ALAGAPPA UNIVERSITY, KARAIKUDI
SYLLABUS UNDER CBCS PATTERN FOR AFFILIATED COLLEGES WITH EFFECT FROM THE ACADEMIC YEAR 2022-23 ONWARDS

B.Sc. SOFTWARE
Programme Structure

Sem	Part	Course Code	Courses	Title of the Paper	T/P	Credits	Hours/ Week	Int.	Ext.	Total
I	I	2211T	T/OL	Tamil /Other Languages -I	T	3	6	25	75	100
	II	712CE	E	Communicative English - I	T	3	6	25	75	100
	III	22BSO1C1	CC	Programming in C	T	5	5	25	75	100
		22BSO1P1	CC	Programming in C Lab	P	4	4	40	60	100
		-	AL-IA	Mathematics/ Physics/ Information Technology/ Commerce	T	3	3	25	75	100
		-	AL-IA	Practical - Respective Allied Theory Course	P	2	2	40	60	100
	IV	22BVE1	SEC -I	Value Education	T	2	2	25	75	100
		-	-	Library / Yoga/ Counseling/Field trip	-	--	2	--	--	--
				Total		**22**	**30**	**205**	**495**	**700**
II	I	2221T	T/OL	Tamil/Other Languages-II	T	3	6	25	75	100
	II	722CE	E	Communicative English - II	T	3	6	25	75	100
	III	22BSO2C1	CC	Data Structures	T	5	5	25	75	100
		22BSO2P1	CC	Data Structures using C Lab	P	4	4	40	60	100
		-	AL-IB	Mathematics/ Physics/ Information Technology/ Commerce	T	3	3	25	75	100
		-	AL-IB	Practical - Respective Allied Theory Course	P	2	2	40	60	100
	IV	22BES2	SEC -II	Environmental Studies	T	2	2	25	75	100
		Naan Mudhalvan Course		Language Proficiency for Employability(Effective English)	-	2	2	25	75	100
				Total		**24**	**30**	**230**	**570**	**800**
III	I	2231T	T/OL	Tamil/Other Languages-II	T	3	6	25	75	100
	II	2232E	E	English for Enrichment– I	T	3	6	25	75	100
	III	22BSO3C1	CC	Programming in JAVA	T	3	3	25	75	100
		22BSO3C2	CC	Computer Networks	T	3	3	25	75	100
		22BSO3P1	CC	JAVA Programming Lab	P	3	3	40	60	100
		-	AL-II A	Mathematics/ Physics/ Information Technology/ Commerce	T	3	3	25	75	100
		-	AL- IIA	Practical - Respective Allied Theory Course	P	2	2	40	60	100
	IV	22BE3	SEC –III	Entrepreneurship	T	2	2	25	75	100
		-	NME-I	Adipadai Tamil Advance Tamil IT Skills for Employment/ MOOC'S	T	2	2	25	75	100
				Total		**24**	**30**	**255**	**645**	**900**
	I	2241T	T/OL	Tamil /Other Languages -IV	T	3	6	25	75	100
	II	2242E	E	English for Enrichment – II	T	3	3	25	75	100
		22BSO4C1	CC	Database Management Systems	T	4	4	25	75	100
		22BSO4C2	CC	Unix and Shell Programming	T	4	4	25	75	100

IV	III	22BSO4P1	CC	Database Management Systems Lab	P	3	3	40	60	100
		-	AL-II B	Mathematics/ Physics/ Information Technology/ Commerce	T	3	3	25	75	100
		-	AL- II B	Practical – Respective Allied Theory Course	P	2	2	40	60	100
	IV	-	NME-II	Adipadai Tamil Advance Tamil Small Business Management / MOOC'S	T	2	2	25	75	100
		Naan Mudhalvan Course		Digital Skills for Employability – (Microsoft-Office Fundamentals)	-	2	3	25	75	100
				Total		**26**	**30**	**230**	**570**	**800**
V	III	22BSO5C1	CC	Design Tools	T	4	4	25	75	100
		22BSO5C2	CC	Software Engineering	T	4	4	25	75	100
		22BSO5C3	CC	Web Technology	T	4	4	25	75	100
		22BSO5C4	CC	Programming in Python	T	4	4	25	75	100
		22BSO5P1	CC	Web Technology Lab	P	4	6	40	60	100
		22BSO5P2	CC	Programming in Python Lab	P	4	6	40	60	100
	IV	-	-	Carrier development/employability Skills	-	-	2	-	-	-
				Total		**24**	**30**	**180**	**420**	**600**
VI	III	22BSO6I		Internship		24	26	150	250	400
	IV	Naan Mudhalvan Coures		Emerging Technology for Employability(Course Name: Machine Learning*/Android app**/ Cyber Security***)	-	2	4	25	75	100
				Total		**26**	**30**	**175**	**325**	**500**
	III	22BSO6E1	DSE	Open Source Technology	T	6	6	25	75	100
		22BSO6E2		Mobile Application Development	T	6	6	25	75	100
		22BSO6E3		VB.NET	T	6	6	25	75	100
		22BSO6E4		Computer Graphics	T	6	6	25	75	100
		-	others	Library/Yoga etc	-	-	2	-	-	-
	IV	Naan Mudhalvan Course		Emerging Technology for Employability(Course Name: Machine Learning*/Android app**/ Cyber Security***)	-	2	4	25	75	100
						26	**30**	**125**	**375**	**500**
	III	22BSO6PR		Project		6	8	25	75	100
		22BSO6E1	DSE	Open Source Technology	T	6	6	25	75	100
		22BSO6E2		Mobile Application Development	T	6	6	25	75	100
		22BSO6E3		VB.NET	T	6	6	25	75	100
	IV	Naan Mudhalvan Scheme		Emerging Technology for Employability(Course Name: Machine Learning*/Android app**/ Cyber Security***)	-	2	4	25	75	100
				Total		**26**	**30**	**125**	**375**	**500**
				Grand Total		**146**	**-**	**-**	**-**	**4400**

*Machine Learning - Government Colleges
** Android App   - Government Aided College
***Cyber Security - Self financing College

Sem.	Part	Course Code	Title of the Paper	Credit	Hours/ Week	Max. Marks		
						Int.	Ext.	Total
I	III	71BEPP	Professional English for Physical Sciences –I	4	5	25	75	100
		72BEPP	Professional English for Physical Sciences –II	4	5	25	75	100
		*	Professional English for Physical Sciences –III	4	5	25	75	100
			Professional English for Physical Sciences –IV	4	5	25	75	100

*The Syllabus of Professional English for III & IV Semester will be provided after
   Receiving the syllabus from TANSCHE.

As per TANSCHE, the Professional English book will be taught to all four streams apart from the existing hours of teaching/additional hours of teaching (1hour/day) as a 4 creditpaper as an add on course on par with Major paper and completion of the paper is a must to continue his/her studies further.

