GOVERNMENT ARTS COLLEGE (AUTONOMOUS),SALEM-7

B.Sc. Computer Science

SYLLABUS

(Effective from the Academic Year 2021-2022)

Department of Computer Science

Vision

To provide an outstanding student experience, underpinned by high quality teaching and learning, resulting in career choices in the IT industry that extend beyond programming / software development and into latest fields like data science, data analytics.

Mission

- To provide effective learning ambiance to gain an excellent skill set to pursue a wide range of careers in the changing and challenging technological world.
- To help obtain wide-reaching technical skills and knowledge of latest technologies.
- To facilitate burgeoning researchers in the emerging areas of the discipline.

Programme Educational Objectives (PEO)

- To effectively communicate computing concepts and solutions to bridge the gap between academia and computing industries to initiate and create innovation.
- Effectively utilize the gained knowledge of computing principles and mathematical theory to develop sustainable solutions to current and future computing problems.
- To impart graduate attributes with employability skills to face current cut-throat global challenges.

Graduate Attributes (GA)

1. **Disciplinary knowledge**: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.
2. **Information/digital literacy**: Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.
3. **Communication Skills:** Ability to express thoughts and ideas effectively in writing and orally; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
4. **Cooperation/Team work:** Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group.

5. **Leadership readiness/qualities:** Capability for mapping out the tasks of a team, formulating an inspiring vision, building a team who can help achieve the vision, and using management skills to guide people to the right destination, in a smooth and efficient way.
6. **Problem solving**: Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.
7. **Analytical reasoning** : Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; **Scientific reasoning**: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
8. **Moral and ethical awareness/reasoning:** Ability to embrace moral/ethical values in conducting one's life; avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues.
9. **Multicultural competence**: Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
10. **Self-directed learning:** Ability to work independently; identify appropriate resources required for a project, and manage a project through to complete.

Programme Specific Outcomes (PSOs)

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

PSOs Number	PSOs Statement
PSO1	Apply algorithmic principles, and computer science theory in the design ofComputer-based systems.
PSO2	Apply higher degree of technical skills in problem solving and application development.
PSO3	Understand the concepts of relational database management which will include the aspects of database design, query languages and database system implementation.
PSO4	Show competence in various programming languages in the development of small to medium-sized application programs that demonstrate professionally acceptable coding and performance standard.

PSO5	Ability to learn and use new development tools, software framework and middleware that aid in the development of software projects.
PSO6	Demonstrate mastery of Computer Science in the following core knowledge areas • Data Structures , Databases • Operating Systems, Software Engineering • Computer Architecture, Computer Networks
PSO7	Develop the Modern Web Applications using the Client and Server Side Technologies and the Web Design Fundamentals.
PSO8	Apply the knowledge of GUI and Database programming todevelop effective software solutions needed for the government organizations and industrial areas.
PSO9	Develop technical and managerial skills needed to be an effective leader as an entrepreneur or in a software concern.
PSO10	An understanding of professional, ethical, legal, security and social issues and responsibilities.

Course Structure for B.Sc. Computer Science Programme – 2021 – 2022

Part	Category	No. of Courses	Total Credits	Marks
I	Tamil	4	12	400
II	English + Communicative English	4	12	400
III	Core Course (CC)	10	48	1000
III	Core Practical (CP)	6	18	600
III	Allied Course (AC)	4	16	400
III	Allied Practical (AP)	2	6	200
III	Major Based Elective Course(MBEC)	3	12	300
III	Project Work	1	4	100
IV	Skill Enhancement Course(SEC)	4	8	400
IV	Non-Major Elective Course(NMEC)	2	4	200
IV	Ability Enhancement Compulsory Course(AECC)	2	4	200
IV	Ability Enhancement Elective Course(AEEC)	1	2	100
IV	Professional English (Mandatory)	2	4	100
V	Extension Activity (Elective)	1	2	100
	TOTAL	**46**	**152**	**4500**

