

Department of Computer Science

BCA

Programme Outcomes

The program focuses on the skill enhancement of students in which following skills are enhanced.

- Improve their computer literacy, their basic understanding of operative systems and a working. Knowledge of software commonly used in academic and professional environments.
- Knowledge of software commonly used in academic and professional environments
- Knowledge of software commonly used in academic and professional environments.
- Learn how to organize information efficiently in the forms of outlines, charts, etc. by using appropriate software. Develop the skills to present ideas effectively and efficiently.
- Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
- Develop IT-oriented security issues and protocols. Design and implement a web page.
- Improve communication and business management skills, especially in providing technical support. Serve as the System Administrators with thorough knowledge of DBMS.
- Understand, analyse and develop computer programmes in the areas related to algorithms, web design, mobile application design.
- Apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.
- To demonstrate advanced skills in effective analysis design and realization of business system utilizing contemporary information technology.

This program fit the students for following job role

- Software Developer
- Network Engineer
- Web Developer
- Programmer
- Software Tester
- System Analyst

COURSE OUTCOMES

COURSE NAME: Fundamentals of Information Technology

CLASS - BCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.

COURSE NAME: Programming Fundamentals using C

CLASS – BCA SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Digital Electronics

CLASS – BCA SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Convert numbers from one number system to another.
- Represent information using Binary Codes.
- Draw Logic circuit Diagrams and write Truth Tables for the functions.
- Solve and minimize expressions of Boolean algebra.
- Draw Combinational Circuits and Sequential Circuits.
- Perform address selection in semiconductor memory chips.

COURSE NAME: Data Structures

CLASS - BCA SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
 - Define basic, static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms.
 - Demonstrate advantages and disadvantages of specific algorithms and data structures
 - Select basic data structures and algorithms for autonomous realization of simple programs or program parts
 - Determine and demonstrate bugs in program, recognize needed basic operations with data structures
 - Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,
 - Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.
- **Intellectual Skills:**
 - Ability to define the computer science problems.
 - Ability to drive different solution alternatives for the computer science problems.
 - Ability to analyze the solution alternatives and choose the optimum one
- **Practical Skills:**
 - Design, build and develop programs of varying levels of complexity.
- **Transferable Skills:** Knowledge of the concepts and material presented in this course will provide the students with the capability to:
 - Use data structures effectively to solve practical problems.
 - Write and present effective computer programs that employ efficient algorithms.
 - Work in stressful environment and within constraints.
 - Search for information and adopt life-long self-learning

Semester-3

COURSE NAME: Fundamentals of Database Management System

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :** Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Computer System Organization and Architecture

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Students will know about registers, various types of registers and interfacing various registers.
 - Students will learn about the architecture of common bus system.
 - Students will learn about the different micro-operations used.
 - Students will learn about Design of basic computer.
 - Students will learn about Instruction Cycle, Interrupt Cycle.
 - Students will understand about various kinds of memories used, memory hierarchy.
 - Students will teach about I/O interface, DMA controller, modes of data transfer.
 - Students will learn about difference between pipeline and vector processing.

COURSE NAME: Object Oriented Programming using C++

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Able to know how to do programming in C++ environment.
 - Able to understand and implement the concepts of object oriented approach using C++.
 - Able to acquire in depth knowledge and develop software in C++
- **Intellectual (Cognitive/ Analytical) Skills:**
 - identify different class attributes, member functions, base class and derived class and their relationships among them
 - learn how to reuse the code using polymorphism
 - understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - To solve a real life existing problems using the features of C++
 - To develop software/ big and complex programs for a complex problems
 - Implement advance features of object oriented approach in other various language(s).

Semester 4

COURSE NAME: Computer Networks

CLASS - BCA SEMESTER – 4

Course Outcomes

After studying this course:

- Students will know what are network and its types.
- Students will learn about the different topologies used in network.
- Students will understand different protocols used in internet.
- Students will understand and be able to describe the differences between intranet, extranet and internet.
- Students will understand about various multiplexing and switching techniques used in networks.

COURSE NAME: Management Information System

CLASS - BCA SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems. 4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

COURSE NAME: Relational Database Management Systems with Oracle

CLASS – BCA SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction.
- Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
- Analyze and Select storage and recovery techniques of database system.