- T/OL-Tamil/ Other Language, E – English
- CC-Core course –Core competency , critical thinking, analytical reasoning ,research skill & team work
- Allied / GEC -Exposure beyond the discipline
- AECC- Ability Enhancement Compulsory Course (Professional English & Environmental Studies) - Additional academic knowledge, psychology and problem solving etc.,
- SEC-Skill Enhancement Course - Exposure beyond   the discipline (Value Education , Entrepreneurship Course, Computer application for Science, etc.,
- NME -Non Major Elective – Exposure beyond the discipline
- DSE – Discipline specific elective –Additional academic knowledge, critical thinking, and analytical reasoning-Student choice - either Internship or Theory papers or Project + 2 theory paper. If internship – Marks = Internal (150 (75+75) two midterm evaluation through Viva voce + Report 150+ External Viva voce 100 = 400, If Project – Marks = Internal -50 +Thesis -100 + Viva voce 50 = 200 + 2 theory paper = 200 = 400
- MOOCs – Massive Open Online Courses
   *T- Theory, P-Practical

Semester - I					
Course code: 22BSO1C1	**Core Course- I**			T/P	C	H/W
	Programming in C			T	5	5
Objectives	➢ To learn the fundamentals of computer programming ➢ To learn the use of operators and statements in C language ➢ To learn the ways to write user defined functions and arrays ➢ To learn pointers, structures and union, the advanced concepts of C programming ➢ To learn the importance of file storage and handling them.					
Unit -I	**Overview of C:** Introduction to algorithm, flowchart, structured programming concept, programs – Compiler, Interpreter. Introduction to C Language: The C character set, identifiers and keywords, data types, constants, variables and arrays, declarations, expressions, statements, type conversion, symbolic constants.					
Unit-II	**Operators, I/O functions and Control Structures in C** **Operators and expressions**: Arithmetic operators, unary operator, relational and logical operator, assignment operators, the conditional operator, type conversion, Library function. **Data input and output**: Single character input, single character output, scanf, printf, puts gets functions, interactive programming. **Control statement**: Branching: if else statement, Looping, nested control structure, switch statement, jumping statements.					
Unit -III	**Functions**: Overview, function prototypes, passing arguments to a function, recursion. **Arrays**: Defining an array, passing array to functions, multidimensional arrays, **strings**: one dimensional character array, array of strings.					
Unit -IV	**Pointers**: Fundamentals, passing pointers to a function, pointers and one dimensional arrays, dynamic memory allocation, operation on pointers, pointer to an array, pointer to string, pointer to structure, pointers to function, array of pointers. **Structures and unions**: Defining a structure, processing a structure, user defined data types, structure and pointers, passing structure to function, self-referential structures, and union.					
Unit- V	**Data files:** opening and closing a data file, File Management Functions, reading and writing a data file, processing a data file, and unformatted data file, concept of binary file, Random access.					

Reference and Textbooks:-(APA Format)

Brian W Kernighan & Dennis Ritchie, 2001 *The C programming language*, IInd edition Eastern Economy Edition, Prentice Hall

Byron S Gottfried, 2010 *Programming with C*, Schaum's outlines 2nd Edition.

Forouzan, 2007 *Computer Science: A Structured Programming Approach Using C*, 3rd Cengage Learning

PradipDey, ManasGhosh, 2007 *Programming in C*, Oxford Higher Education

YashavantKanetkar,2008 *Working with C*, BPB publication.

Outcomes	➢ To be able to understand the structured programming concepts in problem solving. ➢ To be able to use various operators and statements and design a step by step procedure to get input data and solution to given problems. ➢ To be able to design user-defined functions and implement the concept of divide and conquer in solving complex problems, handle arrays and string data. ➢ To be able to use pointers, structures, unions in order to write C programs in an efficient manner ➢ To able to create and update files for permanent storage of data.

Semester - I					
Course code: 22BSO1P1	**Core Practical-I**		**T/P**	**C**	**H/W**
	Programming in C Lab		**P**	**4**	**4**
Objectives	➢ To learn and appreciate the use of various data types in C. ➢ To use control statements in automatic repetition of procedures and data replication ➢ To create homogeneous and hetrogeneous data structures to solve simple problems ➢ To write a simple programs involving pointer manipulation ➢ To get data from user and create data files for permanent storage and retrieval				

1. Implementation of the various Data Types in C.
2. Demonstration of for loop.
3. Demonstration of do...while loop.
4. Demonstration of while loop.
5. Demonstration of nested if (Hint: Use logical operators).
6. Demonstration of switch... case structure.
7. Implementation of arrays.
8. Implementation of multidimensional arrays (Hint: implement matrix operation).
9. Implementation of functions (Hint: Demonstrate call by value, call by reference).
10. Demonstration of various string operations (Hint: Usage of user defined functions only allowed).
11. Demonstration of pointer operations.
12. Demonstration of recursion (Hint: GCD, factorial, Fibonacci series).
13. Implementation of structures (Hint: simple structure operations, array of structures).
14. Implementation of pointers to structures.
15. Demonstration of dynamic allocation of memory (Hint: malloc, calloc, realloc, free).
16. Demonstration of various file operations on different types of files.

Reference and Textbooks:-(APA Format)

Brian W Kernighan & Dennis Ritchie,2001 *The C programming language*, IInd edition Eastern Economy Edition, Prentice Hall.

Byron S Gottfried, 2010 *Programming with C,* Schaum's outlines 2nd Edition.

Forouzan, 2007 *Computer Science: A Structured Programming Approach Using C*, 3rd Cengage Learning

PradipDey, ManasGhosh, 2007 *Programming in C*, Oxford Higher Education.

Outcomes	➢ To be able to get input data and format them suitably for output. ➢ To be able to use control statements and solve problems involving logical decision making. ➢ To be able to use arrays to keep data together and solve a range of problems. ➢ To be able to write user-defined functions and solve complex problems in divide and conquer method. ➢ To be able to create, manipulate and update data files for future use by C programs.

Semester - II					
Course code: 22BSO2C1		Core Course-II	T/P	C	H/W
		Data Structures	T	5	5

Objectives	➢ To understand the need and basics of data structures ➢ To learn various linked list data structures and use them for memory conservation compared to arrays ➢ To learn stack and queue data structures and their types ➢ To learn the tree data structure and their representation ➢ To learn different ways of searching data in real word problems
Unit -I	Introduction to data structures: The need for data Structure – Definitions - Data Structures - Arrays: Introduction, Range of an array - One dimensional array - Two dimensional arrays – Multidimensional arrays - Special types of matrices.
Unit-II	Linked lists: Introduction – Memory allocation - Benefits and limitations of linked list – Basic operations in a linked list - Types of linked list: Singly linked lists - Circular linked lists - Doubly linked lists.
Unit- III	Stack: Introduction- ADT stack - Implementation of stack- Application of stack - Queue: Introduction – Implementation of queues - Implementation of basic operations on array based and linked list based queue - Circular Queues.
Unit -IV	Trees: Introduction – Binary Trees - Representation of binary trees - Binary tree Traversals – Non-recursive algorithm for preorder traversal – Threaded binary trees - Expression Trees.
Unit- V	Binary Search Trees: Introduction – Creation of a Binary search tree – Searching an element in Binary search tree – Complexity of searching in Binary search tree – Ordering elements in Binary search tree – Finding minimum and maximum element in Binary search tree – Deletion of element in Binary search tree – Applications of Binary search tree.