No. of New Courses Introduced : 8

No. of Courses Modified : 2

Percentage of Courses as per TANSCHE Norms : 90 %

Head of the Department **Principal**

GOVERNMENT ARTS COLLEGE(AUTONOMOUS), SALEM-7

B.Sc. Computer Science

For the candidates admitted from the Academic Year 2021-2022

S. No	Part	Course code	Course Name	Hours	Credits	Marks		Max
						IA	SE	
SEMESTER – I								
1	I	21FTL01	Foundation Tamil - I	5	3	25	75	100
2	II	21FEL01	Communicative English-I	5	3	25	75	100
3	III	21UCS01	Core Course I : Computer Fundamentals and Python Programming	5	5	25	75	100
4	III	21UCSP1	Core Practical - I: Python Programming	3	3	40	60	100
5	III	21AMT01	Allied – I : Course I :Allied Mathematics–I	5	4	25	75	100
6	III	21AMTP1	Allied – I : Practical : Allied Mathematics	3	--	--	--	--
7	IV	21AECC1	AECC –I: Value Based Education	2	2	25	75	100
8	IV	21UPE01	Professional English-I	2	2	50	--	50
TOTAL				**30**	**22**			**650**
SEMESTER – II								
1	I	21FTL02	Foundation Tamil - II	5	3	25	75	100
2	II	21FEL02	Communicative English-II	5	3	25	75	100
3	III	21UCS02	Core Course II : Programming in C	5	5	25	75	100
4	III	21UCSP2	Core Practical- II: C Programming	3	3	40	60	100
5	III	21AMT02	Allied – I : Course II : Allied Mathematics–II	5	4	25	75	100
6	III	21AMTP1	Allied – I : Practical : Allied Mathematics	3	3	40	60	100
7	IV	21AECC2	AECC-II: Environmental Studies	2	2	25	75	100
8	IV	21UPE02	Professional English-II	2	2	50	---	50
TOTAL				**30**	**25**			**750**
CUM-TOTAL					**47**			**1400**

S. No	Part	Course code	Course Name	Hours	Credits	Marks		Max
						IA	SE	
SEMESTER – III								
1	I	21FTL03	Foundation Tamil - III	5	3	25	75	100
2	II	21FEL03	Foundation English – I:	5	3	25	75	100
3	III	21UCS03	Core Course III : Data Structures and Algorithms	5	5	25	75	100
4	III	21UCSP3	Core Practical III: Data Structures using C	3	3	40	60	100
5	III	21ASTM1	Allied – II: Course I: Mathematical Statistics -I	5	4	25	75	100
6	III	21ASTP1	Allied – II : Practical : Mathematical Statistics	3	--	--	--	-
7	IV	21UCSS1	Skill Enhancement Course I: Career Prospects	2	2	40	60	100
8	IV	21UCSN1	Non-Major Elective Course I: Web Design: Basics	2	2	25	75	100
9	V	21EXAT1	Extension(Community Service) : National Cadet Corps	(Self Study)	2	--	100	100
		21EXAT2	Extension(Community Service) : National Social Service					
		21EXAT3	Extension(Community Awareness): Indian Heritage and Culture					
		21 EXAT4	Extension(Community Awareness) : Public Health and Personal Hygiene					
TOTAL				**30**	**24**			**800**
CUM-TOTAL					**71**			**2200**
SEMESTER – IV								
1	I	21FTL04	Foundation Tamil – IV	5	3	25	75	100
2	II	21FEL04	Foundation English – II	5	3	25	75	100
3	III	21UCS04	Core Course – IV: Web Technology	5	5	25	75	100
4	III	21UCSP4	Core Practical –IV: Web Technology Lab	3	3	40	60	100
5	III	21ASTM2	Allied – II: Course II: Mathematical Statistics -II	5	4	25	75	100
6	III	21ASTMP	Allied –II: Practical : Mathematical Statistics	3	3	40	60	100
7	IV	21UCSS2	Skill Enhancement Course II: Image Editing Tool	2	2	40	60	100
8	IV	21UCSN2	Non-Major Elective Course - II : Web Design: Advanced	2	2	25	75	100
9	IV	21AEEC1	Ability Enhancement Elective Course I : Gandhian Thoughts	(Self Study)	2	--	100	100
		21AEEC2	Ability Enhancement Elective Course II : Human Rights					
		21AEEC3	Ability Enhancement Elective Course III : Business Startup Fundamentals					
		21AEEC4	Ability Enhancement Elective Course IV : Professional Ethics & Cyber Netiquette					
TOTAL				**30**	**27**			**900**
CUM-TOTAL					**98**			**3100**

