **CO: PGDCA 2.2 Object Oriented Programming using C++**

- Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.
- Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.
- At the end of the course students will able to simulate the problem in the subjects like Operating system, Computer networks and real world problems.

#### **CO: PGDCA 2.3 Database Management System with MS ACCESS**

- Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.
- To learn the use of database such as Microsoft access.
- Design different views of tables for different users and to apply embedded and nested queries.

#### **CO: PGDCA 2.4 Fundamentals of Computer Networks, Internet and Scripting Languages**

- To explain how communication works in computer networks and to understand the basic terminology of computer networks
- To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack.
- To understand design issues in Network Security and to understand security threats, security services and mechanisms to counter them.

#### **CO: PGDCA 2.5 Software Lab-III Data Structures and Programming with C++**

- Know about the basic concepts of Function, Array and Link-list.

- Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees and various Sorting algorithms.
- Design new algorithms or modify existing ones for new applications and able to analyze the space & time efficiency of most algorithms.

**CO: PGDCA 2.6 Software Lab IV MS ACCESS and Scripting Languages**

- To learn the use of database such as Microsoft access.
- To learn the use of Scripting Languages such as HTML, DHTML and Java Script.

## **M.Sc. IT (Master of Science in Information and Technology)**

### **Program Outcome (PO): M.Sc. IT (Master of Science in Information and Technology)**

This course focuses on practical experience as student can opt for career in the computer programming /software development/web development .The course grooms the students for lucrative avenues in IT industry as Web Designer, web administrator, software consultant, system analyst, Database administrator etc.

### **Program Specific Outcome (PSO)-I**

After studying 1<sup>st</sup> Semester, students will be able to understand the basic concepts of programming language along with the basic knowledge of discrete structure. In addition to that students have the complete knowledge of architecture of computer system along with software and students will have complete knowledge of research methodology that will help them in betterment of their future.

### **1. Course Outcome(CO)-I- Programming Using C**

The student after completing the course will be able to

- understand the basic terminology used in computer programming, compiling and debugging.
- read, understand and trace the execution of programs written in C language.
- write and execute the C- code for a given algorithm.

### **2. CO-II- Discrete Structure**

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

- Perform operations on various discrete structures such as set, function and relation.
- Apply basic concepts of asymptotic notation in analysis of algorithm.
- Comprehend formal logical arguments and translate statements from a natural language into its symbolic structures in logic.
- Get familiar with the techniques for constructing mathematical proofs and basics of counting.
- Identify and prove various properties of different algebraic structures such as group, rings and fields.

### **3. CO-III- Computer Organization & Architecture**

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

- Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.
- Analyze the performance of commercially available computers.
- To develop logic for assembly language programming.

#### **4. CO-IV- System Software**

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

- Cite knowledge of various approaches to document a software system (Remembering).
- Describe functional and non-functional requirements (Understanding).
- Use proper architecture for software (Applying).
- Categorize different components used in the software system (Analyzing).
- Evaluating the performance of compiler and assemblers styles.
- Evaluate the performance of text editors, debuggers and word processors.
- Improve quality of software by selecting proper architecture (Creating).

#### **5. CO-V-Software Lab I(Programming using C)**

The student after completing the course will be able to

- understand the basic terminology used in computer programming, compiling and debugging.
- read, understand and trace the execution of programs written in C language.
- write and execute the C- code for a given algorithm.

#### **6. CO-VI-Workshop-I (Reasoning and Research Aptitude)**

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

- Solve the reasoning paper in different competitive exams.
- Solve the queries related to the issues of research aptitude.

### **Program Specific Outcome(PSO)-II**

After studying 2<sup>nd</sup> Semester, students will be able to understand the basic concepts of operating system along with the memory management techniques through data structure along with database management system that will help them to understand the real life applications by creating database entities. In addition to that students have the complete knowledge data mining techniques and electronic commerce and object oriented programming techniques.

#### **1. Course Outcome(CO)-I-Operating System**

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

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU.
- Evaluate the requirement for process synchronization and coordination handled by operating system.
- Describe and analyze the memory management and its allocation policies.