Semester5

COURSE NAME: System Analysis and Design

CLASS - BCA SEMESTER – 5

- **Knowledge and Understanding:**
 - Understand the principles and tools of systems analysis and design
 - Understand the application of computing in different context
 - Understand the professional and ethical responsibilities of practicing the computer professional including understanding the need for quality
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Solve a wide range of problems related to the analysis, design and construction of information systems - Analysis and Design of systems of small sizes

Course Outcomes

After studying this course, students should be able to:

COURSE NAME: System Software

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should able to:

- Understand the functions, features and design options of macro processors.
- Understand the functions and design options of loader, editor structure and functions and capabilities of an interactive debugging system.
- Analyze the working of Lexical analyzer (LEX) and Parser tool (YACC)
- Understand the proficiency in software development cost estimation, testing methodologies and author a software testing plan.

COURSE NAME: Java Programming

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
 - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

- Understand use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
 - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
 - Develop computer-based systems.

COURSE NAME: Web Designing using HTML and DHTML

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

Semester-6

COURSE NAME: E-Commerce

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.
- Describe how procurement and supply chains relate to B2B E-commerce.

COURSE NAME: Operating Systems

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should 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

COURSE NAME: Software Engineering

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- Understanding the issues affecting the organization, planning and control of software-based systems development.
- Complete the analysis and design of software intensive systems.
- Read and understand the professional and technical literature on software engineering.

COURSE NAME: Web Designing using ASP.Net

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- To develop WebPages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and its connectivity with Server Side scripting language.
- To develop Web Applications with MySQL/SQL as backend.

B.Voc(Cyber Security)

Program Outcomes

The program focuses on the skill enhancement of students in Cyber Security in which following skills are enhanced.

- To identify, analyse and remediate computer security breaches by learning and implementing the real-world scenarios
- To provide students with a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cybercrime left in digital storage devices
- To gain industrial exposure through Industrial Internship in cyber security
- To make them employable according to the current demands of cyber security and IT-oriented security issues and protocols.

This program makes the students able for following job roles:

NSQF LEVEL	Job Role
4	Junior Software Developer
5	Web Developer

COURSE OUTCOMES

COURSE NAME: Fundamentals of Computer and Cyber Security

CLASS - B.Voc. (CS) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation softwares to solve basic information systems problems.
- Understand the basics of cyber security

COURSE NAME: Web Designing using HTML and DHTML

CLASS - B.Voc(CS) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

COURSE NAME: Computer Programming using C

CLASS - B.Voc(CS) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Fundamentals of DBMS

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Fundamentals of Cyber Security

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Analyze and evaluate the cyber security needs of an organization.
- Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems.
- Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- Design operational and strategic cyber security strategies and policies.

COURSE NAME: Programming using C++

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
 - Able to know how to do programming in C++ environment.
 - Able to understand and implement the concepts of object oriented approach using C++.
 - Able to acquire in depth knowledge and develop software in C++
- **Intellectual(Cognitive/ Analytical) Skills:**
 - identify different class attributes, member functions, base class and derived class and their relationships among them
 - learn how to reuse the code using polymorphism
 - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - to solve a real life existing problems using the features of C++
 - to develop software/ big and complex programs for a complex problems
 - Implement advance features of object oriented approach in other various language(s).

B.Voc. (Software Development)

Programme Outcomes

The program focuses on the skill enhancement of students in Software Development in which following skills are enhanced.

- Improve their computer literacy, their basic understanding of operative systems and working of computer. Knowledge of software commonly used in academic and professional environments.
- Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
- Use the Systems Analysis Design paradigm to critically analyze a problem. Solve the problems (programming networking database and Web design) in the Information Technology environment. Function effectively on teams to accomplish a common goal and demonstrate professional behaviour.
- Develop IT-oriented security issues and protocols. Design and implement a web page.
- Apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.
- Acquaintance with latest trends in software development and thereby innovate new ideas in the area of software development.
- Conceptual grounding in computer usage as well as its practical business applications.
- To demonstrate advanced skills in the effective analysis designing and realization of business system utilizing in contemporary information technology.

This program fits the students for following job roles

NSQF LEVEL	Job Role
4	Junior Software Developer
5	Web Developer
6	Master Trainer for Junior Software Developer
7	Software Developer

COURSE OUTCOMES

COURSE NAME: Fundamentals of Computer and Software Development

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use system development, word-processing, spreadsheet, and presentation softwares to solve basic information system problems.

COURSE NAME: Web Designing using HTML and DHTML

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

COURSE NAME: Computer Programming using C

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this course the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages can become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Fundamentals of DBMS

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Fundamentals of Windows and Server Administration

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Use administrative techniques and tools in Windows Server 2008.
- Implement identity Services.
- Manage network infrastructure services.
- Configure file servers and storage.
- Perform upgrades and migration related to AD DS, and storage.

