

## PG Department of Computer Science

### Name of Programme: BCA

#### Programme Outcomes

- PO 1: This programme inculcates the basic understanding of Computer and Computer Programming Languages in students so that they can have complete knowledge about the system and its inner working details.
- PO 2: This programme aware the students about the high use of Computers in various fields and increasing number of Jobs in this field.
- PO 3: This programme make the students well versed with the computing environment and the various concepts, topics and subjects related to this field.
- PO 4: This Programme enables the students to have the complete understanding of various branches of Computer and Technology such as Computer Graphics, Operating Systems and Data Structures.

#### Programme Specific Outcomes

- PSO 1: This Programme specifically provides better Job Opportunities to the students and professional knowledge in the field of Programming Languages like C, C++ and Java etc.
- PSO 2: This programme will provide the students with complete insight details of the technical subjects of this field like Computer Architecture, Computational Problem Solving using Python, Digital Electronics and Discrete Mathematics. All these technical subjects will help them to grab a Job Opportunity and work in an efficient way in their respective fields.
- PSO 3: The present era of technology is highly demanding the employees with thorough practical training in their required practical approach. This Programme enables the students specifically to solve the real world problems practically and enrich their skills in research and jobs.
- PSO 4: The programme specifically increases the computer depth knowledge in students so that they can pursue their carrier in this field and take subsequent advantages from the programme course work.

#### Mapping of Course Outcomes

##### BCA Semester I

##### Paper I: Introduction to Programming- C

Course Outcome	Skill	PO	Bloom's Level	Assessing Tools can be used to measure CO
CO1: Ability to learn programming skills	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to design algorithms	Apply	PO2	L3	Exam / Assignment / Seminar
CO3: Ability to convert algorithms into code	Apply	PO3	L3	Exam / Assignment / Lab
CO4: Ability to handle possible errors during program execution.	Analyze	PO4	L4	Group discussions / Lab

### Paper II: Introduction to Computers and Information Technology

Course Outcome	Skill	PO	Blooms Level	Assessing Tool can be used to measure CO
CO1: This paper categorize the fundamental information about computer and its working.	Understand	PO1	2	Exam/Assignment
CO2: Students discover the fundamental concept of computers with their present level of knowledge about computers.	Understand	PO1 PO2	2	Exam/Assignment/Quiz
CO3: This paper simplify Microsoft Office programs which enable the students to create professional and academic documents.	Apply	PO2 PO3	3	Exam/Assignment/Quiz/Practical Implementation
CO4: Students elaborate various accounting related operations in MS Excel and presentation skills by using MS PowerPoint which makes them able to work in field of office automation and desktop publishing as well.	Apply	PO3	3	Exam/Assignment/Quiz/Practical Implementation

### Paper III: Applied and Discrete Mathematics

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper demonstrate the mathematical fundamentals topics to students	Remember, understand	1	1,2	Exam/Assignment/Quiz
CO2: Boolean Algebra is demonstrated through this course structure, so that students can prepare themselves for further understanding of topics related to other subjects of programme.	Understand	1,2	2	Exam/Assignment/Quiz/ viva voce
CO3: This summarize the concepts to the students in many competitive exams that act as a base for reasoning, quantitative techniques and graph theory as well.	Apply	4	3	Exam/Assignment/Quiz/Group discussion/viva voce

## Semester-II

### Paper I: Introduction to Programming-C++

Course Outcome	Skill	PO	Blooms Level	Assessing Tool can be used to measure CO
CO1: This paper illustrates the concepts of C programming language and illustrates the concept of object oriented programming languages so that students can learn about the real time problem solving techniques.	Understand	PO1	2	Exam/Assignment
CO2: Specialized course work can be used for developing different applications, games, animations, web browser, database software, compilers etc., giving students a lot of opportunities in IT Industries as well.	Apply	PO2	3	Exam/Assignment/Quiz/Practical Implementation
CO3: Expansion of this paper is being used in system programming and embedded systems for the establishment of Computer Aided Designs and Computer Aided Manufacturing purposes also.	Understand	PO3 PO4	2	Exam/Assignment/Quiz/Practical Implementation
CO4: This Course rephrase the level of Logical and Analytical Thinking in Students so that they can give more emphasis on real world problem solving techniques and methods.	Apply	PO2 PO3	3	Exam/Assignment/Quiz/Practical Implementation
CO5: C++ inculcates all the required concepts, methodologies and structure oriented guidance in Students which motivates them to be a Good Programmer in future.	Apply	PO3 PO4	3	Exam/Assignment/Quiz/Practical Implementation

### Paper II: Principles of Digital Electronics

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper allows students to analyze the internal circuitry of the processor and memory in detail explaining about process creation, performance of various calculations, number system, number conversions and K-Mapping techniques.	Understand, Analyze	PO 1	2,4	Exam/Assignment/Quiz/seminar/viva voce
CO2: It categorize the mathematical foundation going inside the system for the bits transfer inside the processor, converting sum of product forms into product of sum forms, generating the read-write cycles and memory writing timing diagrams	understand	PO 3	2	Exam/Assignment/Quiz/ viva voce