S. No	Part	Course code	Course Name	Hours	Credits	Marks		Max
						IA	SE	
SEMESTER – V								
1	III	21UCS05	Core Course V : Computer Organization & Architecture	5	4	25	75	100
2	III	21UCS06	Core Course VI : Visual Programming	5	5	25	75	100
3	III	21UCS07	Core Course VII : Relational Database Management Systems	5	5	25	75	100
4	III	21UCSM1	Major Based Elective I : Software Engineering	5	4	25	75	100
		21UCSM2	Major Based Elective II : Open Source Technology					
5	III	21UCSM3	Major Based Elective III : Multimedia Systems	5	4	25	75	100
		21UCSM4	Major Based Elective IV : Computer Graphics					
6	III	21UCSP5	Core Practical – V : RDBMS and Visual Programming	3	3	40	60	100
7	IV	21UCSS3	Skill Enhancement Course III : Graphic Design	2	2	40	60	100
TOTAL				**30**	**27**			**700**
CUM-TOTAL					**125**			**3800**
SEMESTER – VI								
1	III	21UCS08	Core Course VIII : Operating Systems	5	4	25	75	100
2	III	21UCS09	Core Course IX : Programming in Java	5	5	25	75	100
3	III	21UCS10	Core Course X: Computer Networks	5	5	25	75	100
4	III	21UCSM5	Major Based Elective V : Information Security	5	4	25	75	100
		21UCSM6	Major Based Elective VI : E-Commerce					
5	III	21UCSP6	Core Practical – VI : Java Programming	3	3	40	60	100
6	III	21UCSPR	Comprehensive Project	5	4	50	50	100
7	IV	21UCSS4	Skill Enhancement Course IV : Android Programming	2	2	40	60	100
TOTAL				**30**	**27**			**700**
Grand Total of Credits and Marks					**152**			**4500**

SEMESTER - I						
Course Code	**21UCS01**	**COMPUTER FUNDAMENTALS AND PYTHON PROGRAMMING**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - I**	**5**	**0**	**0**	**5**
Pre-requisite		Usage and operations of Computer	**Academic Year 2021-2022**			

Course Objectives:

- To built an extensive knowledge on the basic applications and the components of computer.
- To bring the ability to write, test and debug python programs.
- To train and develop control structures in python programs.
- To inculcate the exercise of compound data using lists, tuples and strings in python programs.
- To get familiarize in read and write data from and to files in python programs.

Expected Course Outcomes:

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

CO1	To understand the components and functions of computer and to retain the basic applications of computers and to interpret the program design tools.	K1/K2/ K4
CO2	To perceive variables, identifiers, data types, operators and expressions and to memorize reserved words and indentation and to apply skills in writing the first python program and evaluate the results obtained.	K1/K2/ K3/K4
CO3	To observe and employ control structures in python and to learn the requirements of passing parameters to functions.	K1/K2/ K3
CO4	To make clear the concepts of strings, lists and tuples and to execute their inbuilt functions in python programs.	K1/K2/ K3
CO5	To aware about the operations of set and dictionaries and to assess the operations implemented. To analyse the files operations executed in python programs.	K2/K4/ K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit : I	**Introduction to Computers**	**12 hours**

Introduction to Computers: Characteristics of Computers-Classification of Computers -Basic Applications of Computers - Components and Functions of a Computer System -Program Design Tools: Algorithms, Flowcharts, Pseudo codes - Types of Errors - Testing and Debugging Approaches.

Unit : II	**Basics of Python Programming / Operators and Expressions**	**12 hours**

Basics of Python Programming: Features of Python - Writing and Executing First Python Program-Literal Constants - Variables and Identifiers - Data Types - print(), input (), eval () function -Comments - Reserved Words - Indentation. Operators and Expressions: Types of Operators -Expressions in Python - Operator Precedence and Associativity.