COURSE NAME: Data Structure

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
 - Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms.
 - Demonstrate advantages and disadvantages of specific algorithms and data structures,
 - Select basic data structures and algorithms for autonomous realization of simple programs or program parts
 - Determine and demonstrate bugs in program, recognize needed basic operations with data structures
 - Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,

- Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.
- **Intellectual Skills:**
 - Ability to define the computer science problems.
 - Ability to drive different solution alternatives for the computer science problems.
 - Ability to analyze the solution alternatives and choose the optimum one
- **Practical Skills:**
 - Design, build and develop programs of varying levels of complexity.
- **Transferable Skills:** Knowledge of the concepts and material presented in this course will provide the students with the capability to:
 - Use data structures effectively to solve practical problems.
 - Write and present effective computer programs that employ efficient algorithms.
 - Work in stressful environment and within constraints.
 - Search for information and adopt life-long self-learning
- **COURSE NAME: Fundamentals of Computer and Software Development**

Semester-3

COURSE NAME: Software Engineering

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understanding the issues affecting the organisation, planning, and control of software-based systems' development.
- Complete the analysis and design of software intensive systems.
- Read and understand the professional and technical literature on software engineering.

COURSE NAME: Programming with Java

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Implement Object Oriented programming concept using basic syntaxes of control structures, strings and function for developing skills of logic building activity.
 - Identify classes, objects, members of a class and the relationships among them required for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

- Understand and use of different exception handling mechanisms and concepts of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
 - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
 - Develop computer-based systems.

COURSE NAME: Programming using C++

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Able to know how to do programming in C++ environment.
 - Able to understand and implement the concepts of object oriented approach using C++.
 - Able to acquire in depth knowledge and develop software in C++
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Identify different class attributes, member functions, base class and derived class and their relationships among them
 - Learn how to reuse the code using polymorphism
 - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - To solve a real life existing problems using the features of C++
 - To develop software/ big and complex programs for a complex problems
 - Implement advance features of object oriented approach in other various language(s).

Semester

4

COURSE NAME: Web Development using PHP and MYSQL

CLASS - B. Voc (SD) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Create web applications using PHP and MySQL
- Connect PHP web application with MySQL database.
- Send and receive data to and from database.

COURSE NAME: Content Management System

CLASS - B. Voc (SD) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- create website using Joomla
- create user with different roles
- backup and restore website
- online their website

Semester5

COURSE NAME: Web Development using ASP.Net

CLASS - B. Voc (SD) SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- To develop Web pages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side Scripting language.
- To develop Web Applications with MySQL/SQL as backend.

COURSE NAME: Software Testing Concepts and Tools

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Design test planning.
 - Manage the test process.
- **Intellectual Cognitive/Analytical Skills:**
 - Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
 - Implement various test processes for quality improvement.
 - To handle types of errors and fault models
- **Practical Skills:**

- Use practical knowledge in various ways to test software and an understanding of some of the tradeoffs between testing techniques.
 - Generate various test documents.
 - Identify and apply appropriate automated testing tool.
- **Transferable Skills:**
 - Apply the software testing techniques in commercial environment.
 - Perform various types of software testing like E-commerce websites, Real time software testing, Multiplatform testing, Security Testing, Client server testing.

Semester-6

Project Dissertation (Industrial Training and Project in Software/IT industry)

PGDCA

Programme Outcomes

The program focuses on the skill enhancement of students in which following skill component are enhanced.

- To train students in the latest trends of Application Development, Programming Languages and Database Management.
- To enhance their career opportunities in the software development and maintenance sector in the state.
- To expose the students to Open Source Technologies so that they become familiar with it and can seek appropriate opportunity in trade and industry.
- To give hands on experience to students while developing real life IT application as part of the study.
- To augment the knowledge base of the students, through various activities which will be complementary to the theoretical studies.

COURSE OUTCOMES

COURSE NAME: Fundamentals of Information Technology

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.