- Identify use and evaluate the storage management policies with respect to different storage management technologies.
- Identify the need to create the special purpose operating system.

## **2. CO-II- Data Structure**

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

- Select appropriate data structures as applied to specified problem definition.
- Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
- Students will be able to implement Linear and Non-Linear data structures.
- Implement appropriate sorting/searching technique for given problem.
- Design advance data structure using Non Linear data structure.
- Determine and analyze the complexity of given Algorithms.

## **3. CO-III- Relational Database Management System**

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

- Explain the features of database management systems and Relational database.
- Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra.
- Create and populate a RDBMS for a real life application, with constraints and keys, using SQL.
- Retrieve any type of information from a data base by formulating complex queries in SQL.
- Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database.
- Build indexing mechanisms for efficient retrieval of information from a database.

## **4. CO-IV- E Technologies**

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

- Understand the various concepts related to e-commerce.
- Understand the various payment methods and their implementation policy.
- Understand the concept and need of data mining and data warehouse.
- Implement the mining techniques to mine out the required data.

## **5. CO-V-Object oriented programming using C++**

The student after completing the course will be able to:

- Understand the features and relative merits of C++ supporting object oriented programming.
- Gain knowledge of objects, class, data abstraction, encapsulation, inheritance, polymorphism, dynamic binding and apply them in programming in C++.
- Develop and construct programs using Bottom up design approach.

## **6. CO-VI-Software Lab-II (Data Structures and Programming Using C++)**

The student after completing the course will be able to:

- Understand the features and relative merits of C++ to implement various data structure through object oriented programming.

## **7. CO-VII -Software Lab III(SQL)**

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

- Explain the features of database management systems and Relational database.
- Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra.
- Create and populate a RDBMS for a real life application, with constraints and keys, using SQL.
- Retrieve any type of information from a data base by formulating complex queries in SQL.
- Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database.
- Build indexing mechanisms for efficient retrieval of information from a database.

### **Program Specific Outcome (PSO)-III**

After studying 3<sup>rd</sup> Semester, the students will be able to understand the concept related to web designing and creating web based application and windows based application through advanced object oriented programming techniques and to adapt the knowledge related to software lifecycle process and its cost and understand the protocols and its working and network equipment's and communication through general ICT.

### **1. Course Outcome(CO)-I- Web Technologies**

The student after completing the course will be able to

- design and create a media-rich dynamic websites to meet the specifications of clients using text, fonts, colors, images, tables, hyperlinks and other elements using technologies like HTML, CSS, JavaScript, PHP along with MySQL etc.

### **2. CO-II- Java Programming**

The student after completing the course will be able to

- understand the structure and model of the Java programming language.



- familiarize with Java Runtime Environment (JRE), Java Development Kit (JDK), Java Virtual Machine (JVM) and Java compiler.
- write Java application programs using OOP principles and proper program structuring

### **3.CO-III- Software Engineering**

The student after completing the course will be able to

- understand scientific software development processes to meet the needs of an advanced development project.
- plan a required software engineering process life cycle , including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements.
- able to use tools necessary for software project management, time management, etc.
- able to test the required software using black box and white box.

### **4. CO-IV- Computer Networks**

The student after completing the course will be able to

- independently understand basic computer network technology and data communication systems.
- identify the different types of network topologies.
- understand the functions of the layers of the OSI and TCP/IP models.
- identify the different types of network devices and their functions within a network
- familiarity with the basic protocols of computer networks.

### **5. CO-V- Software Lab IV(Web Technology)**

The student after completing the course will be able to

- understand role of server-side programming and databases for creating dynamic websites and web-applications.
- develop web applications using server side PHP programing and Database Connectivity using MySQL.

### **6. CO-VI-Software Lab V(Java Programming)**

The student after completing the course will be able to

- understand the structure and model of the Java programming language.
- familiarize with Java Runtime Environment (JRE), Java Development Kit (JDK), Java Virtual Machine (JVM) and Java compiler.
- write Java application programs using OOP principles and proper program structuring.

