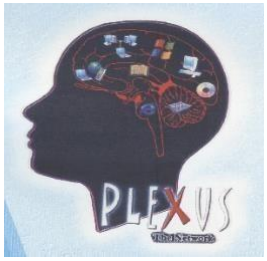
Nallamuthu Gounder Mahalingam College (Autonomous)

Re-Accredited by NAAC & ISO 9001:2015 Certified Institution

Pollachi-642001

Department of BCA



SYLLABUS

(Effective for 2022–2025 Batch and onwards)

Programme Code:	**BCA**			**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**22UBC101**			**Title**	**Batch:**	**2022 - 2025**
				Core - I : Programming In C	**Semester:**	**I**
Lecture Hrs./Week	**5**	**Tutorial Hrs./Sem.**	**5**		**Credits:**	**4**

Course Objective

To provide a student with a thorough grounding in the basics of a Subject and make them to learn the fundamental programming concepts and methodologies which are essential to build good C programs. To develop programming skills in order to meet the day to day IT demands.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Tell the basic terminology used in computer programming	K1
CO2	Understand and debug programs in C language.	K2
CO3	Inference programming concepts such as Arrays, Functions, Structures,	K3
CO4	Analyze the dynamics of memory by the use of pointers and Structures.	K4
CO5	Design different data structures and create/update basic data files.	K5

Mapping

PO\PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	M	M	M	H	H	H
CO2	H	H	M	H	H	H	M	H	M	M	H	H
CO3	H	H	M	H	H	H	M	M	H	H	H	H
CO4	H	H	M	H	H	H	M	M	M	M	H	H
CO5	H	H	M	H	H	H	M	M	M	M	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC102			Title	Batch:	2022 - 2025
				Core II: Data Structures	Semester:	I
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	04

Course Objective

The course is designed for understanding the basic concepts, terminologies in data structures. Toenthuse students knowledge on computer algorithms and able to develop efficient program.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remembering the concepts to use linear and non-linear data structures like stacks, queues , linked list etc.	K1
CO2	Understand and analyze to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures	K2
CO3	Enhance the knowledge to solve problems like sorting, searching, insertion and deletion of data Operations.	K3
CO4	Analyze the concepts of trees, graphs and its applications.	K4
CO5	Evaluate to learn a number of algorithm design techniques and to analyze the efficiency and the accuracy of algorithms.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	M	M	H	L	L	M	H	H	M
CO2	H	H	H	M	H	M	M	L	M	H	H	M
CO3	H	H	H	L	H	H	M	M	M	H	H	H
CO4	H	H	H	H	H	H	M	M	M	H	H	H

CO5	H	H	M	M	H	H	M	M	M	H	H	H

Programme Code:	**BCA**			**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**22UBC1A1**			**Title**	**Batch:**	**2022-2025**
				Allied – I: Mathematics-I: Computer Oriented Numerical and Statistical Methods	**Semester:**	**I**
Lecture Hrs./Week	**4**	**Tutorial Hrs./Sem**	**5**		**Credits:**	**04**

Course Objective

This course provides an introduction to the basic concepts and techniques of numerical solution of algebraic equation, system of algebraic equation, numerical solution of differentiation, integration. It also delivers knowledge of various significant and fundamental concepts to inculcate an adequate understanding of the application of Statistical Methods.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall numerical methods to find out the solution of algebraic equations using different methods like Bisection method, Newton Raphson method under different conditions and numerical solution of system of algebraic equations.	K1
CO2	Understand the properties of Correlation, Regression and compute Karl-Pearson's coefficient of correlation.	K2
CO3	Apply numerical differentiation and Integration whenever and wherever routine methods are not applicable and understand the importance of Interpolation and its application to solve problems for equal intervals and unequal intervals.	K3
CO4	Analyze the system of linear equations by applying different methodologies.	K4

CO5	Compute and interpret the results of Regression and Correlation Analysis.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H		M	H					M	
CO2	H	L			H	M				M	H	M
CO3	H	M	H		H	H				M	H	M
CO4	H	M	H		M	M				M	M	
CO5	H	L			M	M				M	M	

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC103			Title	Batch:	2022 - 2025
				Core Lab -I : Programming In C	Semester:	I
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To practice the fundamental programming methodologies in the C programming language via laboratory experiences. To code, document, test, and implement a well-structured, robust computer program using the C programming language. To prepare students to face the challenges and opportunities in the IT industry by building strong foundations in C programming language.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the C Programming Language.	K1
CO2	Acquire the knowledge about C Programming for various programming technologies.	K2
CO3	Role of constants, variables, identifiers, operators, type conversion and other building blocks of C Language.	K3
CO4	Use of conditional expressions and looping statements to solve problems associated with conditions and repetitions.	K4
CO5	Role of Functions involving the idea of modularity.	K5

Mapping

PO\ PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	H	H	H	H	H	H	H
CO5	H	H	M	H	H	H	H	H	H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC204			Title	Batch:	2022 - 2025
				Core - III : Object Oriented Programming With C++	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	4

Course Objective

To develop a greater understanding of the issues involved in programming language design and implementation. To develop an in-depth understanding of functional, logic and object-oriented programming paradigms. To implement several programs in languages other than the one emphasized in the core curriculum. To understand design/implementation issues involved with variable allocation and binding, control flow, types, subroutines, parameter passing. To train them to meet day-to-day demands of IT industry.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain the basic knowledge on Object Oriented concepts.	K1
CO2	Ability to demonstrate applications using Object Oriented Programming Concepts	K2
CO3	Develop the differences between traditional imperative design and object-oriented Design	K3
CO4	Examine class structures as fundamental, modular building blocks	K4
CO5	Explain the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code.	K5

Mapping

PO\ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	H	H	H	M	H	M	H	H	H
CO2	H	H	M	H	H	H	M	H	H	H	H	H
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	M	L	H	M	H	H	H
CO5	H	H	M	H	H	M	L	H	M	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC205			Title	Batch:	2022-2025
				Core – IV : Digital Computer Fundamentals	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	04