Unit : III	**Decision Control Statements / Functions**	**12 hours**

Decision Control Statements: Branching Statements: if Statement - if-else Statement – Nested if Statements – if-elif-else Statement – Loop statement: while Loop – for loop - break Statement – continue Statement - pass Statement - else Statement used with Loops - Nested Loops. Functions: Syntax and basics of a function - Parameters and Arguments in a function - Local and Global scope of a variable - return statement - Recursive Functions - Lambda Function.

Unit: IV	Python Strings / Lists / Tuples	12 hours
Python Strings: Concatenating, Appending and Multiplying Strings - String Formatting Operator-Built-in String Methods and Functions - Slice Operation- ord() and chr() functions- in and not in operators - Comparing Strings. Lists: – Accessing values in Lists – Updating Values in Lists–Nested Lists – Cloning Lists – Basic List Operations – List Methods –Tuples :Creating Tuples–tuple() function – Inbuilt functions for Tuples- Indexing and Slicing.		
Unit: V	**Sets / Dictionaries / File Handling**	**12 hours**
Sets: Creating Sets - Set in and not in Operator - Python Set class - Set Operations - Dictionaries**:** Creating Dictionary - Adding, Replacing and Retrieving Values - Formatting Dictionaries. File Handling :File path – Types of Files – Opening and Closing Files- Reading and Writing Files – File positions – Renaming and Deleting Files – Directory Methods.		
	Total Lecture hours	**60 hours**

Text Books	
1	*ReemaThareja*, "Python Programming Using Problem Solving Approach", Oxford University Press, 2017.
2	*Ashok NamdevKamthane, Amit Ashok Kamthane,* "Programming and Problem Solving with PYTHON", McGraw Hill Education (India) Private Limited, Chennai, 2018.
Reference Books	
1	*Jeff McNeil*, "Python 2.6 Text Processing: Beginners Guide", Packet Publications, 2010.
2	*S. A. Kulkarni*, "Problem Solving and Python Programming", Yes Dee Publishing Pvt-Ltd, Chennai, 2017 (Anna University Regulation 2017).
3	*Allen B. Downey,* "Think Python: How to Think Like a Computer Scientist", O'Reilly, 1st Edition 2012.
Web References	
1	https://india.oup.com/orcs/9780199480173
2	http://www.pythonsoft.com
3	http://www.python.org.
4	http://www.edx.org.
5	https://developers.google.com/edu/python/?hl=en.
Assignments	
1	Control Structures
2	String Functions
3	Tuples and Dictionaries
4	File Handling
Course Designed By	
Dr. M. Rajalakshmi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**M**	**L**	**S**	**L**	**M**	**L**	**M**	**L**	**M**
CO2	**M**	**S**	**L**	**S**	**M**	**L**	**L**	**M**	**M**	**L**
CO3	**S**	**S**	**L**	**M**	**M**	**L**	**L**	**L**	**M**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**S**	**M**	**L**	**M**	**M**
CO5	**M**	**S**	**M**	**M**	**M**	**S**	**L**	**M**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - I						
Course Code	**21UCSP1**	**PYTHON PROGRAMMING**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - I**	**0**	**0**	**3**	**3**
Pre-requisite		Knowledge on Python	**Academic Year 2021-2022**			

Course Objectives:

- To built an extensive knowledge on operators in python programming.
- To strengthen the ability to conceive the concepts of control structure in python programming.
- To inculcate the exercise of compound data using lists, tuples and strings in python programming.
- To get familiarize in various operations of files in python programming.