CO3: Digital Electronics makes students summarize about the internal mechanism of Arithmetic Logical Unit inside the processor performing various calculations and manipulations	Understand, Apply	PO 1, PO 3	2,3	Exam/Assignment/Quiz/Group discussion/viva voce
CO4: This paper will motivate students to make their own hardware live projects	Create	PO 4	6	Exam/Assignment/Quiz/ viva voce

### Paper-III: Numerical Methods and Statistical Techniques

Course Outcome	Skill	PO	Bloom's Level	Assessing Tools can be used to measure CO
CO1: Ability to learn different techniques to perform statistical analysis of data, understand error, source of error and its affect on any numerical computation.	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to apply different numerical methods to obtain solution of non linear equations	Apply	PO3	L3	Exam / Assignment / Seminar
CO3: Proficiently and critically use a range of numerical methods for the analysis and solution of engineering problems, including an understanding of alternative approaches and their limitations	Analyze, design	PO4	L4	Exam / Assignment / Seminar/ Lab
CO4: Ability to develop critical and analytic thinking skills to pursue carrier in research and development field.	Analyze, design, team work	PO2	L4	Group discussions / Lab

### Semester-III

#### Paper I: Computer Architecture

Course Outcome	Skill	PO	Bloom's Level	Assessing tools can be used to measure CO
CO1: This paper demonstrates the way the hardware components operate and how they are connected together to form the computer system	Apply Understand Design	PO4, PO5	2	Exam/Assignment/test/ Discussion/ /
CO2: This demonstrates the system components, circuit design, logical design, structure of instruction, computer arithmetic, processor control, assembly programming and methods of performance enhancement.	Understand Design	PO2	3	Assignment/ Quiz/ Discussion/
CO3: This paper is especially designed for the students to learn hardware details so that they can work in the Field of Hardware Engineering and be able to develop Hardware Live Projects also.	Understand Design Apply	PO3 PO4	4	Assignment/ Quiz/ Discussion/seminars

### Paper II: Database Management System

Course Outcome	Skill	PO	Bloom s Level	Assessing tools can be used to measure CO
CO1: This paper is very significant for the graduate students as it delivers details of database systems and its design	Understand, Apply	PO 1, PO 2	2,3	Exam/Assignment/Quiz/Practical viva voce
CO2: It constructs big role in all types of industry/institutions because all kind of necessary data is to be stored in database	Apply, Create	PO 2	3,6	Exam/Assignment/Quiz/ viva voce
CO3: This paper also organizes the design and implementation of databases and generates opportunity for students to become data managers	Apply, Analyze	4	3,4	Exam/Assignment/Quiz/Group discussion/Practical
CO4: It provides opportunity for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future	Apply, Evaluate	3,4	3,5	Exam/Assignment/Quiz/Practical viva voce

### Paper III: Introduction to Python

Course Outcome	Skill	PO	Bloom s Level	Assessing tools can be used to measure CO
CO1: This paper is specially designed for providing demonstration of programming to students.	Understand Apply	PO 1	2,3	Exam/Assignment/seminar /viva voce
CO2: Going from the basics to complete detail of the programming concept, this paper enables students to apply their own logics in computer system	Apply	PO 2	3	Exam/Assignment/Practical/ viva voce
CO3: It is being widely used in various companies and MNCs, therefore this will help students to get survey for their training projects after placements	Analyze	PO 3	4	Exam/Assignment/Practical
CO4: Students can build up their own software projects by using the syntaxes and semantics of this programme.	Analyze, Create	PO 3	4,6	Exam/Assignment/Practical /viva voce
CO5: The basic foundation of this particular subject will raise the interest of students in other high level programming languages to accomplish the need of becoming a successful Software Developer	Apply	PO 4	3	Exam/Assignment/Practical

## Semester-IV

### Paper I: Data structure & File Processing

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Understand and remember algorithms and its analysis procedure. 2 Introduce the concept of data structures through ADT including List, Stack, Queues.	Understand	PO 1	2	Exam/Assignment/Quiz/ Discussion/ Practical viva voce/ Run the programme/ project / seminar
CO2: To design and implement various data structure algorithms. 4 To introduce various techniques for representation of the data in the real world.	Understand Apply	PO 3	3	Exam/Assignment/Quiz/ Discussion
CO3: To develop application using data structure algorithms.	Remember Understand	PO 3	2	Exam/Assignment/Quiz/ Discussion
CO4: Compute the complexity of various algorithms	Analyze	PO 2	4	Exam/Assignment/Quiz/ Discussion

### Paper II: Information System

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper carries importance because information system management act as distinguisher for all industries/institutions by the use of information technology	Understand,	PO 1	2	Exam/Assignment/Quiz/seminar /viva voce
CO2: This paper is best suitable for all the students who want to build their carrier in the system analyst, system designer and system manager as these are special jobs for new system development and design	understand	PO 2, PO 3	2	Exam/Assignment/Quiz/ viva voce
CO3: Students can also get good opportunity in various business verticals like accounting information system, inventory management, human resource management system	Apply	PO 4	3	Exam/Assignment/Quiz/Group discussion/viva voce
CO4: This paper is very much recommended in various levels of business like TPS, MIS, DSS, and ESS	Analyze	PO 2, PO 3	4	Exam/Assignment/Quiz/ viva voce
CO5: Students can get good jobs according to their interest and develop themselves in higher management positions	Understand	PO 2	2	