Textbook:

Chitra, P. T. Rajan, 2016 *Data Structures.* Vijay Nicol Imprints Pvt Ltd. McGraw Hill Education of India Pvt Ltd.,

Reference books:

Mark Allen Weiss Addison, 2002*Data Structure and Algorithm Analysis in C*, Wesley publishing company.

P.S.Subramanyam, 2013*C and C++ Programming concepts and Data Structures*, BS Publications.

Outcomes	➢ To be able to appreciate the use of data structures in structured problem solving ➢ To be able implement data structures arrays and linked list and different memory allocation schemes and use computer's memory economically in order to speedup processing. ➢ To be able to implement stack and queue data structures and solve real world problems that demands the use of those data structures.. ➢ To be able to implement tree data structure and traverse them to perform efficient searching for the given data.

Semester - II				
Course code: 22BSO2P1	Core Practical-II	T/P	C	H/W
	Data Structures using C Lab	P	4	4
Objectives	➢ To learn the ways of implementing various data structures using C program code. ➢ To write and execute programs in C to build homogeneous data structure array and perform operations on it. ➢ To write and execute programs in C to create different types of linked lists and perform operations on them. ➢ To write and execute programs in C to create stack and queue data structures and perform possible operations over them. ➢ To write and execute programs in C to create a binary tree and perform different types of traversals for searching and expression evaluation.			

1. Program to implement one and two dimensional arrays.

2. Program to implement Singly Linked list and perform add and delete operations.

3. Program to search an element in the linked list.

4. Program to implement doubly linked list and perform possible operations on it.

5. Program to find the largest element in singly linked list.

6. Program to Implement Stack using array.

7. Program to implement Stack using linked list.

8. Program to convert Infix expression to Postfix expression using stack.

9. Program to convert Infix expression to Prefix expression using Stack.

10. Program to Implement Queue using Array.

11. Program to implement Queue using linked list.

12. Program to implement Binary tree traversals.

13. Program to implement Binary Tree and perform binary search to find the given element.

Reference and Text Books:

Ashok N. Kamthane, 2004 *Introduction to Data Structures in C*, Pearson Education India

Achuthsankar S. Nair, 2009 *Data Structures in C*, PHI Learning Pvt. Ltd.,

Outcomes	➢ To be able to create and use data structures to solve real world problems. ➢ To be able to perform static allocation of memory for arrays, store and retrieve elements using subscript mechanisms. ➢ To be able to create linked list data structures and use computer's memory economically. ➢ To be able to create stack and queue data structures for problems demanding their use. ➢ To be able to create tree data structures and perform efficient search operations by traversing the trees.

Semester - III				
Course code: 22BSO3C1	Core Course- III	T/P	C	H/W
	Programming in Java	T	3	3

Objectives	➢ To learn the basic programming constructs of Java Language. ➢ To learn the use of different types of operators and control statements ➢ To learn the object oriented concepts supported by Java ➢ To learn to use system packages, user-defined packages, inheritance and threaded programming concepts to model the real world problems ➢ To learn to extend the use of Java programs in Web pages as applets and graphics
Unit -I	Java Evolution: Java History – Java Features – Java and Internet – World Wide Web –Web Browsers – H/W and S/W requirements – Java Support Systems – Java Environment. Overview of Java language: Introduction – Simple Java Program –Comments – Java Program Structure –Tokens – Java Statements – Implementing a Java Program – JVM – Command Line Arguments. Constants – Variables – Data Types – Type Casting.
Unit-II	Operators and Expressions: Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Special Operators – Arithmetic expressions, Evaluation of expression – Precedence of Arithmetic Operators – Type Conversions – Operator Precedence and Associativity – Mathematical Functions. Decision Making and Branching: If – if…..else – Nesting of if… Else – else if – switch - ? Operator. Decision Making and Looping: While – do – for – jump in loops – labeled loops.
Unit -III	Classes, Objects and Methods: Defining a class – Adding variables, methods – Creating objects – Accessing Class Members– Constructors – Methods overloading – static members – Nesting of Methods – Inheritance – Overriding methods – final Variables and methods – Final classes – finalizer methods – Abstract methods and classes – visibility control. Arrays, Strings and Vectors: Arrays – One Dimensional Arrays – Creating an array – Two Dimensional Arrays – Strings – Vectors – Wrapper Classes Interfaces: Multiple Inheritance Defining interfaces – Extending interfaces – implementing interfaces – Accessing interface variables.
Unit -IV	Packages: Java API Packages – Using system packages – Naming conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – hiding classes. Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the 'Runnable' Interface. Managing Errors and Exceptions: Types of errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using finally statement – Throwing our own Exceptions – Using Exceptions for Debugging.
Unit- V	Applet Programming: How applets differ from Applications – preparing to write applets – Building Applet Code – Applet life cycle – creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML file – Running the Applet – Passing parameters to Applets – Displaying Numerical values – Getting input from the user. Graphics Programming: The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs – Drawing Polygons – Line Graphs – Using Control Loops in Applets – Drawing Bar Charts.

Reference and Textbooks:-(APA Format)

E.Balagurusamy, *Programming with Java*, TATA McGraw-Hill Publishing Company Limited.

Herbert Schildt , *Java 2- The Complete Reference* , McGraw Hill Education (India) Private Limited.

John R.Hubbard, *Programming with Java (Schaum's Outline Series)* , McGraw-Hill International Edition

Dr.K.Somasundaram, 2008 *Programming in Java2*, Publisher : JAICO Publishing House.

Outcomes	➢ To be able to use the basic concepts of Java and appreciate the platform-independent feature of Java compared to other languages. ➢ To be able to use operators, functions and control statements in problem solving. ➢ To be able to use object oriented features of java using inheritance and interfaces in order

	to achieve reusability and extensibility in code and reduce redundancy of code.
	➢ To be able to use threads for parallel execution of code and perform exception handling to void run-time errors.
	➢ To be able to use applets as part of web pages and use the power and security of Java in Web pages.

Semester - III					
Course code: 22BSO3C2	**Core Course- IV**		T/P	C	H/W
	Computer Networks		T	3	3
Objectives	➢ To understand layered reference models of computer network, software and hardware required for networking. ➢ To learn the functionalities of Physical layer and various transmission modes and media. ➢ To learn how data packets are handled and error-free communication is ensured in data link layer ➢ To learn the routing methods and transport services performed by transport layer ➢ To learn how the user interacts with the network in application layer and secured communication				
Unit -I	**Introduction:** Uses of Computer Networks – Network Hardware –Network software – OSI and TCP/IP Reference models – **Example Networks:** Internet.				
Unit-II	**The Physical Layer:** Guided Transmission Media – Wireless Transmission– Communication Satellites – Public Switched Telephone Network – The Mobile Telephone System.				
Unit- III	**Data Link Layer:** Design Issues – Error Detection and Correction – Elementary Data link Protocols – Sliding Window Protocol - **Medium Access Control Layer:** Channel Allocation Problem – Multiple Access Protocol – Ethernet.				
Unit -IV	**Network Layer:** Design Issues – Routing Algorithms. **Transport Layer:** Transport Services – Elements of Transport Protocols.				
Unit -V	**Application Layer:** DNS– Electronic Mail – World Wide Web Architectural overview. **Network Security:** Cryptography – Symmetric Key Algorithms – Public Key Algorithms.				
Reference and Textbooks:-(APA Format) Andrew S.Tanenbaum, 2011*Computer Networks*, Prentice Hall of India Behrouz A.Forouzen, 2007 *Data Communication and networking*, Tata McGraw Hill Edition. Uyless Black, 1993 *Computer Networks*, 2nd Edition, PHI W.Stallings, 2013 *Data and computer communications*, 9th Edition, Pearson Education					
Outcomes	➢ Learn the technological trends of Computer Networking. ➢ Understand and use both wired and wireless transmission using computer networks. ➢ Understand and ensure error-free data transmission and protocol mechanisms ➢ Understand and use the techniques of routing for efficient communication and error detection and correction methods ➢ Understand the application layer functionality in presentation and securing of transmitted data with cryptographic algorithms.				