Expected Course Outcomes:

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

CO1	To apply arithmetic operators in the python programming and evaluate it performance.	K3/K4/K5
CO2	To implement the decision control statements in the python programming.	K3/K4/K5
CO3	To execute the looping statements in the python programming and explore it opportunities.	K3/K4/K5
CO4	To implement the concepts of strings, lists and tuples and to execute their inbuilt functions in python programs.	K3/K4/K5
CO5	To execute and analyze the files operations in python programs.	K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1	**Types of operators**	**3 hours**
Create a simple calculator to do all the arithmetic operations.		
Practical 2	**Decision Control Statements**	**3 hours**
Write a program to find whether a given year is a leap year or not.		
Practical 3	**Loop Statements**	**3 hours**
Write a program using for loop to calculate the average of first n natural numbers.		
Practical 4	**Loop Statements**	**3 hours**
Write a program to find the matrix multiplication.		
Practical 5	**Functions**	**3 hours**
Write a program to compute the GCD of two numbers using functions.		
Practical 6	**Recursive Functions**	**3 hours**
Write a program to find the factorial of a given number using recursive functions.		
Practical 7	**String Functions**	**3 hours**
Write a python program to count all lower case, upper case, digits, and special symbols from a given string.		

Practical 8	**List Operation**	**3 hours**
Write a program to find the maximum of a list of numbers.		
Practical 9	**Tuple Operation**	**3 hours**
Write a python program to convert a tuple to a string.		
Practical 10	**File**	**3 hours**
Write a program that counts the number of tabs, spaces, and newline characters in a file.		
	Total Practical hours	**30 hours**
Course Designed By		
Dr. M. Rajalakshmi		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**S**	**L**	**S**	**M**	**L**	**L**	**M**	**S**	**L**
CO2	**S**	**S**	**L**	**M**	**M**	**L**	**L**	**M**	**S**	**M**
CO3	**S**	**S**	**L**	**M**	**M**	**L**	**L**	**M**	**S**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**S**	**L**	**M**	**M**	**M**
CO5	**L**	**S**	**M**	**S**	**S**	**M**	**M**	**M**	**M**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - II						
Course Code	**21UCS02**	**PROGRAMMING IN C**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - II**	**5**	**0**	**0**	**5**
Pre-requisite		Knowledge on computing fundamentals	**Academic Year 2021-2022**			

Course Objectives:

- To impart adequate knowledge on the need of programming languages and problem solving techniques.
- To enhance the analyzing and problem solving skills and use the same for writing programs in C.
- To develop an in-depth understanding of functional and logical concepts of C Programming.
- To provide exposure to problem-solving through C programming.
- To familiarize the basic syntax and semantics of C Language.
- Recollect various programming constructs and to develop C programs.

Expected Course Outcomes:

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

CO1	Understand the fundamentals of C programming. Choose the right data representation formats based on the requirements of the problem.Apply the specification of syntax rules for numerical constants and variables similarly other data types. Ability to work with textual information, characters and strings.	K2/K3
CO2	Design and develop C program to evaluate simple expressions and logical operations. Illustrate the control statements to write basic C programs.Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand. Improve the ability to use conditional statements and loops structures.	K2/K3/K4
CO3	Ability to work with arrays of complex objects.Develop & Implement C programs with suitable modules to solve the given problem. Implement different Operations on arrays, functions and pointers.Identify the usage of arrays, strings, functions and pointers. Improve the ability to develop function-oriented programs. Along with understanding of the distinction for passing arguments to/from functions.Modularize the code with functions so that they can be reused.	K2/K3/K4
CO4	Implement different Operations on structures, unions and files.Analyze the features of structures, union and their applications. Evaluate the importance of pointers with arrays and functions. Improve my understanding of the use of arrays and pointers also has improve the ability to use the dynamic memory.	K2/K3/K4
CO5	Demonstrate the concept of pointer and perform I/O operations. Develop C programs using file management concepts.Create, read and write to and from simple text and binary files.	K2/K3/K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit : I	**C Construct and Data Types**	**12 hours**

Introduction to C – Constants - Variables - Data types- Declaration of Variables - Declaration of Storage Classes - Symbolic Constants - Overflow and Underflow of Data.- Operator and Expressions: Types of Operators - Evaluation of Expressions - Precedence of Arithmetic Operators –Type Conversions in Expressions - Operator Precedence and Associativity.