Course Objective

To provide a comprehensive introduction to digital logic design leading to the ability to understand the principles, methods and applications of digital computer organization and design.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember how to represent numbers in computers and use problem solving techniques such as flowcharts.	K1
CO2	Acquire knowledge about Boolean algebra and analyze IC digital logic families.	K2
CO3	Compare various combinational logic circuits.	K3
CO4	Analyze various sequential circuits such as flip – flops, counters and registers.	K4
CO5	Evaluate various components in designing the digital logic circuits.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H		L	M	M		M			M	H
CO2	M	H				H			M		L	M
CO3		H				H	M					
CO4		H				H	M					
CO5	M	M		M	M	H	H	M	H	M	M	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC2A2			Title	Batch:	2022 - 2025
				Allied - II : Mathematics II –Mathematical Foundations Of Computer Applications	Semester:	II
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	5		Credits:	4

Course Objective

Throughout the course, students will be expected to demonstrate their understanding of Discrete Mathematics by being able to use mathematically correct terminology and notation, to construct correct direct and indirect proofs, to use division into cases in a proof, to use counterexamples and to apply logical reasoning to solve a variety of problems.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Ability to define mathematical logic to solve problems.	K1
CO2	Understand sets, relations, functions and discrete structures.	K2
CO3	Able to use logical notations to discover and reason about fundamental mathematical concepts such as sets relations and functions.	K3
CO4	Able to examine problems and solve matrix.	K4
CO5	Able to evaluate and solve real world problems using graphs and probability.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		H	H	H	L	M	M	H	H	H
CO2	M	M		H	H	M		M	M	H	M	H
CO3	M	M		H	H	H		M	M	H	M	H
CO4	M	H		H	H	M		M	M	H	M	H

CO5	M	H	H	H	H	H	L	M	H	H	H	H

22UBC2A2

Programme Code:	**BCA**			**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**22UBC206**			**Title**	**Batch:**	**2022 – 2025**
				Core Lab - II : Programming In C++	**Semester:**	**II**
Practical Hrs./Week	**4**	**Tutorial Hrs./Sem.**			**Credits:**	**2**

Course Objective

To provide in-depth coverage of object oriented programming principles and techniques using C++. Topics include classes, overloading, data abstraction, information hiding, encapsulation, inheritance, polymorphism, file processing, templates, exceptions, container classes, and low-level language features. To develop competent technical writing skills using C++ programming so as to enable the graduate to meet the requirement.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the C++ Programming Language.	K1
CO2	Acquire the knowledge about C++ Programming for various programming technologies.	K2
CO3	Demonstrate the ability to analyze, use, and create functions, classes, to overload operators.	K3
CO4	Demonstrate the ability to understand and use inheritance and Pointers when creating or using classes and create templates.	K4
CO5	Demonstrate the ability to understand and use Exception handling and file handling mechanism.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	M	H	H	H	H	H	H	H	H	H
CO4	H	H	M	H	H	H	H	H	H	H	H	H
CO5	H	H	M	H	H	H	H	H	H	H	H	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC307			Title	Batch:	2022-2025
				Core V: RELATIONAL DATABASE MANAGEMENT SYSTEM AND ORACLE	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem	4		Credits:	4

Course Objective

This course provides a foundation in data management concepts and database systems. It includes representing information with the relational database model, manipulating data with an interactive query language (SQL). This course focus on relational database management systems, including database design theory: E-R modeling, data definition and manipulation languages, database security and administration. It also provides students with theoretical knowledge and practical skills in the use of databases and database management systems in information technology applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic concepts of Database and Database Management System software	K1
CO2	Understand the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.	K2
CO3	Solve Database problems using Oracle SQL and PL/SQL. This will includethe use of Procedures, Functions and Triggers.	K3
CO4	Examine entity relationship and convert entity relationship diagrams in to RDBMS and formulate SQL queries on the data.	K4
CO5	Explain the usage of normalization technique and functional dependency in database design.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			H	H	M		M		H	H
CO2	M	H	M		H	H	M		H		H	H
CO3	H	H	M		H	H	H		M		H	H
CO4	H	M			H	M	M		M		H	H
CO5	H	H	M	M	M		M		L		H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC308			Title	Batch:	2022-2025
				Core VI: OPERATING SYSTEM & LINUX	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	4

Course Objective

To learn concepts relating to structure of operating systems and its functions are including processor scheduling, memory management, and device management. This also covers OS strategies such as concurrency, deadlocks and file system organization. It helps to implement programs in linux environment.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the concept of computer operating systems and its features.	K1
CO2	Understand types and history of operating systems and able to explain modern operating systems and its evolution over the time period.	K2
CO3	Describe how operating systems like Linux and windows will meet the future and real-life needs with respect to efficiency, storage, speed and Security.	K3
CO4	Analyze various operating system functions including memory Management, process management and dead lock prevention strategies.	K4
CO5	Evaluate security, multiprocessing features provided by the Unix operating system using Unix commands, Vi editor and Shell programming.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	H	H	M	M	L	L	M	H	H
CO2	M	H	M	L	L	L	M	M	H	M	M	H
CO3	M	H	M	H	H	H	H	L	H	H	M	H
CO4	H	M	L	L	M	M	M	L	L	L	H	M
CO5	H	H	L	M	H	H	H	L	M	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC3A3			Title	Batch:	2022-2025
				GE III- Allied: Accountancy for Decision Making	Semester:	III
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	04

Course Objective

To enlighten the students on the basics of Accountancy

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Provide the knowledge of accounting theory based on conceptual Framework of accounting.	K1
CO2	Enable students to understand the concept of accounting.	K2
CO3	Impart knowledge accounting in decision making.	K3
CO4	Analyse and interpret accounting related transactions in accordance with Accounting theory.	K4
CO5	Summarize ratio analysis and fund flow statement	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H	H	H	L	H	H	H	H	H	M
CO2	H	H	H	M	H	M	H	H	H	H	H	H
CO3	H	H	H	H	H	H	H	M	H	M	H	H
CO4	H	H	M	H	M	H	H	M	M	H	H	H
CO5	H	M	H	M	H	M	M	M	H	H	H	M

Course Code:	22UBC309			Title	Batch:	2022-2025
				Core LAB – III: Relational Database Management System and Oracle	Semester:	III
Practical Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	2