Semester - III					
Course code: 22BSO3P1		**Core Practical-III**	**T/P**	**C**	**H/W**
		Java Programming Lab	**P**	**3**	**3**
Objectives	➤ Learn to write solution procedures in Java using object orientation				
	➤ Learn to write solution procedures to model real world problems using advanced object oriented concepts inheritance and interfaces				
	➤ Learn to write solution procedures to solve complex problem in a parallel way using threads and handle exceptions				
	➤ Learn to create user-defined packages to achieve reusability and extensibility in coding.				
	➤ Learn to use Java programs as part of web pages using applets.				

Group – A
1. To perform addition and subtraction of complex numbers using class and objects.
2. Program to calculate area of Square and Rectangle using Method Overloading.
3. Program to implement User-Defined Exception (minimum 3 types of exception should be used).
4. Create two threads such that one of the thread generate Fibonacci series and another generate perfect numbers between two given limits.
5. Using command line arguments, test if the given string is palindrome or not.
6. Program to perform Matrix Addition and Multiplication using class.
7. Program to perform the String operations. (Reverse, Copy, Concatenate, Compare)
8. Program to display student mark details using Single Inheritance.
9. Using multilevel inheritance process student marks.
10. Implement multiple Inheritance for payroll processing.
11. Program to implement banking transaction using Interface.
12. Program to implement Multiple Thread.
13. Program to implement Package.

Group –B
1. Applet Program to Displaying Digital Clock . (Ex: 09:15:45 AM)
2. Applet Program to Draw our National Flag.
3. Applet Program to Draw Bar Charts with different colors.
4. Applet Program to draw Building with attractive colors.
5. Applet Program to addition and multiplication of two numbers
6. Write applets to draw the following Shapes:
7. **(a).** Cone **(b).** Cylinder **(c).** Square inside a Circle **(d).** Circle inside a Square
8. Write an applet Program to design a simple calculator.
9. Write an Applet Program to animate a ball across the Screen.

Note:
   One Question from Group A and another one Question from Group B is compulsory for University Examination.

Reference and Text Books:	
Harvey M. Deitel, 2002 *Java in the Lab*, 4th Edition, Pearson	
Kailash Chandra Upadhyay, 2021*Complete Core Java Tutorial Book*, Notion Press Media	
Outcomes	➤ To be able to solve simple real world problems using object oriented features of Java.
	➤ To be able to model real world problems as object oriented problems and solve them
	➤ To be able to use exception handling and threaded programming to achieve paralellism in execution.
	➤ To be able to create and use user-defined packages in order to reuse and extend the code in future projects.
	➤ To be able to use Java code embedded in Web pages for global sharing of programs

	Semester – IV			
Course code:	**Core Course-V**	**T/P**	**C**	**H/W**
22BSO4C1	**Database Management Systems**	**T**	**4**	**4**
Objectives	➢ To study and learn the database environment ➢ To learn the architecture of Database and understand data models behind it ➢ To learn the E-R model and Relational Model ➢ To learn the process of normalization and avoid all types of dependencies and anomalies ➢ To learn SQL queries to be applied over relational database and optimize them for faster response to users			
Unit -I	Databases and Database Users: Characteristics of database approach, Actors behind the scene, Workers behind the scene. Advantages of using the DBMS approach, Database application, Disadvantages.			
Unit-II	Database System-Concepts and Architecture: Data Models, Schema, and Instances, Three schema architecture and data Independence, Database languages and interfaces, The database system environment, Centralized and client/server architecture for DBMS, Classification of DBMS.			
Unit -III	Data modeling using the E-R Model: Entity types, Entity sets, Attributes, and Keys, Relationship types, Weak entity types, The Relational Data Model and Relational Database Constraints.			
Unit -IV	Relational database design-informal guidelines for relation schema-functional dependencies-normal forms based on primary key-Boyce codd normal form- Properties of relational decompositions- Algorithms for relational database schema design, Multi-valued dependencies and forth normal form, Join dependencies and fifth normal form.- file organization and indexes-secondary storage device-buffering of blocks.			
Unit -V	Translating SQL Queries into Relational Algebra- Algorithms for External Sorting- Algorithms for SELECT and JOIN Operations- Algorithms for PROJECT and Set Operations-Implementing Aggregate Operations and OUTER JOINs- Combining Operations Using Pipelining- Using Heuristics in Query Optimization- Overview of Query Optimization in Oracle- Semantic Query Optimization			
Reference and Textbooks:-(APA Format)	C.J.Date, 1990 "*An Introduction to Data Base Systems*,", Volume L Addison Wesley, Reading, MA R Elmasri, S B Navathe, 2010 "*Fundamentals of Database Systems*", D V L N Somayajulu, S K Gupta, 6th Edition, Pearson Education,. (Chapter I,II,III,IV,VIII,IX,X) H.F. Korth, A Silberschatz and S. Sudarasan, 2010 "*Database System Concepts*", Computer Science Series, McGraw-Hill			
Outcomes	➢ To be able to analyze Data Base Management System design methodology. ➢ To be able to master various data modeling using. ➢ To be able to create entity relations and convert them into database specifications ➢ To be able to perform normalization process and arrive at database eliminating all types of dependencies. ➢ To be able to apply simple and complex SQL queries to extract data from the database.			

Semester – IV				
Course code: 22BSO4C2	**Core Course- VI**	**T/P**	**C**	**H/W**
	Unix and Shell Programming	**T**	**4**	**4**

Objectives	➢ To understand the features and structure of unix operating system ➢ To learn and use basic commands of unix and underlying structure of file system ➢ To learn to use vi editor and write create files using it ➢ To learn the features shell command interpreter and write scripts using control statements in it.
Unit -I	**Getting started with Unix:** Unix – Hardware requirements for Unix – Salient features of Unix – Unix system organisation – Types of Shell – The Unix file system – Creating files – Listing files and directories – Making file permissions – Directory permissions.
Unit-II	**The Unix File system:** The boot block – The super block – The Inode table – Data blocks – Accessing Unix in files – Storage of files – Disk related commands – Essential Unix commands: cal, banner, touch, file – File related commands: wc, sort, cut, grep, dd – Viewing files.
Unit -III	**Vi Editor:** Why vi? – Modes of operation – Editing session – Adding text – Deleting text – Overwriting text – Quitting vi editor – Commands for positioning cursor in the window and File – Miscellaneous commands – Commands for quitting vi.
Unit -IV	**Processes in Unix:** ps command – Background processes – The nohup command – Killing a process – Changing process priorities – Scheduling of processes – Write command – Wall command.
Unit- V	**Shell Programming:** The first shell script – Shell variables – Shell keywords – Assigning values to variables – Decision making statements – Looping statements – Shell Metacharacters.