COURSE NAME: Operating Systems

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should 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

COURSE NAME: Problem Solving using C

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

SEMESTER – 2

COURSE NAME: Database Management System

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course, students should be able to:

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL
- **Transferable skills:** Usage of DBMS design and administration

COURSE NAME: Introduction to Computer Network, Internet and E-Commerce

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course,

- Students will know what is network, its types.
- Students will learn about the different topologies used in network.
- Students will understand different protocols used in internet.
- Students will understand and be able to describe the differences between intranet, extranet and internet.
- Students will understand about Commerce

COURSE NAME: Object Oriented Programming using C++

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course, students should be able to:

- Write, compile and debug programs in C++language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

M. Sc (Information Technology)

Programme Outcomes

The program focuses on the skill enhancement of students in which following skill component are enhanced.

- Will have the ability to communicate computer science concepts, designs, and solutions effectively and professionally. Apply knowledge of computing to produce effective designs and solutions for specific problems. Identify, analyze, and synthesize scholarly literature relating to the field of computer science; and use software development tools, software systems, and modern computing platforms.
- Work in a collaborative manner with others in a team, contributing to the management, planning and implementation of a computer system.
- Independently propose a small scale research project, plan its execution, undertake its development, evaluate its outcome and report on its results in a professional manner.
- Advance knowledge through innovation and knowledge creation. Pursue life-long learning in practice. Interpret and present theoretical issues and empirical findings
- Gains understanding about techniques, technologies and methods used in managing and implementing information technology systems.
- Widens and deepens understanding of computing technologies and covers high level concepts that enable the effective management and planning of IT project and services.
- High level strategy and design in-depth technical specializations, management and planning of IT project and services.

This program fit the students for following job role:-

- Software Developer
- Hardware Engineer
- Database Engineer
- Web Developer

COURSE OUTCOMES

COURSE NAME: Introduction of Information Technology

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- Have basic knowledge of computer hardware and software;
- Understand business areas to which computers may be applied;

- Provide an introduction to business organisation and information systems;
- Develop the skills in communication, verbal and written, which play an important part in business computing and information processing;

COURSE NAME: Computer Programming using C

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Write, compile and debug programs in C language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

COURSE NAME: Computer Organization and Architecture

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Understand the basics of computer hardware and how software interacts with computer hardware
- Analyze and evaluate computer performance
- Understand how computers represent and manipulate data
- Understand computer arithmetic and convert between different number systems
- Assemble a simple computer with hardware design including data format, instruction format, instruction set, addressing modes, bus structure, input/output, memory, Arithmetic/Logic unit, control unit, and data, instruction and address flow
- Use Boolean algebra as related to designing computer logic, through simple combinational and sequential logic circuits

COURSE NAME: Mathematical Foundation of Computer Science

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Be familiar with the basic terminology of functions, relations, sets and demonstrate knowledge of their associated operations.
- Be able to solve advanced mathematical problems, apply various methods of mathematical proof, and communicate solutions in writing
- Become capable to comprehend advanced mathematics, and present the material orally and in writing
- Utilize the knowledge of computing and mathematics appropriate to the discipline.
- Evaluate mathematical principles and logic design

COURSE NAME: Operating Systems

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Learn the mechanisms of OS to handle processes and threads and their communication Use different data types, operators and console I/O function in a computer program.
- Learn the mechanisms involved in memory management in contemporary OS.
- Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.
- Understand different approaches to memory management.
- Understand the structure and organization of the file system

Semester-2

COURSE NAME: Object Oriented Programming Using C++

CLASS –M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Write, compile and debug programs in C++language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

COURSE NAME: Data and File Structures

CLASS - M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Be familiar with basic data structure of algorithms.
- Design and analyze programming problem statements
- Choose appropriate data structures and algorithms and use it to design algorithms for a specific problem.
- Handle operations like searching, insertion, deletion and traversing mechanism
- Come up with analysis of efficiency and proofs of correctness

COURSE NAME: Visual Basic

CLASS –M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Design, create, build, and debug Visual Basic applications.
- Explore Visual Basic's Integrated Development Environment (IDE).
- Write and apply decision structures for determining different operations.
- Understand and identify the fundamental concepts of object-oriented programming.
- Perform tests, resolve defects and revise existing code.

COURSE NAME: RDBMS and Oracle

CLASS –M. Sc. (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Gain the knowledge and understanding of Database analysis and design.
- Understand the use of Structured Query Language (SQL) and learn SQL syntax.
- Gain the knowledge of the processes of Database Development and Administration using SQL and PL/SQL.
- Understand the functional dependencies and design of the database
- Understand the concept of Transaction and Query processing

Semester-3

COURSE NAME: Web Technology

CLASS – M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, Javascript, VBScript, ASP, PHP and protocols in the workings of the web and web applications
- Analyze a web project and identify its elements and attributes in comparison to traditional projects.
- Create web pages using HTML, DHTML and Cascading Styles sheets.
- Analyze and build interactive web applications using ASP and ASP.NET.
- Build web applications using PHP, XML documents and XML Schema, and consume web services.