Course Objective

The major objective of this Lab is to provide a strong formal foundation in database concepts. It demonstrates the use of constraints and various types of SQL functions. It also emphasizes the importance of normalization in database and facilitates the students in Database Design.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember Structured Query Language (SQL) queries using DDL,DML, DCL and TCL commands.	K1
CO2	Understand various queries execution such as relational constraints, joins, set operations, aggregate functions, trigger and views.	K2
CO3	Apply Normalization concepts in a database.	K3
CO4	Analyze the techniques used to design and create Relational Database.	K4
CO5	Evaluate options to make informed decisions that meet data storage, processing and retrieval needs.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		H	H	M	L	M		H	H
CO2	H	M	M		H	H	M		M		H	H
CO3	H	M			H	M	M				M	M
CO4	H	H			H	M	H		H		M	H
CO5	H	H		M	H	H	M	M	H	H	M	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC310			Title	Batch:	2022-2025
				Core Lab- IV: Programming in Linux	Semester:	III
Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To familiarize with the Linux commands, environment, fundamentals of shell scripting and programs on basic linux administration.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply the various commands in terminal to handle UNIX system files.	K1
CO2	Analyze Linux commands using file and system security	K2
CO3	Discuss shell code in VI editors to solve various problems.	K3
CO4	Analyze and Create file systems and directories	K4
CO5	Distinguish various filter and Pipes commands	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	L	L	L	L	M	L	L	H	M	M
CO2	H	M	M	H	M	H	L	L	M	M	H	H
CO3	H	M	H	H	H	H	H	M	H	H	H	H
CO4	H	M	L	H	M	H	L	L	M	L	H	M
CO5	H	M	H	M	L	M	H	M	L	M	H	M

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC3N1			Title	Batch:	2022-2025
				Non Major Elective-I: Web Designing Lab	Semester:	III
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To provide the necessary knowledge of various techniques in web development and will albe able to design a complete website.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the concepts of website Development	K1
CO2	Demonstrate knowledge and skills utilizing various HTML tags for Designing a static webpage.	K2
CO3	Analyze the HTML tags, CSS and JavaScript.	K3
CO4	Recognize and apply the elements of Creating Style Sheet(CSS).	K4
CO5	Develop and incorporate dynamic capabilities in Web page susing JavaScript.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	M	M	H	M		M	H	H	M	M
CO2	M	H		H	M	M	M		M	M	M	M
CO3	M	H		H	H	M		H	M	M	H	M
CO4	M	H		H	M		M	H	H		M	H
CO5	H	H		H	M		M	H	M	M	M	M

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC3N2			Title	Batch:	2022-2025
				Non Major Elective - I : Desktop PublishingLab	Semester:	III
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

The course is designed to provide a deep knowledge in various image processing tools and effects**.**

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic technical and handling tools.	K1
CO2	Understands the various concepts of Photoshop.	K2
CO3	Apply various effects that is suitable to access various formats in this platform for editing.	K3
CO4	Analyze the concepts of different modes in Photoshop.	K4
CO5	Emphasisis placed on desktop concepts desktop applications, learning and working in the desktop environment.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			M	H		M	H		H	M
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	M	H		M	H	H	M	M	H	H	H	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	M	H		M	H	H	M	M	H	H	H	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC411			Title	Batch:	2022-2025
				Core VIII: Visual Programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	03

Course Objective

The course gives introduction to the .Net framework, library and various applications involved in it. It enables the students to learn and develop Windows and Web applications for the .NET platform.

Course Outcomes (CO)

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To understand the concepts of the .NET framework as a whole and the technologies that constitutes the framework.	K1
CO2	Knowledge on ADO.NET with ASP.NET for creating web based data centric applications also understand web services.	K2
CO3	Understand the ASP.NET architecture,web server controls,rich web controls and validation controls,Analyze security management in ASP.NET.	K3
CO4	Use ADO.NET in a web application to read, insert,and update datain a database.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			M	H		M	H		H	M
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	M	H		M	H	H	M	M	H	H	H	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	M	H		M	H	H	M	M	H	H	H	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC412			Title	Batch:	2022-2025
				Core IX: Java Programming	Semester:	IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	03

Course Objective

This course aims to create an environment to understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. It also helps to test Java servlets while developing Java programs which incorporate advanced graphic functions.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the structure and significance of the Java Programming Language.	K1
CO2	Acquire the knowledge about Java Programming Language for various programming technologies.	K2
CO3	Apply the concept of Inheritance and various Java Components.	K3
CO4	Analyze the usage of event handling on AWT and Swing components	K4
CO5	Evaluate the Internet Programming using Java Applets.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M	H		M				M	L	H	M
CO2	H	H	H		H	H	M	H	H	H	H	M
CO3	H	H	L			M			H	H	H	H
CO4	H	H	L			M			H	H	H	H
CO5	H	H	L	H		H	H	H	H	H	H	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC4A4			Title	Batch:	2022-2025
				Allied: IV Mathematics III- Computer Based Optimization Techniques	Semester:	IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	3

Course Objective

The course provide with the basics of various optimization techniques, the key concepts of linear programming, Transportation, Assignment problem, PERT & CPM. It also offers various mathematical applications in industries and Decision making for realtime environment.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the modeling and computational tools as well as analytic skills to evaluate the problems.	K1
CO2	Understand and explain the various mathematical formulations.	K2
CO3	Apply Working with Non Linear programming Problems.	K3
CO4	Analyze Linear Programming problem and similar such problems into appropriate forms and problem solving.	K4
CO5	Estimate the problem situation for better decisions.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		H	M			M	H	M	H	M
CO2	M	M		H	H				H	M	M	H
CO3	M	H		H	H	M		M	M		M	M
CO4	M	H		H	H	M		M		M	M	H
CO5	M	H	M	H	H	M		M	M		M	H

High; M-Medium; L-Low

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
Course Code:	22UBC413			Title	Batch:	2022-2025
				Core Lab V: visual programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem			Credits:	02

Course Objective

To develop the practical aspects of application using fundamentals of ASP.Net and C#.