Text Book:
     Yashavant P.Kanetkar, *Unix Shell Programming*, BPB Publications
Reference Books:
  Randal K. Michael, *Mastering Unix Shell Scripting*, Wiley Publications.

  Sumitabha Das, *Unix Concepts and Applications*, Tata McGraw-Hill Publishing Company Limited.

Outcomes	➢ To be able to understand the structure of unix sytems and able to change file permissions ➢ To be able to create files and use file related commands in unix ➢ To be able to use vi editor to create files containing text or commands ➢ To be able to run the processes in different modes to utilize the hardware to the maximum extent possible ➢ To be able to automate the execution of sequence of shell commands using control statements in shell scripts.

	Semester - IV			
	Core Practical-IV	**T/P**	**C**	**H/W**
Course code: 22BSO4P1				
	Database Management Systems Lab	**P**	**3**	**3**
Objectives	➢ To learn the design of database tables in Oracle ➢ To learn and use query language SQL ➢ To learn to write simple and complex queries over database tables ➢ To learn to use set operators between database tables ➢ To learn to automate the execution of query sequence using SQL program code			
Cycle -I	1. Write a program for creation of database using SQL. 2. Write a program for Manipulation of database using SQL. 3. Write a program using oracle to prepare a report for the newspaper vendor in the proper format by calculating return, profit and loss details. 4. Write a SQL queries to prepare the five student's grade details.			

Cycle-II	5. Consider the following relation Student
	<id, name, department> Marks<id, subject_OS, subject_JAVA>
	Construct the following SQL Queries using AND OR NOT OPERATION, UNION, INTERSECTION and PROJECTION.
	• Find the id of students who have passed in at least one subject.
	• Find the id of students who have passed in all the subjects.
	• Find the id of students who passed only in subject_JAVA but not in subject_OS.
	
	6. Consider the following relation:
	Employee<id, name, project, salary>
	Construct the following SQL queries:
	• Display the employee details according to their salary (high to low).
	• Display the employee details according to their salary (high to low) and id.
	• Display the number of employees working in each project.
	
	7. Consider the following relation:
	Customer<id, name, branch, age>
	Depositor<id, account_number, balance>
	Loan<id, loan_number, amount>
	Construct the following queries in SQL.
	• Find the loan details of customers in the branch "Chennai".
	• Find the customer details who are depositors.
	• Find the bank balance of customers whose age is above 60; Consider the following relations:
	
	8. Consider the following relation
	Employee<id, name, department, salary>
	Construct the following queries in SQL
	    • Find the number of employees working in the "Sales" department.
	    • Find the employees" average salary in the department „Admin".
	    • Find the employee details who are earning maximum salary in each department.
	    • Find the minimum salary of employee
	    • Find the maximum salary of employee.
	    • Find the total salary of employees working in department „Academic".			

Cycle- III	9. Write a program using oracle to list department number, date, product description, Sales price. For each product quantity, list of each product and perform the following • Compute total amount of sales and profit • Accumulate and print total of sales and profit 10. Write a program using oracle to print the number, name and address of the donor for the following category • Blood donors having AB blood group • Blood donors in the age group between 16 to 25. • Female donors with A blood group in the age between 18 to 25. 11. Write a program using oracle to prepare the salary report for employees. Calculate • Dearness Allowance(58% basic pay) • Grade Pay • Net Pay • Annual Salary • Income tax pay • Total Deduction 12. Write a program to prepare the airline reservation database contains the reservation table and personal table. 13. Write a program to prepare the student grade calculation.
Reference and Textbooks:-(APA Format)	

C.J.Date, 1990 "*An Introduction to Data Base Systems*," Volume L Addison Wesley, Reading, MA

R Elmasri, S B Navathe, D V L N Somayajulu, S K Gupta, 2010 "*Fundamentals of Database Systems*", 6th Edition, Pearson Education.

H.F. Korth, A Silberschatz and S. Sudarasan, 2010 "*Database System Concepts*", Computer Science Series, McGraw-Hill

Outcomes	➢ To be able to design and implement a database schema for a given problem in any domain ➢ To be able to create tables with constraints and add / update data using SQL queries ➢ To be able to write PL/SQL program code to execute queries one by one automatically without human intervention ➢ To be able to use advanced features of PL/SQL functions, triggers, cursors and packages and write sophisticated program code.

	Semester -V			
Course code: 22BSO5C1	**Core Course-VII**	**T/P**	**C**	**H/W**
	Design Tools	**T**	**4**	**4**

Objectives	➢ To learn the basics of 2D and 3D design tools ➢ To learn 2D tools and 3D tools for mobile and web interfaces ➢ To learn microsoft office packages ➢ To learn Adobe for audio and video editing ➢ To learn 3D design
Unit -I	**Principles of 2D Design and Designing using Photoshop**-Understanding the elements of two - dimensional design-all concepts of forms and structures -Using Powerpoint - Excel worksheet - working with Word Understanding of how to develop 2D design using the sophisticated Adobe photoshop tool - creating layout design for mobile and web - Image editing and optimization techniques
Unit-II	**Designing for web and mobile interfaces**- Develop layout design - different form factors in designing - User interface and UI designing - User experience - Different types of Layout design - Identify the five parts of Elements and set up your computer, camera, and monitor - Import, organize, and keep track of your imported media library - Develop advanced image retouching skills - Discover how to add text and graphics to photographs - Cultivate your understanding of multi-image, multi-layered editing techniques
Unit- III	**Audio and video editing using Adobe premiere -** Basics of Audio and audio editing - types of video formats - Video editing techniques - working with 360 video for VR headsets - animating graphics - video and exporting techniques
Unit- IV	**Basics of Illustration -** Learn Illustration using Coreldraw - how to use different tools such as Pen, Magic wand, marquee, text - Create Illustrations using templates - Converting sketches to vectors - Combining photos and drawings
Unit -V	**3D Design using Blender -** Getting started with 3D design - Keyframe animation - Character design - 3D scene creation - Importing and exporting 3D models..