### Paper III: Internet Applications

Course Outcome	Skill	PO	Bloom s Level	Assessing tools can be used to measure CO
CO1: This paper demonstrates various concepts related to Internet where students will learn about the Connection Establishment, configuring the network, trouble shoot the network etc.	Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO2: Students learn about the various measures being used for securing the network along with the help of Internet Protocols and increase in the use various Security Firewalls	Remember	PO 1	1	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO3: Paper illustrates suitable information to students in order to get maximized advantages from the network by implementing an accurate type of Topology and Connecting Computer System in proper Order.	Apply	PO 2	3	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO4: Students can pursue their carrier in the field of Network Security and Network Coordination which is presently in high demand throughout the Industry.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme

### Paper IV: System software

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper demonstrates complete concepts to the students about the process generation inside the internal architecture of the systems and helps them to understand how the processing is being done inside the system.	Understand Design	PO3	3	Assignment/ Quiz/ Discussion/
CO2: Detailed insights about the Loader, Linker, Assembler and Compiler are given to the students	Analyse Understand Design	PO4	4	Quiz/ Discussion/seminars
CO3: Study of various phases of the Compiler makes students more enthusiastic to learn about the internal process working of the system so that they can do specialization in the particular course for higher education also.	Analyse	PO4 PO2	3	Assignment/ Quiz/ Discussion/
CO4: Students can compare the concept of macros, multi-threading and multiple process orientation techniques through this course work	Design Apply	PO 4	5	Quiz/ Discussion/seminars

**Semeser:5****Paper I: Computer Networks**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Bloom's</b>	<b>Assessing tools can be used to measure the CO</b>
CO1: Familiar with the different Network Models.	Remember Logic Building	P01	L1/L2	Exam/assignment/seminar/quiz/lab/project
CO2: Understand different network technologies and their application.	Apply/Solving	P02	L2/L3	Exam/Assignment/lab/Mini Project
CO3: Update with different advanced network technologies that can be used to connect different networks	Create/Programs	P03.P04	L4	Exam/Assignment/lab/Mini Project
CO4: Familiar with various hardware and software that can help run a smooth network	Build/	P02, P04	L5/L6	Exam/Assignment/lab/Mini Project/Project

**Paper II: Web Technologies**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Bloom's Level</b>	<b>Assessing Tools can be used to measure CO</b>
CO1: Ability to learn basic and latest scripting languages for web designing	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to apply the scripts for developing websites	Apply	PO2	L3	Exam / Assignment / Seminar
CO3: Ability to understand emerging web technologies	Understand	PO3	L2	Exam / Assignment / / Lab
CO4: Ability to apply emerging technologies in enhancing website development	Apply	PO4	L3	Group discussions / Lab

### Paper III: Operating System

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper demonstrates about the importance of computer system resources and the role of operating system in their management policies to get a better understanding about the concept of various Process Management Techniques under different operating systems available	Remember, understand	PO 1	1,2	Exam/Assignment/Quiz/seminar/viva voce
CO2: The paper gives detailed description about the process and functions of operating system in order to schedule manage and control the processes going inside the system	understand	PO 2	2	Exam/Assignment/Quiz/ viva voce
CO3: The study of operating system helps students to analyse the memory management and its allocation policies which is the prime factor of consideration in every operating system	Analyze	PO 3	4	Exam/Assignment/Quiz/Group discussion/viva voce
CO4: This course helps students to identify use and evaluate the storage management policies with respect to different storage management technologies of operating systems like Windows, Linux and UNIX	Analyze, Apply	PO 4	3,4	Exam/Assignment/Quiz/ viva voce

### Paper IV: Java Programming Language

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Ability to understand the concept the Programming concepts and programming Logic	Remember/Understand	PO1	L1/L2	Exam/Assignment/Quiz/Seminar
CO2: Ability to Understand the concepts of Object Oriented Programming Concepts	Understand	PO 3	L2	Exam/Assignment/Quiz/Group Discussion
CO3: Ability to Apply the concepts of java programming to develop java programs	Apply/Analyze	PO 3	L3/L4	Assignment/Quiz/Practical
CO4: Ability to develop the software using java programming concepts	Investigate	PO4	L5	Lab Assignment

**Semester VI****Paper I: Computer Graphics**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing tools can be used to measure CO</b>
CO1: Ability to understand the concept of computer graphics.	Remember /Understand	PO1	L1/L2	Exam/Assignment/Quiz/Seminar
CO2: Ability to understand the various graphics hardware and software.	Understand	PO 3	L2	Exam/Assignment/Quiz/Group Discussion
CO3: Ability to apply/analyse the various 2D and 3D concepts in developing graphics software.	Apply/Analyse	PO 3	L3/L4	Assignment/Quiz/ Practical
CO4: Ability to Investigate various graphics tools and its working	Investigate	PO4	L5	Lab Assignment