To gain the knowledge of Web server controls, Form validation, Session handling, Error handling, Inheritance, File operations and ADO.Net connectivity.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the ASP.Net applications using standard .net controls	K1
CO2	Understand the decision making statements and user interfacing controls	K2
CO3	Implement and deploy database connection management using ADO.NET	K3
CO4	Analyze simple data binding applications using ADO.Net Connectivity	K4
CO5	Evaluate web-based applications by using various web controlsin ASP.NET.	K5

Mapping

PO/ PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1		H		M	M	M	M	M	M	H	H	M
CO2	M	M			H	H	M	H	M	H	H	M
CO3		H		M	H	M	H	M		H	H	H
CO4	M	M		H	M	M	M	H	M	M	M	H
CO5	M	H		H	H	H	M	H	H	H	H	H

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
CourseCode:	22UBC414			Title	Batch:	2022-2025
				Core Lab VI: Java Programming	Semester:	IV
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To provide students with the ability to write programs in Java and Advanced Javaby applying concepts described in the Object-Oriented Programming course and develop their programming career.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall the concepts of Object-Oriented Programming.	K1
CO2	Understands the concepts of Multithreading and Method Overriding.	K2
CO3	Apply the concept of Applets and Servlets.	K3
CO4	Analyze the concepts of JMenu, JTabbed Pane and JTree.	K4
CO5	Evaluate the usage of Generic Servlet and HTTP Servlet.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		M	M					M	H
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	H	H	L		M	M		H	H	H	M	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	H	H		H	H	M	M		M	M	H	M

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
CourseCode:	22UBC4S1			Title	Batch:	2022-2025
				SEC II: Naan Mudhalvan: Cloud Computing	Semester:	IV
Practical Hrs./Week	2	Tutorial Hrs./Sem.			Credits:	2

Course Objective

To provide students with the fundamentals and essentials of Cloud Computing. To provide students a sound foundation of the Cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the Concepts of Cloud computing	K1
CO2	Understand the Cloud computing fundamentals.	K2
CO3	Apply the fundamental concepts in datacenters to understand the trade offs in power, efficiency and cost.	K3
CO4	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.	K4
CO5	Analyze various cloud programming models and apply them to solve problems on the cloud.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H		H	M		M	H	H		M	H
CO2	H	H		H	M	M	M	M	M	H	M	H
CO3	H	H		H	M		M	H	M	M	M	M
CO4	H	M		M	M	M	M	H	M	H	M	H
CO5	M	H		H	H	M		H	M	M	H	M

Programme Code:	BCA			ProgrammeTitle:	Bachelor of Computer Applications	
CourseCode:	22UBC4S2			Title	Batch:	2022-2025
				SEC II: Naan Mudhalvan: DevOps Foundation	Semester:	IV
Practical Hrs./Week	2	TutorialHrs./Sem.			Credits:	2

Course Objective

Provides the foundations of knowledge, principles and practices from a technical perspective needed to engineer a successful DevOps solution.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	COStatement	Knowledge Level
CO1	Recollect the Concepts of DevOps Foundation	K1
CO2	Understand the DevOps Foundation fundamentals.	K2
CO3	Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.	K3
CO4	Identify resource management fundamentals	K4
CO5	Analyze various cloud programming models and apply them to solve problems on the DevOps	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H		H	M		M	H	H		M	H
CO2	H	H		H	M	M	M	M	M	H	M	H
CO3	H	H		H	M		M	H	M	M	M	M
CO4	H	M		M	M	M	M	H	M	H	M	H
CO5	M	H		H	H	M		H	M	M	H	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4N1			Title	Batch:	2022-2025
				Non Major Elective-II: Photo EffectsLab	Semester:	IV
Practical Hrs./Week	1	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To learn the various photo editing features and animation techniques and demonstrate proficiency in developing the multimedia presentations.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basic elements and principles of photo editing software to Achieve a great photo effect by applying effects.	K1
CO2	Understand the important aspects of Adobe Photoshop Elements.	K2
CO3	Construct simple documents utilizing selections, layers and blending modes.	K3
CO4	Analyze color management and correction techniques inAdobe Photoshop.	K4
CO5	Evaluate simple shapes using animation editing software and design Simple animation by applying shape tweens and motion tweens.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H			H			M		H	H	H
CO2	H	H	M		H	H	H	H	M	H	H	H
CO3	H	M		M	H	H		H	M	H	H	M
CO4	H	H	H			H	H			H	H	H
CO5	H	H	H			H	H			H	H	H

Programme Code:	BCA	Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC4N2	Title	Batch:	2022-2025
		Non Major Elective–II: Animation Lab	Semester:	IV
Practical Hrs./Week	Tutorial Hrs./Sem.		Credits:	02

Course Objective

To learn the concepts Multimedia and Compression Techniques through Graphic design.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect animation software and make them to design animated Applications.	K1
CO2	Understand the gradients and patterns using available tools.	K2
CO3	Apply the concept of timeline animation.	K3
CO4	Analyze innovative character and applying effects with aid of software.	K4
CO5	Evaluate import text, character, paragraph formatting and effects to text.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			H		M	M	H	H	H	M
CO2	M	M		M			M		M	H	M	H
CO3	L	H		H	H	M	M	M	H	H	H	H
CO4	M	H		M	H	H	M	M	H	M	M	M
CO5	M	M		M	M	M	M	M	M	M	H	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC519			Title	Batch:	2022-2025
				Core - XI : Python Programming	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem	5		Credits:	04

Course Objective

The course is designed to covers the Basic knowledge of Python Programming. It is intended for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the fundamental concept of python programming.	K1
CO2	Understand the control flow, Operators and looping statements	K2
CO3	Applying and developing programs using Functions &modular programming.	K3
CO4	Analyze the Errors handling Mechanisms while working with Exception	K4
CO5	Evaluate object oriented features and organize files.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M		M	M	H			M	M	H	M
CO2	M	M		M	H	M	M		H	M	H	M
CO3	H	H	M		H	H			H	H	H	H
CO4	H	H	M	M		H	M		H	H	H	H
CO5	H	H				H	H		H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC520			Title	Batch:	2022-2025
				Core - XII :Skill Enhanced Course Software Testing	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	04