Text and Reference Books:

Basics of Illustration

Dorothy House *Microsoft Word, Excel, and PowerPoint: Just for Beginners*

Faulkner Andrew, *Mastering Adobe Photoshop Elements 2021: Boost your image-editing skills using the latest tools and techniques in Adobe Photoshop Elements*, 3rd Edition

Jago Maxim *Adobe Premiere Pro CC Classroom in a Book*

James Chronister, *Blender Basics: A Classroom Tutorial Book*

Wucius Wong, *Principles of Two-Dimensional Design*

Outcomes	➢ To be able to do 2D and 3D design for mobile and web applications ➢ To be able to use microsoft office to create integrated documents ➢ To be able to edit the given audio and video files ➢ To be able to use drawing and photo editing features of Corel Draw ➢ To be able to create 3D design using Blender

Semester - V				
Course code: 22BSO5C2	**Core Course-VIII**	**T/P**	**C**	**H/W**
	Software Engineering	**T**	**4**	**4**
Objectives	- To learn the concepts of software engineering and plan a software project - To learn cost estimation techniques and define software requirements - To learn different methods of software design - To learn different ways of testing a software and implement - To learn software maintenance tools and techniques			
Unit -I	**Introduction:** Introduction to software engineering – some definitions – some size factors – quality and productivity factors – managerial issues Planning a software project: Defining the problem – developing a solution strategy – planning the development process – planning an organizational structure – other planning activities			
Unit-II	**Software Cost Estimation:** software cost factors – software cost estimation techniques – estimating software maintenance costs **Software Requirements Definition:** The software requirements specification – formal specification techniques			
Unit- III	**Software Design:** Fundamental design concepts – modules and modularization criteria – design notations – design techniques – Stepwise refinement – Integrated top down development – Jackson Structured Programming - Detailed design considerations – test plan – milestones, walkthroughs and inspections – design guidelines			
Unit- IV	**Software Implementation:** Structured coding techniques – coding style – standards and guidelines - Verification and validation techniques – Quality Assurance – Walkthrough and inspection - Unit Testing and Debugging – System Testing			
Unit- V	**Software Maintenance:** Enhancing maintainability during development – managerial aspects of software engineering – configuration management – source code metrics – other maintenance tools and techniques			
Reference and Textbooks:-(APA Format) Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, *Fundamentals of Software Engineering*. Prentice Hall of India Pvt. Ltd. Pankaj Jalote, *An Integrated Approach to Software engineering*. Narosa Publishing House. Richard E. Fairley, *Software Engineering Concepts*. Tata McGraw Hill Publishing Company. Roger S. Pressman, *Software Engineering – A Practitioner's approach*, Tata McGraw Hill Publishing Company.				
Outcomes	- To be able to develop a perfect plan for a successful software project - To be able to perform cost estimation well in advance to avoid loss at a later stage - To be able to give a perfect design for software projects using design guidelines - To be able to implement and test a finished software project - To be able to maintain a finished software project after implementation			

Semester - V					
Course code: 22BSO5C3		**Core Course-IX**	**T/P**	**C**	**H/W**
		Web Technology	**T**	**4**	**4**
Objectives	➢ To learn basic formatting tags in HTML ➢ To learn the ways of creating hyperlinks, data in table, frames to manage screen space ➢ To learn the style features of web elements ➢ To learn the features javascript language ➢ To learn the ways to create interactive web pages using client side javascript code				
Unit -I	**Structuring Documents for the Web:** Introducing HTML and XHTML, Basic Text Formatting, Presentational Elements, Phrase Elements, Lists, Editing Text, Core Elements and Attributes, Attribute Groups. Links and Navigation: Basic Links, Creating Links with the <a> Element, Advanced E- mail Links. Images, Audio, and Video: Adding Images Using the <img> Element, Using Images as Links Image Maps, Choosing the Right Image Format, Adding Flash, Video and Audio to your web pages.				
Unit-II	**Tables:** Introducing Tables, Grouping Section of a Table, Nested Tables, Accessing Tables. Forms: Introducing Forms, Form Controls, Sending Form Data to the Server. Frames: Introducing Frameset, <frame> Element, Creating Links Between Frames, Setting a Default Target Frame Using <base> Element, Nested Framesets, Inline or Floating Frames with				
Unit- III	**Cascading Style Sheets**: Introducing CSS, Where you can Add CSS Rules. CSS Properties: Controlling Text, Text Formatting, Text Pseudo Classes, Selectors, Lengths, Introducing the Box Model. More Cascading Style Sheets: Links, Lists, Tables, Outlines, The :focus and :activate Pseudo classes Generated Content, Miscellaneous Properties, Additional Rules, Positioning and Layout wit, Page Layout CSS , Design Issues.				
Unit- IV	**Java Script:** How to Add Script to Your Pages, Variables and Data Types – Statements and Operators, Control Structures, Conditional Statements, Loop Statements – Functions - Message box, Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes.				
Unit -V	**Working with JavaScript**: Practical Tips for Writing Scripts, JavaScript Objects: Window Object - Document object - Browser Object - Form Object – Navigator object Screen object - Events, Event Handlers, Forms – Validations, Form Enhancements, JavaScript Libraries.				
Reference and Textbooks:-(APA Format) Chris Bates, *Web Programming*, 3rd Edition, Wiley Publishing Jon Duckett, *Beginning HTML, XTML, CSS and Java script*, Wiley Publishing M. Srinivasan, *Web Technology: Theory and Practice*, Pearson Publication					
Outcomes	➢ To be able to design simple web pages using basic tags ➢ To be able to format and display data in tables ➢ To be able to design style sheets to change and control the appearance of a website automatically without changing the code in each and every page ➢ To be able to use the constructs of Javascript to write client side script for user interaction ➢ To be able to use document object model supported by Javascript and perform event driven programming based on user's actions				

Semester - V					
Course code: 22BSO5C4	**Core Course-X**			**T/P**	**C**	**H/W**
	Programming in Python			**T**	**4**	**4**
Objectives	➢ To understand the basic features of Python language ➢ To learn writing user-defined functions and scripting in Python ➢ To learn string handling functions and list data structure ➢ To learn to handle tuples and files ➢ To learn object oriented features of Python					
Unit -I	**Introduction to Python:** Introduction-Python Overview-Comments-Identifiers-Reserved Keywords-Variables-Standard Data type-Operators-Statements and Expressions-String Operations-Boolean Expressions-Control Statements-Iteration Statements-Input from Keyboard.					
Unit -II	**Function**: Introduction-Built-in Functions-User defined Functions- Python Recursive Function-Writing Python Scripting					
Unit - III	**Strings**: Introduction-String handling functions-String Formatting operator and functions. Lists: Value & Accessing Elements-Deleting elements from List-Built-in List Operators and methods					
Unit - IV	**Tuple, Files & Exceptions:** Introduction-Creating Tuple-Accessing Tuple-Tuple Assignment - Tuple as Return Value-Basic Tuple Operations and Functions-Files: Text File- Directories-Exceptions: Exception with arguments-User-Defined Exceptions.					
Unit - V	**Classes & Objects:** Introduction-class Definition-creating Objects-Objects as a Arguments-Object as Return Values-Built-in Class Attributes-Inheritance-Method Overriding-Data Encapsulation-Data Hiding.					
Reference and Textbooks:-(APA Format) Allen Downey,2012 *How to think like a computer scientist : learning with Python* , Jeffrey Elkner, Chris Meyers Dr. Anita Goel, 2010 *Computer Fundamentals*, Pearson Education T. Budd,2011 *Exploring Python*, 1ˢᵗ Edition, TMH Balagurusamy, 2016 *Introduction to Computing & Problem Solving Using Python*", Mc Graw Hill Education						
Outcomes	➢ To be able to learn the basic features and write simple programs in Python ➢ To be able to write user=defined functions to solve complex problems in divide and conquer way ➢ To be able to solve problems that require string handling and list data structure ➢ To be able to handle tuples and files ➢ To be able to solve problems in object oriented way					