**Paper: II Software Engineering**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing tools can be used to measure CO</b>
Software engineering calls upon interdisciplinary skills like critical thinking, cost analysis & project management—skills that can be enhanced in a master's program in computer science, computer engineering, information's science or software engineering.	Apply	PO 4	4	Exam/Assignment/Quiz/ Practical viva voce
This paper will help students to pursue their career in software engineering with a focus on new technologies and areas of application, such as cyber security, big data, or mobile application development etc.	Understand	PO 2, PO 3	3	Exam/Assignment/Group Discussion
This paper will help students to pursue their career in software engineering with a focus on new technologies and areas of application, such as cyber security, big data, or mobile application development etc	Apply	PO 1	3	Exam/Assignment/Quiz/Practical viva voce/ Group Discussion/ Practical Files/Projects/Seminar

**Paper III: Project**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Bloom's</b>	<b>Assessing Tools can be used to measure CO</b>
CO1: Understanding the requirements for the real world problems and correlating them which will make them able to develop software solutions for database systems.	Understand	PO1	L2	Exam/ assignment/ seminar
CO2: Ability to apply the concepts of software development for a given problem	Apply	PO 2	L3	Exam/ assignment/ seminar/Lab
CO3: Ability to analyse the design and implementation, inculcates the important software developing skills in students to make them a good Software Developer in order to make projects according to the need of customers and companies	Analyse, design, team work	PO3	L4	Exam/ assignment/ seminar/ Lab/Project
CO4: Work in teams and manage the conduct of the research study in near future.	Analyse, design, team work	PO4	L5	Lab/Project
create a software module	Evaluate/create	PO4	L6	Lab/Project

## **Name of Programme: B.Sc. (IT)**

### **Programme Outcomes**

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- PO 2: This programme aware the students about the high use of Computers in various fields and increasing number of Jobs in this field.
- PO 3: This programme make the students well versed with the computing environment and the various concepts, topics and subjects related to this field.
- PO 4: This Programme enables the students to have the complete understanding of various branches of Computer and Technology such as Computer Graphics, Operating Systems and Data Structures.

### **Programme Specific Outcomes**

- PSO 1: This Programme specifically provides better Job Opportunities to the students and professional knowledge in the field of Programming Languages like C, C++ and Java etc.
- PSO 2: This programme will provide the students with complete insight details of the technical subjects of this field like Computer Architecture, Computational Problem Solving using Python, Digital Electronics and Discrete Mathematics. All these technical subjects will help them to grab a Job Opportunity and work in an efficient way in their respective fields.
- PSO 3: The present era of technology is highly demanding the employees with thorough practical training in their required practical approach. This Programme enables the students specifically to solve the real world problems practically and enrich their skills in research and jobs.
- PSO 4: The programme specifically increases the computer depth knowledge in students so that they can pursue their carrier in this field and take subsequent advantages from the programme course work.

### **Semester-I**

#### **Paper I: Fundamentals of Computers**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Accessing Tool can be used to measure CO</b>
CO1: This paper demonstrates fundamental information about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.	Understand	PO1	2	Exam/Assignment
CO2: Students become able to bridge the fundamental concept of computers with their present level of knowledge about computers.	Understand	PO1 PO2	2	Exam/Assignment/Quiz
CO3: This paper includes Microsoft Office programs which is being utilize by students to create professional and academic documents.	Apply	PO2 PO3	3	Exam/Assignment/Quiz/ Practical Implementation

CO4: Students explore various accounting related operations in MS Excel and presentation skills using MS PowerPoint which makes them able to work in field of Office Automation and Desktop Publishing as well.	Apply	PO3	3	Exam/Assignment/Quiz/ Practical Implementation
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**Paper-II: Introduction to Programming- C**

Course Outcome	Skill	PO	Bloom's Level	Assessing Tools can be used to measure CO
CO1: Ability to learn programming skills	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to design algorithms	Apply	PO2	L3	Exam / Assignment / Seminar
CO3: Ability to convert algorithms into code	Apply	PO3	L3	Exam / Assignment // Lab
CO4: Ability to handle possible errors during program execution.	Analyze	PO4	L4	Group discussions / Lab

**Paper III: Applied and Discrete Mathematics**

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper demonstrate the mathematical fundamentals topics to students	Remember, understand	PO 1	1,2	Exam/Assignment/Quiz
CO2: Boolean Algebra is demonstrated through this course structure, so that students can prepare themselves for further understanding of topics related to other subjects of programme.	Understand	PO 1, PO 2	2	Exam/Assignment/Quiz/ viva voce
CO3: This summarize the concepts to the students in many competitive exams that act as a base for reasoning, quantitative techniques and graph theory as well.	Apply	PO 4	3	Exam/Assignment/Quiz/Group discussion/viva voce

**Semester-II**

**Paper III: Principles of Digital Electronics**

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper allows students to analyze the internal circuitry of the processor and memory in detail explaining about process creation, performance of various	Understand, Analyze	PO 1	2,4	Exam/Assignment/Quiz/seminar /viva voce

calculations, number system, number conversions and K-Mapping techniques.				
CO2: It categorize the mathematical foundation going inside the system for the bits transfer inside the processor, converting sum of product forms into product of sum forms, generating the read-write cycles and memory writing timing diagrams	understand	PO 3	2	Exam/Assignment/Quiz/ viva voce
CO3: Digital Electronics makes students summarize about the internal mechanism of Arithmetic Logical Unit inside the processor performing various calculations and manipulations	Understand, Apply	PO 1, PO 3	2,3	Exam/Assignment/Quiz/Group discussion/viva voce
CO4: This paper will motivate students to make their own hardware live projects	Create	PO 4	6	Exam/Assignment/Quiz/ viva voce