Course Objective

The course is to expose the students to different software testing tools and techniques, to plan and create test plan and manage test cases. To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects using automation tool.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the fundamental concepts and types in software testing.	K1
CO2	Understand the process of applying tests to software and the basic components of a test case.	K2
CO3	Apply a test plan by learning its process and components.	K3
CO4	Analyze the automation techniques and use modern testing tools to support software testing projects.	K4
CO5	Evaluate the test code and automate test execution.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	H			M	H	H	M
CO2	H	H		M	H	H	M		H	H	H	H
CO3	H	H	M	M	H	H	H	M	H	H	H	H
CO4	M	M	M		M	M				H	M	M
CO5	H	H		M	H	H	H		H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E1			Title	Batch:	2022 - 2025
				Core Elective – I: Networks	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem.			Credits:	04

Course Objective

To provide a strong background of computer network concepts, a good foundation covering the layers of OSI and TCP/IP model to acquire knowledge and network functionalities into layers.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember computer network basics, network architecture, and TCP/IP and OSI reference models.	K1
CO2	Understand the knowledge about essential protocols and their operations.	K2
CO3	Apply aspects of network security.	K3
CO4	Familiarize the different types of protocols.	K4
CO5	Evaluate detection and correction of errors in transmission.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M		H	H	M	H		H	H	H	H
CO2	M	M	M	M	H		H		H		H	M
CO3	H	H	M	H	M	M	H		H	H	H	H
CO4	M	M		M	M			M	M		M	M
CO5	M	H	M	M	M	H	L		M	M	M	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E2			Title	Batch:	2022-2025
				Core Elective - I : Organizational Behaviour	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	03

Course Objective

This course aims in developing the knowledge in personality, perception, attitudes and motivation and learning about stress management, communication, leadership, organization structure and organization culture and helps to apply the obtained knowledge in their career development.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the Individual Behaviour and its effects in an organization.	K1
CO2	Acquire the knowledge about Personality, Perception, Attitudes and Values.	K2
CO3	Apply Learning and Motivation concepts in an Organization.	K3
CO4	Analyze the various types of Organizational Culture and Organizational Structure.	K4
CO5	Interpret the various types of leadership and the effects of adaptation to it.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1		H		L	M	M			M	M	M	M
CO2	M	H		M	H	H			H	L	H	H
CO3	M	H	M	H	H	H	M	M	H	M	H	H
CO4		H			H	H			M	M	H	H
CO5	L	M			H	H	M	M	H	M	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5E3			Title	Batch:	2022-2025
				Core Elective –I : Data Science	Semester:	V
Lecture Hrs./Week	6	Tutorial Hrs./Sem			Credits:	04

Course Objective

To develop the student's knowledge in the basic concepts of Python, Machine Learning and Deep Learning.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the fundamentals of Python and R-Programming.	K1
CO2	Understand the basic concepts of Data Wrangling and the process of data flow.	K2
CO3	Apply the basic concepts in Natural Language Processing and Neural Networks.	K3
CO4	Analyze the concept of Machine Learning and Deep Learning.	K4
CO5	Evaluate ML Algorithms and gain knowledge on Outliers.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M				H	H					H	H
CO2					H	M		M	H	H	H	H
CO3		H	M			H	H	M	H	H	H	H
CO4				H	H	H	H		H	H	H	H
CO5	M	H		H	H	H				H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC521			Title	Batch:	2022-2025
				Core Lab - IX : Python Programming	Semester:	VI
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

The course presents an overview of elementary data items, list, dictionaries and oops concepts.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the syntax of the Python language	K1
CO2	Understanding the control statements, loops and functions	K2
CO3	Identify the external modules for creating and writing data to excel files and inspect the file Operations to navigate the file systems.	K3
CO4	Analyze the techniques used to design and create Python.	K4
CO5	Interpret the concepts of Object-oriented programming as used in Python using encapsulation, polymorphism and inheritance	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	H	M		M	M					M	H
CO2	H	H	M	H	M	M	M	M	H	H	M	H
CO3	H	H			M	M		H	H	H	H	H
CO4	H	H	M	M						M	M	H
CO5	H	H		H	M	M		H	H		H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC522			Title	Batch:	2022-2025
				Core Lab - X : Software Testing	Semester:	V
Practical Hrs./Week	4	Tutorial Hrs./Sem			Credits:	02

Course Objective

The course has been designed to provide knowledge on how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, and generate a testing report.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Recollect the essential characteristics of tools used for test automation.	K1
CO2	Understands the Automation testing approach and to write test suites for software	K2
CO3	Develop analyzing techniques through automation testing tool	K3
CO4	Generate test cases from software requirements using various test processes for continuous quality improvement	K4
CO5	Evaluate the automation process in software testing.	K5

Mapping

PO/ PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1		H	M	M	H	H	H	H	M	H	H	H
CO2	H	M			H	M		H	H	H	M	H
CO3		H	M	M	H	H		H	H	H	H	H
CO4	H	H	M	M	M	M	M	H	M	M	H	H
CO5	M	M	M	M	H	H	H	M	H	M	M	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC523			Title	Batch:	2022 -2025
				Mini Project	Semester:	V
Lecture Hrs./ Week or Practical Hrs./Week		Tutorial Hrs./Sem.			Credits:	3

BACHELOR OF COMPUTER APPLICATIONS
PROJECT and VIVAVOCE

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of fifth Semester. Each student will be assigned with a Faculty for guidance. The Project work and coding will be carried by using the facility of computer science lab as well as in the organization. Periodical review will be conducted to monitor the progress of the project work. Project report will be prepared and submitted at the end of the semester. External examiner appointed by the Controller of Examination will conduct the viva voce examination along with respective guide.