Semester – V					
Course code: 22BSO5P1	Core Practical-V		T/P	C	H/W
	Web Technology Lab		P	4	6

Objectives	➢ To learn the basic features of HTML and Javascript
	➢ To learn formatting text and images on web pages
	➢ To learn the fundamentals of Javascript language
	➢ To learn to write javascript programs for user interaction with web pages
	➢ To learn to create forms for data entry and handle use events

1. Create a form having number of elements (Textboxes, Radio buttons, Checkboxes, and so on). Write JavaScript code to count the number of elements in a form.
2. Create a HTML form that has number of Textboxes. When the form runs in the Browser fill the textboxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been left empty.
3. Develop a HTML Form, which accepts any Mathematical expression. Write JavaScript code to Evaluates the expression and Displays the result.
4. Create a page with dynamic effects. Write the code to include layers and basic animation.
5. Write a JavaScript code to find the sum of N natural Numbers. (Use user-defined function)
6. Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.
7. Create a form for Student information. Write JavaScript code to find Total, Average, Result and Grade.
8. Create a form for Employee information. Write JavaScript code to find DA, HRA, PF, TAX, Gross pay, Deduction and Net pay.
9. Create a form consists of a two Multiple choice lists and one single choice list
   (a)The first multiple choice list, displays the Major dishes available (b)The second multiple choice list, displays the Starters available. (c)The single choice list, displays the Soft drinks available.
10. Create a web page using two image files, which switch between one another as the mouse pointer moves over the image. Use the on Mouse Over and on Mouse Out event handlers.

Text and Reference Books:

Chris Bates, *Web Programming*, 3rd Edition, Wiley Publishing

Jon Duckett, *Beginning HTML, XTML, CSS and Javascript* , Wiley Publishing

M. Srinivasan, *Web Technology: Theory and Practice*, Pearson Publication

Paul J. Deitel, Dr. Harvey M. Deitel, *Internet and World Wide Web : How to Program*, 4th Edition, 2008

Web resource:

https://vdoc.pub/download/internet-world-wide-web-how-to-program-fourth-edition-416i3k2uenf0

Outcomes	➢ To be able to design web pages
	➢ To be able to design a full-fledged website by linking web pages designed
	➢ To be able to add user interaction facility to web pages using client side javascript coding
	➢ To be able to design forms on web pages to collect data from user

Semester – V					
Course code:	Core Practical-VI		T/P	C	H/W
22BSO5P2	**Programming in Python Lab**		P	4	6
Objectives	➢ To learn the fundamentals of Python language ➢ To learn writing programs to solve simple problems ➢ To learn to implement stack, queue data structure ➢ To learn to use tuple and sequence features of Python ➢ To learn to handle files				

1. Create a simple calculator to do all the arithmetic operations
2. Write a program using nested if statement
3. Write a program using for loop
4. Write a program using while loop
5. Write a program to implement stack data structure
6. Write a program to implement queue data structure
7. Write a program to demonstrate tuple and sequence
8. Create new module for mathematical operations and use in your program
9. Write a program to read and write files, create and delete directories
10. Write a program to handle exceptions
11. Write an objected oriented program using classes
12. Write a program to create address database using MySQL as back-end
13. Write a program using string handling and find patterns using regular expressions
14. Write a program to parse apache log file
15. Design GUI application program using pygtk

Outcomes	➢ To be able to design solution to simple problems ➢ To be able to implement data structures to solve complex problems ➢ To be able to create reusable modules ➢ To be able to solve real world problems using object oriented programming ➢ To be able to design application with GUI

Semester – VI				
Course code: 22BSO6E1	**DSE-I**	**T/P**	**C**	**H/W**
	Open Source Technology	**T**	**6**	**6**
Objectives	➢ To introduce open source software and its types ➢ To impart knowledge on software license and copyrights ➢ To learn communities in open source ➢ To learn open source servers available ➢ To impart knowledge on ethics of using open source software, social and financial impact on open source software			
Unit -I	Introduction : Open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. History : BSD, The Free Software Foundation and the GNU Project.			
Unit -II	Open Source History, Initiatives, Principle and methodologies. Philosophy : Software Freedom, Open Source Development Model Licences and Patents: What Is A License, Important FOSS Licenses (Apache,BSD,GPL, LGPL), copyrights and copylefts, Patents Economics of FOSS : Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization			
Unit – III	Community Building: Importance of Communities in Open Source Movement-Jboss Community-Starting and Maintaining an Open Source Project – Open Source Hardware			
Unit – IV	Apache HTTP Server and its flavors- WAMP server (Windows, Apache, MySQL, PHP)- Apache, MySQL, PHP, JAVA as development platform.			
Unit – V	Open source vs. closed source Open source government, Open source ethics. Social and Financial impacts of open source technology, Shared software, Shared source.			
Reference and Textbooks:-(APA Format)				
Kailash Vedera, Bhavyesh Gandhi, 2009 *Open Source Technology*, First edition ,Laxmi Publications Paul Kavanagh,2004 *Open Source Software: Implementation and Management*, Elsevier, Digital Press, Illustrated edition.				
Outcomes	➢ Gain knowledge about open source domains ➢ Aware of licenses and patents related to open source software ➢ To be able to build communities in open source domain ➢ Make effective use of open sources WAMP, Apache, MySQL, PHP ➢ Aware of open source ethics and aware of social and financial impacts on open source software			

Semester – VI				
Course code: 22BSO6E2	**DSE-II**	**T/P**	**C**	**H/W**
	Mobile Application Development	**T**	**6**	**6**
Objectives	➢ Understand the market and business drivers of mobile applications ➢ To learn basic design of embedded systems and architecture of mobile applications ➢ To learn the advanced design of mobile application and integration of social media networking applications. ➢ To learn the architecture of android technology and integration with other networking applications. ➢ To learn the IOS technology and Core Data and SQLite for data persistence			
Unit -I	INTRODUCTION: Introduction to mobile applications – Embedded systems - Market and business drivers for mobile applications – Publishing and delivery of mobile applications – Requirements gathering and validation for mobile applications			
Unit -II	BASIC DESIGN: Introduction – Basics of embedded systems design – Embedded OS - Design constraints for mobile applications, both hardware and software related – Architecting mobile applications – user interfaces for mobile applications – touch events and gestures – Achieving quality constraints – performance, usability, security, availability and modifiability.			
Unit - III	ADVANCED DESIGN: Designing applications with multimedia and web access capabilities – Integration with GPS and social media networking applications – Accessing applications hosted in a cloud computing environment – Design patterns for mobile applications.			
Unit - IV	TECHNOLOGY I – ANDROID: Introduction – Establishing the development environment – Android architecture – Activities and views – Interacting with UI – Persisting data using SQLite – Packaging and deployment – Interaction with server side applications – Using Google Maps, GPS and Wifi – Integration with social media applications.			
Unit - V	TECHNOLOGY II – IOS Introduction to Objective C – iOS features – UI implementation – Touch frameworks – Data persistence using Core Data and SQLite – Location aware applications using Core Location and Map Kit – Integrating calendar and address book with social media application – Using Wifi - iPhone marketplace			
Reference and Textbooks:-(APA Format)				
David Mark, Jack Nutting, Jeff LaMarche and Frederic Olsson, 2013 *Beginning iOS 6 Development: Exploring the iOS SDK,* Apress James Dovey and Ash Furrow, 2012 *Beginning Objective C* , Apress Jeff McWherter and Scott Gowell, 2012 *Professional Mobile Application Development*, Wrox. Michael Galpin and Matthias Kappler, 2012 *Android in Practice*, Charlie Collins, DreamTech http://developer.android.com/develop/index.html				
Outcomes	➢ To be able to assess the basic requirements of mobile application ➢ To be able to design mobile application with basic features and integrate it with other networking applications ➢ To be able to design mobile application having multimedia and web access capabilities ➢ To able to develop full-fledged mobile application that interacts with servers and social media applications ➢ To be able to design user touch interfaces with IOS technology and integrates with other social media applications			