#### **Paper IV: Introduction to Programming-C++**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing Tool can be used to measure CO</b>
CO1: This paper illustrates the concepts of C programming language and illustrates the concept of object oriented programming languages so that students can learn about the real time problem solving techniques.	Understand	PO1	2	Exam/Assignment
CO2: Specialized course work can be used for developing different applications, games, animations, web browser, database software, compilers etc., giving students a lot of opportunities in IT Industries as well.	Apply	PO2	3	Exam/Assignment/Quiz/Practical Implementation
CO3: Expansion of this paper is being used in system programming and embedded systems for the establishment of Computer Aided Designs and Computer Aided Manufacturing purposes also.	Understand	PO3 PO4	2	Exam/Assignment/Quiz/Practical Implementation

CO4: This Course rephrase the level of Logical and Analytical Thinking in Students so that they can give more emphasis on real world problem solving techniques and methods.	Apply	PO2 PO3	3	Exam/Assignment/Quiz/Practical Implementation
CO5: C++ inculcates all the required concepts, methodologies and structure oriented guidance in Students which motivates them to be a Good Programmer in future.	Apply	PO3 PO4	3	Exam/Assignment/Quiz/Practical Implementation

### Paper-V: Numerical Methods and Statistical Techniques

Course Outcome	Skill	PO	Bloom's Level	Assessing Tools can be used to measure CO
CO1: Ability to learn different techniques to perform statistical analysis of data, understand error, source of error and its affect on any numerical computation.	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to apply different numerical methods to obtain solution of non linear equations	Apply	PO3	L3	Exam / Assignment / Seminar
CO3: Proficiently and critically use a range of numerical methods for the analysis and solution of engineering problems, including an understanding of alternative approaches and their limitations	Analyze, design	PO4	L4	Exam / Assignment / Seminar/ Lab
CO4: Ability to develop critical and analytic thinking skills to pursue carrier in research and development field.	Analyze, design, team work	PO2	L4	Group discussions / Lab

### Semester-III

#### Paper I: Introduction to Python

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper is specially designed for providing demonstration of programming to students.	Understand, Apply	PO 1	2,3	Exam/Assignment/seminar /viva voce
CO2: Going from the basics to complete detail of the programming concept, this paper enables students to apply their own logics in computer system	Apply	PO 2	3	Exam/Assignment/ Practical/ viva voce

CO3: It is being widely used in various companies and MNCs, therefore this will help students to get survey for their training projects after placements	Analyze	PO 3	4	Exam/Assignment/ Practical
CO4: Students can build up their own software projects by using the syntaxes and semantics of this programme.	Analyze, Create	PO 3	4,6	Exam/Assignment/ Practical /viva voce
CO5: The basic foundation of this particular subject will raise the interest of students in other high level programming languages to accomplish the need of becoming a successful Software Developer	Apply	PO 4	3	Exam/Assignment/Practical

### Paper II: Data Structures

Course Outcome	Skill	PO	Blooms Level	Accessing Tool can be used to measure CO
CO1: This paper determine a technical paper of BSc. IT course after which students can select appropriate data structures to specify problem definition.	Apply	PO1	3	Exam/Assignment
CO2: Students learn about application of various data structure like stacks, queues, tree, graph, linked list etc. related to different operations	Understand	PO2	2	Exam/Assignment/Quiz
CO3: This paper is highly necessary to learn and implement logics in computer science.	Apply	PO1,PO2	3	Exam/Assignment/Practical Implementation
CO4: It also includes the various concepts related to data storage in computers.	Understand	PO3	2	Exam/Assignment/Quiz
CO5: Students prepare criteria to analyze and compare algorithms for efficiency.	Apply	PO4	3	Exam/Assignment/Quiz

**Semester-IV****Paper I: Database Management System**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Bloom's</b>	<b>Assessing Tools can be used to measure CO</b>
CO1: understanding of database systems and its design.	Remember/Understand	PO1	L1/L2	Exam/ assignment/ seminar/ quiz
CO2: Ability to apply the concepts of databases for a given scenario	Apply	PO 2	L3	Exam/ assignment/ seminar/ quiz/Lab
CO3: Ability to analyse the design and implementation of databases	Analyse, design, team work	PO3	L4	Exam/ assignment/ seminar/ quiz/Lab
CO4: Apply database techniques for various applications	Analyse, design, team work	PO4	L5	Lab/assignment

**Paper II: Internet Applications**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing tools can be used to measure CO</b>
CO1: This paper demonstrates various concepts related to Internet where students will learn about the Connection Establishment, configuring the network, trouble shoot the network etc.	Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO2: Students learn about the various measures being used for securing the network along with the help of Internet Protocols and increase in the use various Security Firewalls	Remember	PO 1	1	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO3: Paper illustrates suitable information to students in order to get maximized advantages from the network by implementing an accurate type of Topology and Connecting Computer System in proper Order.	Apply	PO 2	3	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO4: Students can pursue their carrier in the field of Network Security and Network Coordination which is presently in high demand throughout the Industry.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme

### Paper III: JAVA & Web Designing

Course Outcome	Skill	PO	Blooms Level	Assessing Tool can be used to measure CO
CO1: JAVA is the popular for website and Software Development and this course give students a basic core and advanced both types of technical information about JAVA Language.	Understand	PO1	2	Exam/Assignment
CO2: Students get to learn about the basic concepts of object oriented programming and basic as well as advance Java Programming constructs.	Understand	PO1 PO2	2	Exam/Assignment/Quiz
CO3: This programme enables students to implement the constructs and structure of the Java Programming Language in the successful creation of Java Applets and Java Servlets.	Apply	PO3 PO4	3	Exam/Assignment/Quiz/Practical Implementation
CO4: This programme is highly recommended for students in order to pursue career in software development in various MNCs in India and Abroad as well.	Apply	PO2 PO3	3	Exam/Assignment/Quiz
CO5: The Specialization of this will increase the opportunities for students to get jobs in the field of programming, website and software development, software testing etc.	Apply	PO2 PO4	3	Exam/Assignment/Quiz/Practical Implementation

### Paper-IV: Web Technologies

Course Outcome	Skill	PO	Bloom's Level	Assessing Tools can be used to measure CO
CO1: Ability to learn basic and latest scripting languages for web designing	Remember/ Understand	PO1	L1/L2	Exam / Assignment / Seminar
CO2: Ability to apply the scripts for developing websites	Apply	PO2	L3	Exam / Assignment / Seminar
CO3: Ability to understand emerging web technologies	Understand	PO3	L2	Exam / Assignment // Lab
CO4: Ability to apply emerging technologies in enhancing website development	Apply	PO4	L3	Group discussions / Lab

**Semester-V****Paper I: Computer Networks**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing tools can be used to measure CO</b>
CO1: This paper inculcates the complete understanding of networking in students which is the most essential and advantageous in the present scenario of internet and networking.	Understand	PO 1	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme/ project / seminar
CO2: Complete understanding of the specified paper provides students with the information of various network topologies, network protocols, network essentials and network controlling	Understand Apply	PO 3	3	Exam/Assignment/ Quiz/ Discussion
CO3: This Course will help students to get proper information about many network devices and compare their uses so that students can use them in real world also	Remember Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion
CO4: Students will thoroughly elaborate the transmission media and compare different LAN, MAN and WAN topologies.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion
CO5: Studying the detailed information about the internet protocols will increase the ability in students to work in the real networking development techniques	Evaluate	PO 2	5	Exam/Assignment/ Quiz/ Discussion

**Paper II: Operating System**

<b>Course Outcome</b>	<b>Skill</b>	<b>PO</b>	<b>Bloom's</b>	<b>Assessing Tools can be used to measure CO</b>
CO1: understanding the importance of computer system resources and the role of operating system in their management policies, understanding the concept of various Process Management Techniques under different operating systems available	Remember Understand	PO1	L1/L2	Exam/ assignment/ seminar/ quiz
CO2: Ability to apply the process and functions of operating system in to	Apply	PO 2	L3	Exam/ assignment/

schedule, manage and control the processes going inside the system.				seminar/ quiz/Lab
CO3: Ability to analyse the memory management and its allocation policies which is the prime factor of consideration in every operating system,	Analyse, design, team work	PO3	L4	Exam/ assignment/ seminar/ quiz/Lab
CO4: evaluate the storage management policies with respect to different storage management technologies of operating systems	Analyse, design, team work	PO4	L5	Lab/assignment

### Paper III: E-business

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Impart the students with higher level knowledge and understanding of contemporary trends in e-commerce and business finance.	Understand	PO 1	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme/ project / seminar
CO2: To provide adequate knowledge and understanding about E-Com practices to the students.	Understand Apply	PO 3	3	Exam/Assignment/ Quiz/ Discussion
CO3: Learners will be able to recognize features and roles of businessmen, entrepreneur, managers, consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision making.	Remember Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion
CO4: An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion

## Semester-VI

### Paper I : Computer Graphics

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Ability to understand the concept of computer graphics.	Remember/Understand	PO1	L1/L2	Exam/Assignment/Quiz/Seminar
CO2: Ability to understand the various graphics hardware and software.	Understand	PO 3	L2	Exam/Assignment/Quiz/Group Discussion
CO3: Ability to apply/analyse the various 2D and 3D concepts in developing graphics software.	Apply/Analyze	PO 3	L3/L4	Assignment/Quiz/ Practical
CO4: Ability to Investigate various graphics tools and its working	Investigate	PO4	L5	Lab Assignment

### Paper: II Software Engineering

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Software engineering calls upon interdisciplinary skills like critical thinking, cost analysis & project management—skills that can be enhanced in a master's program in computer science, computer engineering, information's science or software engineering.	Apply	PO 4	4	Exam/Assignment/Quiz/ Practical viva voce
CO2: This paper will help students to pursue their career in software engineering with a focus on new technologies and areas of application, such as cyber security, big data, or mobile application development etc.	Understand	PO 2, PO 3	3	Exam/Assignment/Group Discussion
CO3: This paper will help students to pursue their career in software engineering with a focus on new technologies and areas of application, such as cyber security, big data, or mobile application development etc	Apply	PO 1	3	Exam/Assignment/Quiz/Practical viva voce/ Group Discussion/ Practical Files/Projects/Seminar