Area of Work

- Web Based Development
- Mobile app development
- Website development
- IOT Projects
- Big Data and Data Mining Projects
- Cloud Computing Projects
- Networking Projects
- Artificial Intelligence and Machine learning Projects
- Data Analytics Projects using Python, R, Tableau etc..
- System Software
- Web Security Projects
- Image Processing

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5AL			Title	Batch:	2022-2025
				Advanced Learner Course – I: Adhoc And Sensor Networks - Self Study	Semester:	V
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	05*

Course Objective

To study the protocols and the functionalities of ad hoc networks, understanding the various applications developed based on ad hoc networking, addressing issues and challenges created. To know about the sensor networks and addressing the challenges in establishing infrastructure for sensor networks and managing database.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Understand the Fundamental Concepts and applications of ad hoc and wireless sensor networks	**K1**
CO2	Demonstrate the MAC protocol issues of ad hoc networks	**K2**
CO3	Apply the concepts of network architecture and MAC layer protocol for WSN	**K3**
CO4	Analyze the routing protocols for ad hoc wireless networks with respect to TCP design issues	**K4**
CO5	Explain the WSN routing issues by considering QoS measurements	**K5**

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		H	H	H	H	H		H	H	H
CO2				M		M		H			M	M
CO3	H	H		H	H	H	H	M	H	H	H	H
CO4				M			M	H	M	H	H	H
CO5	M			M	H	H	M				M	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5VA			Title	Batch:	2022-2025
				Pc Assembly and Maintenance	Semester:	V
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	2*

Course Objective

This course will enable the students to understand the fundamentals of Computer and enabling them to assemble troubleshoot and installation of hardware, software & peripherals devices of Computer.

Course Outcomes (CO)

K1	CO1	To Demonstrate knowledge & Concepts of Computer Fundamentals.
K2	CO2	To know the Installation of Operating System and preventive maintenance.
K3	CO3	To know how to Perform a step by step assembly of a computer.

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		M		M		L	M	H	H	H
CO2	H	H	H	H	H	M	M	L	M	M	H	H
CO3	H	H		M	H	M	M	H	H	M	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5S1			Title	Batch:	2022-2025
				Skill Based Elective - I : Mobile Phone Services	Semester:	V
Lecture Hrs./Week	3	Tutorial Hrs./Sem			Credits:	03

Course Objective

The course has been designed to provide knowledge on Mobile Repair configuration, assembly, testing and Maintenance.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Remember the basics of mobile communication, parts inside a mobile phone.	K1
CO2	Understand the application and software compatibility with the Mobile Phone technologies.	K2
CO3	Apply appropriate tools and manuals for repairing the specific issues.	K3
CO4	Analyze Repair and Diagnose Problem of all kinds of faults in Mobile Phone in Hardware as well Software.	K4
CO5	Explain about Fault finding, troubleshooting and repairing of various faults.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H		M		M		L	M		H	H
CO2		M				M	M	L	M	M	H	H
CO3	H	H		M	H	M	M	H	H	M	M	M
CO4		M			M	M			H	H	H	H
CO5	H			H		H			M		H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5S2			Title	Batch:	2022 – 2025
				Skill Based Elective - I : Internet Of Things	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./Sem.			Credits:	03

Course Objective

To understand the fundamentals of Internet of Things and its protocols. They also understand how to acquire sensor data, make available on the Internet and visualize sensor data and will be able to build simple low-cost embedded systems using Raspberry Pi to apply the concept of IOT in the real-world applications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	Co Statement	Knowledge Level
CO1	Learn the concept and significance of IOT and its services.	K1
CO2	Understand the different IOT Technologies like Micro-controller,Wireless communication like Blue Tooth, GPRS, Wi-Fi andStorage and embedded systems.	K2
CO3	Deploy and test different protocols and prototypes in IOT.	K3
CO4	To create programs using Arduino IDE and extract data	K4
CO5	Experiment IOT systems and test its connection to the cloud computing, big data and machine learning disciplines.	K5

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	M		L		M	M	M
CO2	M	H	H	M	H	H	H		H	M	H	M

CO3	M	M	M	H		H	H		H	M	H	H
CO4		M	H		H	H		M	H	H	H	H
CO5	M	M	H	H	H	H	H	M	H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC5S3			Title	Batch:	2022-2025
				Skill Based Elective - I :Desktop Publishing Lab	Semester:	V
Practical Hrs./Week	3	Tutorial Hrs./Sem.			Credits:	03

Course Objective

The course is designed to provide a deep knowledge in various image processing tools and Effects

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	KnowledgeLevel
CO1	Remember the basic technical and handling tools.	K1
CO2	Understands the various concepts of Photoshop.	K2
CO3	Apply various effects that is suitable to access various formats in this platform for editing.	K3
CO4	Analyze the concepts of different modes in Photoshop.	K4
CO5	Emphasis is placed on desktop concepts desktop applications, learning andworking in the desktop environment.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H			M	H		M	H		H	M
CO2	H	M	M	M	H	M	M		L	M	H	H
CO3	M	H		M	H	H	M	M	H	H	H	H
CO4	H	H		H	M	M	M	H	H	H	H	H
CO5	M	H		M	H	H	M	M	H	H	H	H

Programme Code:	**BCA**			**Programme Title:**	**Bachelor of Computer Applications**	
Course Code:	**22UBC624**			**Title**	**Batch:**	**2022 - 2025**
				Core XIII: PHP Programming	**Semester:**	**VI**
Lecture Hrs./Week or Practical Hrs./Week	**4**	**Tutorial Hrs./Sem.**	**5**		**Credits:**	**04**

Course Objective

To learn concepts relating to PHP and its scripting including functions, form handling and database management. This course also covers MySQL as a backend database system includes table creation and data backups. It helps to create effective and dynamic websites.

Course Outcomes

On the successful completion of the course, students will be able to,

CO Number	CO Statement	Knowledge Level
CO1	Remember the concept of PHP and its syntax and scripts.	K1
CO2	Understand frameworks, functions and objects to implement dynamic websites.	K2
CO3	Apply dynamic, client server programming and database management concepts to generate complex queries.	K3
CO4	Analyze various database queries to learn how to combine PHP and MySQL to experiment web pages by integrating forms and other features.	K4
CO5	Evaluate security, scripting features provided by the PHP to maintain high level of data protection.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	M	H	M	L			M	M	H
CO2	H	H	M		M		M	M	H	M	M	M
CO3	M	H	M	H	H	M	H		H	H	H	H
CO4	H		H		M	M	M	H	M	M	H	M
CO5	H	M		M	H	H	H	L	M	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC625			Title	Batch:	2022-2025
				Core - XIV : Mobile Application Development	Semester:	VI
Lecture Hrs./Week	4	Tutorial Hrs./Sem			Credits:	04