Unit: II	Branching and Looping	12 hours
Managing Input and Output Operations: Reading and Writing Character – Formatted Input and Output.-Decision Making and Branching: Simple IF Statement–IF-ELSE Statement– Nested IF-ELSE Statements – ELSE IF Ladder - ? : Operator – SWITCH Statement – GOTO Statement – Decision Making and Looping: WHILE Statement –DO Statement –FOR Statement – Jumps in LOOPS– Skipping a Part of LOOP – Nested LOOPS.		
Unit :III	**Modularization of Programming**	**12 hours**
Arrays: Declaration and Initialization of Single dimensional - Two Dimensional Arrays - Dynamic Arrays. - Declaring and Initializing String Variable - Reading and Writing Sting to and from Terminal - Arithmetic Operations on Characters -User-defined Functions - Elements of User-defined Functions - Return Values and their Types - Function calls and Declaration - Argument or No Argument with or without Return Values - Return Multiple Values - Nesting of Functions – Recursion-Passing Arrays and Strings to Functions - Scope, Visibility and Life time of Variable.		
Unit: IV	**Structures and Unions**	**12 hours**
Structures and Unions: Defining, Declaring, Accessing and Initializing Structure - Copying and Comparing - Arrays of Structure - Structure within Structures - Unions - Pointers: Accessing, Declaring, Initializing Pointers - Chain of Pointers -Pointer Increment and Scale Factor - Pointers and Arrays - Array of Pointers - Pointers as Function Arguments- Functions Returning Pointers - Pointer to Functions - Pointers and Structure - Troubles with Pointers.		
Unit: V	**File Handling**	**12 hours**
File Management: Defining and Opening a File - Closing a File - Input / Output Operations on Files - Random Access to Files. Dynamic Memory Allocation: Allocating a block of Memory - Allocating Multiple blocks of Memory - Releasing the Used Space - Altering the Size of a Block. – Preprocessor :Macro Substitution - File Inclusion - Compiler Control Directives.		
	Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*E.Balagurusamy*, "Programming in ANSI C", Tata McGraw-Hill, Fourth Edition.
REFERENCE BOOKS	
1	*ReemaThareja*, "Programming in C", Oxford University Press, Second Edition, 2018.
2	*Kemighan, B.W and Ritchie, D.M*, "The C Programming Language", Second Edition, Pearson Education, 2006.
3	*Paul Deitel and Harvey Deitel*, "C How to Program", Seventh Edition, Pearson Publication.
WEB REFERENCES	
1	https://www.tutorialspoint.com/cprogramming/index.htm
2	https://www.programiz.com/c-programming
3	https://www.learn-c.org/
4	https://www.javatpoint.com/c-programming-language-tutorial
5	https://www.cprogramming.com/tutorial/c-tutorial.html
ASSIGNMENTS	
1	Array
2	Structures and Unions
3	Pointers
Course Designed By	
Mr. V. Vincent Arokiam Arul Raja	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	S	S	L	S	M	M	L	L	S	M
CO2	S	S	L	S	M	M	L	L	S	M
CO3	S	S	L	S	M	M	L	L	S	M
CO4	S	S	M	S	M	M	L	L	S	M
CO5	S	S	M	S	M	M	L	L	S	M

S - Strong **M**- Medium **L**- Low

SEMESTER - II						
Course Code	**21UCSP2**	**C PROGRAMMING**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - II**	**0**	**0**	**3**	**3**
Pre-requisite		Ability to develop algorithms for given problems	**Academic Year 2021-2022**			

Course Objectives:

- Ability to develop simple C programs.
- Represent and manipulate data with arrays, strings and structures.
- Use pointers of different types.
- Create, read and write to and from simple text and binary files.
- Modularize the code with functions so that they can be reused.
- Correct syntax errors as reported by the compilers.
- Identify and correct logical errors encountered during execution.
- Write the program on a computer, edit, compile, debug, correct, recompile and run it.
- To write diversified solutions using C language.

Expected Course Outcomes:

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

CO1	Understanding C construct with various data types declaration and defining.	K2/K3/K4/ K5
CO2	Understand and apply the various operators in simple calculations.	K2/K3/4/K5
CO3	Analyze and evaluate the conditional and loop statements and experience the flow of the C programming.	K2/K3/K4/ K5
CO4	Understand and analyze the modular approach of the programs using C functions.	K2/K3/K4/ K5
CO5	Store and retrieve data of any type using C file handling.	K2/K3/K4/ K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Practical 1	**Various Data Types Declaration and Defining**	**3 hours**

1.Write a C program to print your name, date of birth, mobile number and version of C.