### Paper III: Project

Course Outcome	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Ability to understand the specific problem under project consideration	Understand	PO2	L2	Exam/Assignment/Quiz/Seminar
CO2: Student will analyse the selected problem for further design.	Analyze	PO 3	L4	Exam/Assignment/Quiz/Group Discussion
CO3: Student will design the front end and backend for the project under consideration	Design	PO 3	L6	Lab Assignment/Group Discussion
CO4: Student will attain the ability to develop/test the software of project under consideration	Apply/Investigate	PO4	L5/L4	Lab Assignment

### Name of Programme: Post Graduate Diploma in Computer Applications

#### Programme Outcomes

- PO 1: This one year programme ensures development of computing and practical skills in students to enhance their introductory knowledge of using the systems efficiently.
- PO 2: The students from various degree programme of other fields can take thorough advantages from this programme and use their computer practical knowledge along with their degree course.
- PO 3: The main objective of this programme is to provide students with basic knowledge of Computer, PC Computing, Data Base Management System and Internet.
- PO 4: This programme will enable the students to work in environment where systems are being highly used and they can use their skills to ensure the better productivity.

#### Programme Specific Outcomes

- PSO 1: This programme specifically prepares the students for this competitive world where computers are playing a vital role and it is necessary for all the employees to have thorough knowledge of computers.
- PSO 2: Along with the basic concepts of Computer, this programme provides students with the practical knowledge of MS- Office, PC Computing, Oracle and HTML also.
- PSO 3: This programme will specifically help the students to grab jobs in IT Sector and make themselves ICT enabled to work in various Organizations, Companies, Banks and MNCs.

## Mapping of Course Outcomes

### Semester-I

#### Paper: I PC-computing 1

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
Co1: Identify the names and functions of the PowerPoint interface.  Create, edit, save, and print presentations.	Apply	PO 2	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO2: Format presentations.  Add a graphic to a presentation.	Apply	PO 3	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO3: Create and manipulate simple slide shows with outlines and notes.  Create slide presentations that include text, graphics, animation, and transitions.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion/ Practical
CO4: Use design layouts and templates for presentations.  Create a PowerPoint presentation.	Evaluate	PO 1	5	Exam/Assignment/ Quiz/ Discussion/ Practical

#### Paper III: Fundamentals of Computer & Operating System

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: To understand the main components of an OS & their Students will able and to describe the important computer system resources and to study the process management and scheduling.	Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO2: To understand various issues in Inter Process Communication (IPC) and the role of OS in IPC	Remember	PO 1	1	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO3: To understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS	Create	PO 2	6	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO4: To study the need for special purpose operating system with the advent of new emerging technologies	Design	PO 2	6	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme

**Paper IV: Database management system through oracle 10g & system analysis & Design**

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper is very significant for the graduate students as it delivers details of database systems and its design	Understand	PO 3	2	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO2: It is having big role in all types of industry/institutions because all kind of necessary data is to be stored in database	Remember	PO 1	1	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO3: This paper also delivers the design and implementation of databases and generates opportunity for students to become data managers, Data base administrators and get jobs in any kind of business house.	Create	PO 2	6	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme
CO4: It provides opportunity for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future.	Design	PO 2	6	Exam/Assignment/ Quiz/ Discussion/ Practical viva voce/ Run the programme

**Semester-II**

**Paper I: Computer Networks**

Course Outcomes	Skill	PO	Bloom's	Assessing tools can be used to measure the CO
CO1: Familiar with the different Network Models.	Remember/Logic Building	P01	L1/L2	Exam/assignment/seminar/quiz/lab/project
CO2: Understand different network technologies and their application.	Apply/Solving	P02	L2/L3	Exam/Assignment/lab/Mini Project
CO3: Update with different advanced network technologies that can be used to connect different networks	Create/Programs	P03,P04	L4	Exam/Assignment/lab/Mini Project
CO4: Familiar with various hardware and software that can help run a smooth network	Build/	P02, P04	L5/L6	Exam/Assignment/lab/Mini Project/Project

### Paper: II Programming in C

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper provides the basic insight of programming skills to the students who are beginning their course work in various Computer Programming Languages.	understand	PO 1	2	Exam/Assignment/Quiz/viva voce
CO2: C Programming acts as the base of Programming Languages which will thoroughly increase the interest of students in Programming Field	Understand, Apply	PO 2 PO 3	2,3	Exam/Quiz/Practical
CO3: All Advanced Computer Programming Languages are belonging to the base concept of C Programming and Learning the basic concept of this course, will help students in Advance Languages also	Understand	PO 4	2	Exam/Assignment/Quiz/Practical
CO4: This Language is being accepted as Universal Programming Language, therefore the concept of this language will inculcate the procedures of Programming Language in Students.	Understand	PO 4	2	Exam/Practical/Quiz/ viva voce
This paper is specifically being used in a multitude of applications, including advanced scientific systems and operating systems	Understand, Apply	PO 2, PO 3	2,3	Exam/Assignment/Practical