Semester - VI					
Course code: 22BSO6E3	**DSE-III**			T/P	C	H/W
	VB.NET			T	6	6

Objectives	➢ To learn the fundamental elements of .NET frame work ➢ To learn to use GUI elements of VB .NET in applications ➢ To learn to create and use menus in applications ➢ To learn to use in-built functions, control statements and dialogue boxes ➢ To learn to connect front-end VB.NET applications with back-end databases
Unit -I	**Introduction:** Overview of Microsoft .NET Framework - The .NET Framework components-The Common Language Runtime (CLR) Environment- The .NET Framework class Library - **Getting Started with Visual Basic .Net IDE :** Set up of work environment, Start Page, The Menu System, Toolbars, The New Project Dialog Box, Graphical Designers, Code Designers, The Object Explorer, The Toolbox, The Solution Explorer, The Class View Window, The Properties Window, The Dynamic Help Window, The Server Explorer, The Output Window, The Command Window - **Visual Basic Language Concepts :** Variables, Constants, Data Types, Operators, Control Structures and Loops - **Arrays :** Single and Multidimensional Array, Declaring, Dynamic Array.
Unit-II	**Introduction to Windows Common Controls:**Working with Form - Properties : Appearance, Behaviour, Layout, Windows Style etc, Methods and Events - Differentiate Procedure Oriented, Object Oriented and Event Driven Programming – Input Box- Message Box- **Working with Common Tool Box Controls:** Label , Button, Textbox , NumericUpDown , Check Box, Radio Button , Group Box , Control and all important Methods and Events.
Unit III	**Additional Controls and Menus of Windows:**Working with other controls of toolbox: Date Time Picker, List Box, Combo Box, Picture Box, Rich Text Box, Progress Bar, Masked Text Box, Link Label, Checked List Box - **Working with Menus:** Creating Menu, Inserting, Deleting, Assigning Short Cut Keys, Popup Menu.
Unit IV	**Inbuilt Functions and Dialog Box :**Inbuilt Functions : Mathematical Functions-String Manipulation - Dialog Boxes: OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog - Sub Procedures and Functions : Declaring, Passing and Returning Arguments, Exiting from it, Pass by Value and Pass by Reference - Exception Handling : Structured Error Handling (Try ....Catch ....finally), Unstructured Error Handling (On error go to line, goto 0, goto -1, resume next) - Multiple document interface (MDI) : MDI Parent Form and Child Form.**Object Oriented Programming:** Classes and objects – Inheritance – Polymorphism- Graphics class – Pen class – Brush class – File stream class – File mode enumeration – File stream class – File class – Directory class.
Unit V	**Database Access Using ADO.NET:**ADO .NET Object Model: Data provider - Dataset - ADO .NET Programming : Creating a Database Application, Creating Connection to a Database using ADO.NET , Populating Data in ADO.NET, Browsing Records, Data grid view, Editing, Saving, Adding and Deleting Records using bounded and unbounded.

Reference and Textbooks:-(APA Format)
Julia Case Bradley and Anita C Millspaugh, *Programming in Visual Basic.NET*, McGraw Hill Higher Education, 2002
StevenHolzner, 2005 *Visual Basic .NET Programming Black Book* , 1st Edition,Dreamtech Press
Shelly, Cashman, Quasney, 2012 *Publications, Microsoft Visual Basic .NET : Comprehensive Concepts And Techniques,* Cengage learning

Outcomes	➢ To be able to use .NET framework and appreciate paltform independency ➢ To be able to design applications with simple visual elements of VB.NET ➢ To be able to use sophisticated controls in applications ➢ To be able to create and use files and dialogue boxes ➢ To be able to create databases and connect with front-end VB.NET applications

Semester - VI					
Course code: 22BSO6E4		**DSE-IV**	**T/P**	**C**	**H/W**
		Computer Graphics	**T**	**4**	**4**

Objectives	➢ To understand the basic features of computer graphics and its applications ➢ To learn the transformation methods for two dimensional objects ➢ To learn clipping methods ➢ To learn the transformation methods for three dimensional objects ➢ To gain knowledge on user interface design methods
Unit - I	**Introduction:** Overview – Brief History – Applications of Computer Graphics – Video Display Generation – Input Devices – Hard Copy output Devices – Graphics System Software– Output Primitives: Point Plotting – Line Draw Algorithms – Using Equation of a line – DDA – Bresenham's algorithm – Circle Generation Algorithms – Drawing Ellipse
Unit - II	**Two Dimensional Transformations**: Transformation Principles – Basic Transformations – Matrix Representation – Composite Transformations.
Unit - III	**Two dimensional viewing and Clipping:** Viewing Transformations – Windows and viewpoints – Aspect Ratio – Clipping and Shielding: Point Clipping – Line Segment Clipping– Convex polygon clipping – Sitherland Hodgman Algorithm
Unit - IV	**Three Dimensional Transformations:** Concepts – Basic Transformations: Translation, Scaling, Rotation and Mirror Reflection – Matrix Representation – Composite Transformation.
Unit - V	**User Interface design:** Components of User interface – The User's model – The Command Language – Styles of Command Language – Information Display – Feedback – Examples.

Textbook:

M. Newman and F. Sproull, Interactive Computer Graphics, McGraw Hill, 2nd Edition, 1979.

Plastok and Gordon Kalley, Computer Graphics, McGraw Hill, 2nd Edition, 1986.

Reference books:

Donald D. Hearn, Pauline Baker, Computer Graphics C Version, Second Edition, Pearson, 2002

Foley Feiner, Computer Graphics, Principles and Practice – Addison Wesley, 2nd Edition, 1996.

Outcomes	➢ To appreciate the use of computer graphics in real world. ➢ To be able to perform two dimensional transformations on geometric shapes ➢ To be able to perform two dimensional clipping operations ➢ To be able to perform three dimensional transformations on geometric shapes ➢ To be able to perform user interface design