Practical 2,3&4	**Simple Calculation**	**6 hours**

2.Write a C program to convert specified days into years, weeks and days.

3.Write a C program to generate a random number.

4.Write a C program that takes hours and minutes as input, and calculates the total number of minutes.

Practical 5,6	**Conditional Statement**	**7 hours**

5.Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies.

6.Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene.

Practical 7,8,9 & 10	Array and Function	8 hours
7.Write a program in C to count a total number of duplicate elements in an array and frequency of occurrence. 8.Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the function. 9.Write a program in C to find the Hailstone Sequence of a given number upto 1 using recursive function. 10.Write a program in C to count a number of lines, number of words and characters in a file.		
Practical 11 & 12	**File Handling**	**6 hours**
11.Write a program in C to encrypt a text file and decrypt it. 12.Write a program in C to replace a specific line with another text in a file.		
	Total Practical hours	**30 hours**
Course Designed By		
Mr. V. Vincent Arockiam Arul Raja		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**M**	**L**	**S**	**S**	**M**	**L**	**L**	**M**	**L**
CO2	**S**	**M**	**L**	**S**	**S**	**M**	**L**	**L**	**M**	**L**
CO3	**S**	**M**	**L**	**S**	**S**	**M**	**L**	**L**	**M**	**L**
CO4	**S**	**M**	**L**	**S**	**S**	**M**	**L**	**L**	**M**	**L**
CO5	**S**	**M**	**L**	**S**	**S**	**M**	**L**	**L**	**M**	**L**

S - Strong **M**- Medium **L**- Low

SEMESTER - III						
Course Code	**21UCS03**	**DATA STRUCTURES AND ALGORITHMS**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - III**	**5**	**0**	**0**	**5**
Pre-requisite		Knowledge on Data Structures	**Academic Year 2021-2022**			

Course Objectives:

- To create a wide knowledge on algorithms and data structures.
- To build the ability to handle linked list.
- To train and develop the application of trees.
- To inculcate the exercise of graphs and hash tables.
- To get familiarize in sorting and searching algorithms.

Expected Course Outcomes:

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

CO1	To understand and explore the usage of algorithms and to retain the norms of arrays, stacks and queue and to interpret with the data structures.	K1/K2/K3/ K4
CO2	To perceive the application of linked list and to remember its types and to apply skills in insertion and deletion of operation and evaluate the results obtained.	K1/K2/K3/ K4
CO3	To study and employ binary trees and to learn its traversals and applications.	K1/K2/K3
CO4	To make clear the concepts of graphs and hash tables and to learn its requirements while portraying data.	K1/K2/K3
CO5	To aware about the searching and sorting data and to assess its functions. To analyze type of file organization in the data structures.	K2/K3/K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Introduction of Algorithms**	**12 hours**

Introduction of algorithms, analyzing algorithms, **Arrays:** Representation of Arrays, Sparse Matrices, **Stack:** Definition – Operations of Stack-**Application of Stack:** Recursion, Evaluation of Expression - Infix to postfix Conversion. **Queue:** Definition – Operations of Queues–Various Queue Structures - Application of Queues.

Unit: II	**Linked List**	**12 hours**

Linked List: Comparison of sequential and linked representation -**Singly Linked list:** insertion and deletion operation. **Application of Singly Linked List:** Polynomial addition - Linked stacks and queues – **Double Linked List:** insertion and deletion operation.

Unit: III	**Binary Trees**	**12 hours**

Trees: Definition and Basic terminologies - **Binary trees:** Definition and comparison between tree and binary tree - Binary tree representations – **Binary Tree traversal:** Inorder, preorder and Post order traversal (recursive and non-recursive) - Threaded Binary trees – Conversion of a Forest Tree to Binary Tree – Binary tree for arithmetic expressions.