### Paper: III Introduction to Scripting Languages Web Designing and Use of Internet

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Ability to understand the concept World wide web and web Designing.	Remember/Understand	PO1	L1/L2	Exam/Assignment/Quiz/Seminar
CO2: Ability to remember and understand the web designing tool and language.	Understand	PO 3	L2	Exam/Assignment/Quiz/Group Discussion
CO3: Ability to Design website	Design	PO 3	L6	Lab assignment /Practical
CO4: Ability to Investigate various web related security issues.	Investigate	PO4	L5	Lab Assignment

**Paper: IV Multimedia Systems**

Description	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper is used to become graphic designers and by having knowledge of this subject, they have the desired skills in Drawing, Layouting, Typography, Lettering, Diagramming and Photography.	Understand	PO 3, PO 2	3	Exam/Assignment/Quiz/ Practical viva voce
CO2: This subject demonstrates how to develop the layout and production design of newspapers, magazines, corporate reports, journals and other publications.	Analyze	PO 4	4	Exam/Assignment/Group Discussion
CO3: Students can also create marketing brochures for services and products, promotional displays packaging, design distinctive logos for businesses and products.	Understand	PO 2	5	Exam/Assignment/Quiz

**Name of Programme: Diploma in Computer Applications****Programme Outcomes**

PO 1: This programme enables the students to have an introductory level of knowledge in computer field so that they can pursue higher studies after higher secondary classes.

PO 2: This one year programme will provide the basic insights of various application software which are being used in various fields, offices and companies.

PO 3: This programme enables the students to understand the basic working of computer systems and learn the basic concepts of system so that they can have basic general knowledge of system.

PO 4: This programme provides beneficial outcomes to the students for preparing for competitive exams and grabs a job in educational and governmental institutions.

**Programme Specific Outcomes**

PSO 1: This programme specifically enables the students to pursue their carrier in computer field and prepare students for effective understanding of the system.

PSO 2: This programme specifically concentrate on the students to increase their computing as well as practical skills in order to make them understand the working of computer and applications of computer in specific fields.

PSO 3: This programme enables the students to inculcate their interest in various application and systems software along with programming skills so that students can take the subject for their further study in order to work in this field.

## Mapping of Course Outcomes

### Semester-I

#### Paper: I Information Technology and Operating System

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: This paper provides fundamental demonstration about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.	Apply	PO 2	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO2: Students become able to bridge the fundamental concept of computers with their present level of knowledge about computers.	Apply	PO 3	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO3: The study of Operating System helps students to analyze the memory management and its allocation policies which is the prime factor of consideration in every Operating System,	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion/ Practical
CO4: This paper helps students to identify use and evaluate the storage management policies with respect to different storage management technologies of Operating Systems like Windows, Linux and UNIX.	Evaluate	PO 1	5	Exam/Assignment/ Quiz/ Discussion/ Practical

#### Paper: II PC-computing 1

Course Outcomes	Skill	PO	Blooms Level	Assessing tools can be used to measure CO
CO1: Identify the names and functions of the PowerPoint interface.Create, edit, save, and print presentations.	Apply	PO 2	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO2: Format presentations.Add a graphic to a presentation.	Apply	PO 3	3	Exam/Assignment/ Quiz/ Discussion/ Practical
CO3: Create and manipulate simple slide shows with outlines and notes.Create slide presentations that include text, graphics, animation, and transitions.	Analyze	PO 2	4	Exam/Assignment/ Quiz/ Discussion/ Practical
CO4: Use design layouts and templates for presentations.Create a PowerPoint presentation.	Evaluate	PO 1	5	Exam/Assignment/ Quiz/ Discussion/ Practical

**Semester-II****Paper I: Database Management System**

<b>Course Outcomes</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing Tool can be used to measure CO</b>
CO1: This paper is very significant for the graduate students as it delivers detail study of database systems and its design.	Understand	PO1	2	Exam/Assignment
CO2: It is having big role in all types of industry/institutions because all kind of necessary data is to be stored in database.	Understand	PO1 PO2	2	Exam/Assignment/Quiz
CO3: This paper also delivers the design and implementation of databases and generates opportunity for students to become data managers, Data base administrators and get jobs in any kind of business house.	Apply	PO2 PO3	3	Exam/Assignment/Quiz
CO4: It provides opportunity for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future.	Understand	PO4	2	Exam/Assignment

**Paper: II PC Computing-I**

<b>Course Outcomes</b>	<b>Skill</b>	<b>PO</b>	<b>Blooms Level</b>	<b>Assessing tools can be used to measure CO</b>
CO1: This paper provides fundamental information about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.	Remember understand	PO 1, PO 2	1,2	Exam/Assignment/seminar /viva voce
CO2: Students become able to bridge the fundamental concept of computers with their present level of knowledge about computers.	understand	PO 2	2	Exam/Assignment/Quiz/ viva voce
CO3: This paper includes Microsoft Office programs which enable the students to create professional and academic documents	Understand Apply	PO 4	2,3	Exam/Assignment/Quiz/Practical /viva voce

<p>CO4: Students also learn about various accounting related operations in MS Excel and presentation skills using MS PowerPoint which makes them able to work in field of Office Automation and Desktop Publishing as well.</p>	<p>Understand Apply</p>	<p>PO 3, PO 4</p>	<p>2,3</p>	<p>Exam/Assignment/Practical /viva voce</p>
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