### **7. CO-VII- Workshop II (Communication& General ICT)**

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

- Solve the communication paper in different competitive exams.
- Solve the queries related to the issues of general ICT.

### **Program Specific Outcome (PSO)-IV**

After studying 4<sup>th</sup> semester, the students will be able to understand the concepts of graphic designing along with the basics of linux and will use multiple system platforms along with the basic understanding of business needs and use of information technology in business and use of artificial intelligence in the real world. In addition to that students will create a minor project based on the above studied subjects.

#### **1. Course Outcome(CO)-I- Computer Graphics**

The student after completing the course will be able to:-

- Explain the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions.
- Apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.
- Interpret the mathematical foundation of the concepts of computer graphics. describe the fundamentals of animation, parametric curves and surfaces, and spotlighting.
- Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.
- Create effective OpenGL programs to solve graphics programming issues, including 3D transformation, objects modelling, color modelling, lighting, textures, and ray tracing.

#### **2. CO-II- Linux Administration**

The student after completing the course will be able to

- Use multiple computer system platforms, and understand the advantages of each.
- Install and administer network services.
- Protect and secure users' information on computer systems.
- Use the command line interface for system administration.
- Demonstrate strategies for planning/designing systems.
- Install and manage disks and file systems.
- Enable above learning outcomes in Windows and Linux environments.

#### **3. CO-III- Modern Information System**

The student after completing the course will be able to

- Understand how technology can help to improve decision-making in

organizations.

- Learn how technology is used to integrate the business disciplines.
- To introduce students to business cases, so they learn to solve business problems with information technology.
- To introduce students to the strategic applications of technology.
- To introduce students to the issues and problems involved in building complex systems and organizing information resources.
- To introduce students to the social implications of information technology.

#### **4. CO-IV- Artificial Intelligence**

On completion of the course students will be able to:

- Understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques.
- Apply these techniques in applications which involve perception, reasoning and learning.
- Explain the role of agents and how it is related to environment and the way of evaluating it and how agents can act by establishing goals.
- Acquire the knowledge of real world Knowledge representation.
- Analyze and design a real world problem for implementation and understand the dynamic behavior of a system.
- Use different machine learning techniques to design AI machine and enveloping applications for real world problems.

#### **5. CO-V- Software Lab VI(Computer Graphics)**

The student after completing the course will be able to:-

- Explain the core concepts of computer graphics, including viewing, projection, perspective, modelling and transformation in two and three dimensions.
- Apply the concepts of color models, lighting and shading models, textures, ray tracing, hidden surface elimination, anti-aliasing, and rendering.
- Interpret the mathematical foundation of the concepts of computer graphics. describe the fundamentals of animation, parametric curves and surfaces, and spotlighting.
- Identify a typical graphics pipeline and apply graphics programming techniques to design and create computer graphics.
- Create effective OpenGL programs to solve graphics programming issues, including 3D transformation, objects modelling, color modelling, lighting, textures, and ray tracing.

#### **6. CO-VI- Software Lab VII(Linux)**

The student after completing the course will be able to

- Use multiple computer system platforms, and understand the advantages of each.
- Install and administer network services.
- Protect and secure users' information on computer systems.
- Use the command line interface for system administration.
- Demonstrate strategies for planning/designing systems.
- Install and manage disks and file systems.
- Enable above learning outcomes in Windows and Linux environments.

## **7. CO-VII- Project**

The student after completing the course will be able to:-

- Identify the requirement for the real world problems and to understand the programming language concepts and basics of software development life cycle model for the implementation of the project.
- Conduct a survey of several available literature in the preferred field of study.
- Study and enhance software/hardware skills.
- Demonstrate and build the project successfully by hardware requirements, coding and testing.
- To plan, analyze, design and implement a software project using SDLC model.
- To report and present finding of the study conducted in preferred domain.
- Demonstrate and ability to work in teams.