Course Objective

To provide a practical approach for Android mobile application development and theoretical knowledge about windows application.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the history of Android development and what is required tobuild Android apps.	K1
CO2	Understanding Android application architecture, including the roles of thetask stack, activities, and services.	K2
CO3	Utilize rapid prototyping techniques to design and develop sophisticatedmobile interfaces.	K3
CO4	Analyze the implementation of messaging and location-based services.	K4
CO5	Evaluate developed app and publish in market.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	H	M		M	H			H	H	H	M	M
CO2	H	H			H	M	H	H		H	H	M
CO3	H	M			M		M	H		H	H	H
CO4	M	M		H	H	M	M	H		M	M	H
CO5	M	M	M	M	H		M	M	M	H	H	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E4			Title	Batch:	2022-2025
				Core Elective II: Storage Management	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	05

Course Objective

The main objective of the course is to understand the fundamental storage system architectures and storage performance management.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remembering the storage architectures, storage subsystems and variety of storage system environments.	K1
CO2	Understanding different RAID levels and their suitability on different Application environments.	K2
CO3	Apply the file sharing operations and protocols on Network Attached Storage (NAS).	K3
CO4	Analyze the characteristics and components of SAN	K4
CO5	Evaluate the different backup and recovery topologies	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	M	L	L	M	M	H	L	M		H	M
CO2	H	M	M	H	M	H	M	M		M	H	H
CO3	M	M	M	L	H	L	L	M	M		H	M
CO4	H	M	M	M	H	M	M	H	M	H	H	H
CO5	H	M	L	M	H	H	H	L	M	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E5			Title	Batch:	2022-2025
				Core Elective II : Current Trends and Technologies	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	05

Course Objective

The main objective of the course is to study and apply IT applications with a wide range of concepts and technical skills in the areas to succeed in the future.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the latest trends in technology	K1
CO2	Understand the Objectives and Guidance of Cyber security.	K2
CO3	Apply the knowledge of big data and its analytical technologies	K3
CO4	Analyze the concepts Cyber Security Policy and Security Evolution.	K4
CO5	Implement the Data and Knowledge Management and use of Devices in IOT Technology.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	PSO1	PSO2
CO1	M	H	L	M	H	M	M	L	H	M	H	M
CO2	M	H	M	M	H	H	M	L	H	M	H	H
CO3	H	H	L	H	H	H	H	M	H	L	H	H
CO4	M	H	M	H	H	H	H	L	H	H	H	H
CO5	H	H	M	H	H	H	H	M	H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E6			Title	Batch:	2022-2025
					Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.		Core Elective II : Information Security	Credits:	05

Course Objective

To prepare students with the technical knowledge and skills needed to protect and defend computer systems and networks. To develop graduates that can plan, implement, and monitor cyber security mechanisms to help ensure the protection of information technology assets. To develop graduates that can identify, analyze, and remediate computer security breaches.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the fundamental concepts of Information Security.	K1
CO2	Understand the concepts of public key encryption, Authentication and hashfunctions.	K2
CO3	Examine the issues in Network Security and Intrusion Detection andDefensive Programming.	K3
CO4	Analyze the basic understanding of cryptography, how it has evolved, andsome key encryption techniques used today.	K4
CO5	Evaluate the security features and Cyber security law in real life situations.	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	M	H	H	M		L		M	L	H	H
CO2	M	M	M	H	H	H	M		M	M	H	H
CO3			H		H	M	H		H	H	M	M
CO4		H	M	M	M	H	M	H	M	M	M	H
CO5	H	H	H	H	M	M	H	H		H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E7			Title	Batch:	2022 - 2025
				Core Elective - III : Data Mining And Warehousing	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	05

Course Objective

To learn the basic concepts, applications and techniques of data mining and to develop skills for applying data mining techniques and algorithms to solve practical problems in data and information management, retrieval and knowledge discovery in various disciplines.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall the concept of data mining, warehousing and knowledge discovery process.	K1
CO2	Understand data pre-processing techniques like cleaning, integration and data transformation strategies.	K2
CO3	Describe the knowledge discovery process and its algorithms including k-nearest neighbour, decision trees, association rules and neural networks.	K3
CO4	Analyze the data modeling, design and implementation of warehousing solutions for emerging internet and cloud environments.	K4
CO5	Evaluate KDD environment by visualizing the reports using various analysis and query tools.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	L	L	H	M	L	M	H	M	H	H
CO2	M	H	L	L	M	H	H	L	H	L	M	M
CO3	H	M	H	L	H	H	L	L	M	M	H	M
CO4	M	L	H	H	M	M	H	L	H	M	H	H
CO5	M	H	L	L	M	H	L	M	M	M	M	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E8			Title	Batch:	2022 - 2025
				Core Elective-III: Cloud Computing	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	05

Course Objective

This course provides with the basics of Cloud Computing, the key concepts of Virtualization and different Cloud Computing services. It also offers students a sound foundation of the Cloud environment so that they are able to start using and adopting Cloud services in their real life scenarios.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.	K1
CO2	Demonstrate the fundamental concepts of cloud storage and their use in storage systems such as Amazon S3 (Simple Storage Service) and Microsoft Azure.	K2
CO3	Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost.	K3
CO4	Analyze the performance of Cloud Computing.	K4
CO5	Explain the core issues of Cloud Computing such as security, privacy, and interoperability.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1		H		H	M	H	H		H		H	H
CO2		H		H	M	H	H		H		H	H
CO3		M		H	M	H	H		H		H	H
CO4		H		H	H	H	H		H		H	H
CO5		M		H	M	M	M		H		H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6E9			Title	Batch:	2022-2025
				Core Elective - III : Nano Computing	Semester:	VI
Lecture Hrs./Week	5	Tutorial Hrs./Sem			Credits:	05

Course Objective

This course is intended to provide the students with the prospects, challenges, imperfections, reliability and with insight into Nanoscale Quantum Computing and QCA implementation.