COURSE NAME: Java Programming

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
 - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
 - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
 - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
 - Develop computer-based systems.

COURSE NAME: Software Engineering

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Plan a 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 elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project.
- Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
- Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice.
- Able to use modern engineering tools necessary for software project management, time management and software reuse.

COURSE NAME: Computer Networks

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understand basic computer network technology.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme.
- Discuss the elements and protocols of transport layer

Semester4

COURSE NAME: Computer Graphics

CLASS –M. Sc (IT) SEMESTER – 4

- Demonstrate an understanding of contemporary graphics hardware.
- Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
- Functions to implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.

Course Outcomes

After studying this course, students should be able to:

COURSE NAME: Linux Administration

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Understand the basic set of commands and editors in Linux operating system.
- Perform shell programming in Linux operating system
- Demonstrate the role and responsibilities of a Linux system administrator.
- Distinguish various filter and server commands

COURSE NAME: Modern Information Systems

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems.
- Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

COURSE NAME: Artificial Intelligence

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

MCA

Programme Outcomes

The program focuses on the skill enhancement of students in Computer Application in which following skills are enhanced:

- Apply the knowledge of mathematics and computing fundamentals to various real life situations for any given environment.
- Design and develop applications to analyze and solve all computer science related problems.
- Design applications for any desired needs with appropriate considerations for any specific need on societal and environmental aspects.
- Analyze and review literatures to invoke the research skills to design, interpret and make inferences from the resulting data.
- Integrate and apply efficiently the contemporary IT tools to all computer applications.
- Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations
- Involve in perennial learning for a continuous career development and progress as a computer professional
- Function effectively both as a team leader and team member on multi disciplinary projects to demonstrate computing and management skills
- Communicate effectively and present technical information in oral and written reports
- Utilize the computing knowledge efficiently in projects with concern for societal, environmental, and cultural aspects
- Function competently as an individual and as a leader in multidisciplinary projects
- Create and design innovative methodologies to solve complex problems for the betterment of the society
- Apply the inherent skills with absolute focus to function as an successful entrepreneur

This program fit the students for following job role:-

- Software Developer
- Hardware Engineer
- Database Engineer
- Cloud Architect
- Data Scientist
- Web Developer
- Network Engineer

COURSE OUTCOMES

SEMESTER – 3

COURSE NAME: Design and Analysis of Algorithms

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
- Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.
- Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
- Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, and synthesize new graph algorithms.

COURSE NAME: Software Engineering

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
- Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
- Deliver quality software products by possessing the leadership skills as an individual or contributing to the team development and demonstrating effective and modern working strategies by applying both communication and negotiation management skill.
- Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.

COURSE NAME: Decision Support Systems

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- describe the decision-making process, the concepts and principles of a decision support system.
- identify decision support tools that can aid decision making.
- apply system development methodology to develop a decision support system.
- develop a functional prototype of a decision support system for a given case.

COURSE NAME: Programming in Java

CLASS - MCA SEMESTER – 3

Course Outcomes

- **Knowledge and Understanding:**
 - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
 - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
 - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
 - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
 - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
 - Develop computer-based systems.

COURSE NAME: Organisation Behaviour and Development

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.
- Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
- Analyze the complexities associated with management of the group behavior in the organization. Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization.

COURSE NAME: System Software

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand the functions, features and design options of macro processors.
- Understand the functions and design options of loader, editor structure and functions and capabilities of an interactive debugging system.
- Analyze the working of Lexical analyzer (LEX) and Parser tool (YACC)
- Understand the proficiency in software development cost estimation, testing methodologies and author a software testing plan.

COURSE NAME: Computer based Optimization Techniques

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Relate key concepts and applications of various optimization techniques
- Identify the appropriate optimization technique for the given problem
- Formulate appropriate objective functions and constraints to solve real life optimization problems.

COURSE NAME: Data Mining and Data Warehousing

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions.
- Understand KDD process for finding interesting pattern from warehouse.
- Remove redundancy and incomplete data from the dataset using data preprocessing methods.
- Characterize the kinds of patterns that can be discovered by association rule mining.
- Discover interesting patterns from large amounts of data to analyze for predictions and classification.
- Develop a data mining application for data analysis using various tools.