Course Outcomes

Upon completion of this course students shall be able to

CO Number	Co Statement	Knowledge Level
CO1	Remember the concepts of Nano computing	K1
CO2	Understand Nano computing challenges and imperfections	K2
CO3	Apply reliability evaluation strategies	K3
CO4	Analyze nano scale quantum computing	K4
CO5	Explain the concept of Molecular Computing and Optimal Computing	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		H	H	H	H	H		H	H	H
CO2	M	M		M	M	M		H			M	M
CO3	H	H		H		M	H	M	H	H	H	H
CO4	M	M		M	M	M	M	H	M	H	H	H
CO5	M	M		M	H	H	M				M	M

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC626			Title	Batch:	2022 - 2025
				Core Lab - XI : PHP Programming	Semester:	VI
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To measure the student's knowledge about the PHP script languages and to demonstrate how tostore and retrieve data from the database and also helps the students to setup a better career.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	Co Statement	Knowledge Level
CO1	Recall the fundamentals of PHP Script.	K1
CO2	Understand the concept of loops in PHP.	K2
CO3	Apply the concept of Functions and Arrays in PHP.	K3
CO4	Analyze the usage of Database in PHP.	K4
CO5	Evaluate the PHP and WAMP Server Connectivity.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	H	L		M	M	L			M	H	M
CO2	H	M	M	H	H	H			M	M	H	M
CO3	H	H	M		H	M	L	M		M	H	M
CO4	L	H	H	M	M	M	M		M	M	H	M
CO5	M	L	M	M	M	H	H		H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC627			Title	Batch:	2022 - 2025
				Core Lab - XII : Mobile Application Development	Semester:	VI
Practical Hrs./Week	4	Tutorial Hrs./Sem.			Credits:	02

Course Objective

To design and implement various mobile applications and learn how to deploy applications to hand-held devices.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember essential Android Programming concepts.	K1
CO2	Understand various Android Applications related to layouts and rich uses interactive interfaces.	K2
CO3	Apply native application using GUI components and Mobile application development framework.	K3
CO4	Analyze Android applications to the app market.	K4
CO5	Evaluate mobile applications for the current scenario.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M		M	H	H	M	H	M	H	H	H
CO2	M	H	M	H	H	M		H	M		H	M
CO3	M	M		M	H	M		H	M		M	M
CO4	H	H	M	M	H	M		M	H	H	H	H
CO5	H	M		H	M	H	M	H	M	M	M	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6AL			Title	Batch:	2022-2025
				Advanced Learner Course – II: Disaster Management	Semester:	VI
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	4*

Course Objective

This course provides with the basics of disasters, their significance and types. To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Remember the types of disasters, causes and their impact on environment and society.	K1
CO2	Understand the knowledge about approaches of Disaster Risk Reduction (DRR)	K2
CO3	Apply emergency planning into overall community planning.	K3
CO4	Analyze the vulnerability and various methods of risk reduction measures as well as mitigation.	K4
CO5	Explain the hazard and vulnerability profile of India, scenarios in the Indian context, Disaster damage assessment and management.	K5

Mapping

PO /PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	H			M	H	H	M
CO2	H	H		M	H	H	M		H	H	H	H
CO3	H	H	M	M	H	H	H	M	H	H	H	H
CO4	M	M	M		M	M				H	M	M
CO5	H	M		M	H	H	H		H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6VA			Title	Batch:	2022-2025
				Hardware Troubleshooting and Network Essentials	Semester:	V
Lecture Hrs./Week		Tutorial Hrs./Sem			Credits:	2*

Course Objective

At the end of the program the students will be able to understand the basics of assembling a computer & installing OS.

Course Outcomes (CO)

K1	CO1	To Demonstrate knowledge & Concepts of Computer Fundamentals.
K2	CO2	To know the Installation of Operating System and preventive maintenance.
K3	CO3	To know how to Perform a step by step assembly of a computer.

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M		H	H			M	H	H	M
CO2	H			M	H	H	M		H	H	H	H
CO3	H	H	M	M	H	H		M	H	H		H
CO4	M	M	M		M	M				H	M	M
CO5	H	M		M	H	H	H		H	H	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6S4			Title	Batch:	2022-2025
				Skill Based Elective - II : Corporate Systems	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./Sem			Credits:	03

Course Objective

To develop the students' knowledge in various industries such as healthcare systems, banking, insurance, textiles and telecommunications.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the usage of computers in Healthcare systems.	K1
CO2	Disseminate knowledge and can inculcate the theoretical structures about banking and insurance	K2
CO3	Apply IT in Telecommunication and over internet.	K3
CO4	Gain practical understanding of different textile materials (Fiber, yarn, fabric).	K4
CO5	Evaluate the efficiency of various energy utilities.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H		H	H	H	M		H	M	H	H
CO2	H	H		M		H	M				H	H
CO3	H	H		H	H	H	M	H	H	H	H	H
CO4	M	H				H	M		H			
CO5	H	H				H						

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6S5			Title	Batch:	2022-2025
				Skill Based Elective - II : Multimedia and Animation	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./Sem			Credits:	03

Course Objective

To learn the basic elements in basic of drawing, color and implement in the multimedia software and to apply the techniques to design real time pictures.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the effects of multimedia in daily life.	K1
CO2	Gain knowledge about digital image processing tools and software	K2
CO3	Apply the concept of various file formats of audio, video and text media.	K3
CO4	Analyze the techniques in animation.	K4
CO5	Evaluate projects and presentations utilizing a variety of digital media multimedia technologies for its optimum performance.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1		H				M		H	H			H
CO2	M	H		M	H	H	M	H	H	M	H	H
CO3		H						H	H		M	H
CO4		H		M		M		H	H		H	H
CO5	M	H			H	H	M	H	H	M	H	H

Programme Code:	BCA			Programme Title:	Bachelor of Computer Applications	
Course Code:	22UBC6S6			Title	Batch:	2022-2025
				Skill Based Elective - II : Personality Development Skills	Semester:	VI
Lecture Hrs./Week	3	Tutorial Hrs./Sem			Credits:	03

Course Objective

To develop the student broad career plans, evaluate the employment market, identify the organizations to get good placement, match the job requirements and skill sets.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the communication and interpersonal skills.	K1
CO2	Understands the tasks and resolve conflicts in the management.	K2
CO3	Apply the concept of listening skills.	K3
CO4	Analyze the employability skills.	K4
CO5	Evaluate the time and resource management, conflict resolution, teaching and mentoring others.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1					H					H	M	H
CO2					H	M				H		H
CO3					H				M	H		H
CO4	M	M			H	M	M	H	H	H	H	H
CO5		M			H			M	M	H	M	H

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