COURSE NAME: ERP Systems and Processes

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Make basic use of Enterprise software, and its role in integrating business functions
- Analyze the strategic options for ERP identification and adoption.
- Design the ERP implementation strategies.
- Create reengineered business processes for successful ERP implementation.

SEMESTER – 4

COURSE NAME: Operating Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students 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

COURSE NAME: Data Communication and Computer Networks

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand basic computer network technology.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme.
- Discuss the elements and protocols of transport layer

COURSE NAME: Web Programming using ASP.Net

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- To develop WebPages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side Scripting language.
- To develop Web Applications with MySQL/SQL as backend.

COURSE NAME: Business Intelligence

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe the concepts and components of Business Intelligence (BI).
- Critically evaluate use of BI for supporting decision making in an organisation.
- Understand and use the technologies and tools that make up BI (e.g. Data warehousing, Data reporting and use of Online Analytical Processing (OLAP)).
- Understand and design the technological architecture that underpins BI systems.
- Plan the implementation of a BI system.

COURSE NAME: Object Oriented Modeling and design using UML

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Model the software development life cycle
- Understand the UML notation and symbols
- Implement the object-oriented approach to analyzing and designing systems and software solutions
- employ the UML notation to create effective and efficient system designs

COURSE NAME: Embedded Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions.
- Get familiarized with programming environment to develop embedded solutions.
- Program ARM microcontroller to perform various tasks.
- Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.

COURSE NAME: Compiler Design

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand fundamentals of compiler and identify the relationships among different phases of the compiler.
- Understand the application of finite state machines, recursive descent, production rules, parsing, and language semantics.
- Analyze & implement required module, which may include front-end, back-end, and a small set of middle-end optimizations.
- Use modern tools and technologies for designing new compiler.

COURSE NAME: Software Testing and Quality Assurance

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe software engineering testing process
- Describe the quality assurance process and its role in software development.
- Demonstrate variety of testing techniques, methods, and tools.

- Describe the state of the practice verification and validation techniques.
- Demonstrate proficiency in managing a software project to customer requirements.

COURSE NAME: Graph Theory

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Apply theories and concepts to test and validate intuition and independent mathematical thinking in problem solving.
- Integrate core theoretical knowledge of graph theory to solve problems.
- Reason from definitions to construct mathematical proofs
- Evaluate and synthesize published research papers.
- Analyze new networks using the main concepts of graph theory.

SEMESTER – 5

COURSE NAME: Artificial Intelligence

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

COURSE NAME: Computer Graphics

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate an understanding of contemporary graphics hardware.
- Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
- Functions to implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.

COURSE NAME: Theory of Computation

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- design Finite Automata machines for given problems;
- analyze a given Finite Automata machine and find out its Language;
- design Pushdown Automata machine for given CF language(s);
- generate the strings/sentences of a given context-free languages using its grammar;
- design Turing machines for given any computational problem

COURSE NAME: E-Commerce

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.
- Describe how procurement and supply chains relate to B2B E-commerce.

COURSE NAME: Software Project Management

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Identify the different project contexts and suggest an appropriate management strategy.
- Practice the role of professional ethics in successful software development.
- Identify and describe the key phases of project management.
- Determine an appropriate project management approach through an evaluation of the business context and scope of the project.

COURSE NAME: Cloud Computing

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Understand the concepts, characteristics, delivery models and benefits of cloud computing
- Understand the key security and compliance challenges of cloud computing
- Understand the key technical and organisational challenges
- Understand the different characteristics of public, private and hybrid cloud deployment models.

COURSE NAME: Network Security

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Identify some of the factors driving the need for network security
- Identify and classify particular examples of attacks
- Define the terms vulnerability, threat and attack
- Identify physical points of vulnerability in simple networks
- Compare and contrast symmetric and asymmetric encryption systems along with their vulnerability to attack, and explain the characteristics of hybrid systems.

COURSE NAME: Ethical Hacking

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Plan a vulnerability assessment and penetration test for a network.
- Execute a penetration test using standard hacking tools in an ethical manner.

- Report on the strengths and vulnerabilities of the tested network.
- Identify legal and ethical issues related to vulnerability and penetration testing.

COURSE NAME: Data Science & Machine Learning

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Develop relevant programming abilities.
- Demonstrate proficiency with statistical analysis of data.
- Develop the ability to build and assess data-based models.
- Execute statistical analyses with professional statistical software.
- Demonstrate skill in data management.

Semester-6

Project Dissertation (Industrial Training and Project in Software/IT industry)