Unit: IV	**Graphs and Hash Tables**	**12 hours**

Graphs: Terminologies – Representation of Graphs: Adjacency and path matrix – **Graph Traversals:** Breadth First Search, Depth First Search - Spanning trees and Minimum cost spanning trees - Shortest path algorithm. **Hash tables:** Hashing functions.

Unit: V	Searching / Sorting / File Organizations	12 hours
Searching: Linear Search - Binary Search - Comparison of Linear & Binary Search. **Sorting :** Insertion - Radix - Quick - Heap - Merge. **File organizations:** Sequential Organizations, Random Organization and Linked Organization.		
	Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Ellis Horowitz, SartajSahni*, "Fundamentals of Data Structures", Galgotia publications, Ninth printing.
REFERENCE BOOKS	
1	*Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman* , "Data structure and Algorithms", Pearson Education Pvt. Ltd., 1st edition.
2	*Seymour Lipschutz*, "Data Structures" Tata Mcgraw Hill, Schaum's Outline Series (Revised First Edition), February 2014.
3	*DebasisSamanta*"Classic Data Structures", PHI, Second Edition.
WEB REFERENCES	
1	https://nptel.ac.in/courses/106/102/106102064/
2	http://nptel.ac.in/courses/106106133/
3	https://swayam.gov.in/explorer?searchText=data%20structures
4	https://www.tutorialspoint.com/data_structures_algorithms/
5	http://www.careerride.com/test.aspx?type=Data-structure
6	https://www.tutorialspoint.com/data_structures_algorithms/data_structures_algorithms_online_test.htm
7	http://www.withoutbook.com/OnlineTest.php
8	http://www.sitesbay.com/data-structure/index
ASSIGNMENTS	
1	Array representations and operations
2	Applications of Stack and Queue
3	Applications of Linked List
4	Binary tree traversal algorithms
5	Graph traversal algorithms
6	Spanning trees and Minimum cost spanning trees
7	Shortest path algorithm
8	Algorithms for Quick and Heap sorting
Course Designed By	
Mr. R. Venkatachalam	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**S**	**M**	**M**	**M**	**S**	**L**	**L**	**M**	**M**
CO2	**S**	**S**	**L**	**M**	**L**	**S**	**L**	**M**	**M**	**M**
CO3	**S**	**M**	**L**	**M**	**M**	**S**	**M**	**M**	**L**	**L**
CO4	**S**	**S**	**L**	**S**	**M**	**S**	**L**	**S**	**M**	**L**
CO5	**S**	**M**	**M**	**S**	**M**	**S**	**M**	**M**	**M**	**L**

S - Strong **M**- Medium **L**- Low

SEMESTER - III						
Course Code	**21UCSP3**	**DATA STRUCTURES USING C**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - III**	**0**	**0**	**3**	**3**
Pre-requisite		Knowledge on Data Structures	**Academic Year 2021-2022**			

Course Objectives:

- To built an extensive knowledge on algorithms and data structures using C programs.
- To strengthen the ability to handle linked list and double linked list in C programming.
- To inculcate the exercise of binary tree traversals in C programming.
- To get familiarize in searching and sorting algorithms using C programs.

Expected Course Outcomes:

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

CO1	To apply the array operations in C programming and evaluate it performance.	K3/K4/K5
CO2	To implement the queue operations in C programming.	K3/K4/K5
CO3	To execute the linked list operations in C programming and explore it opportunities.	K3/K4/K5
CO4	To implement the concepts of binary trees and to execute their operations in C programs.	K3/K4/K5
CO5	To execute and analyze searching and sorting algorithms using C programs.	K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1	**Arrays**	**3 hours**

Write a C program to create two array list of integers. Sort and store the elements of both of them in third list.

Practical 2	**Arrays**	**3 hours**

Write a C program to multiply two matrices A and B and store the resultant matrix in C using arrays.

Practical 3	**Operations of Stack using Arrays**	**3 hours**

Write a C program to implement the operation of STACK using array.

Practical 4	**Queue**	**3 hours**

Write a C program to create menu driven options to implement QUEUE to perform the following

(i) Insertion (ii) Deletion (iii) Modification (iv) Listing of elements

Practical 5	**Single Linked List**	**3 hours**
Write a C program to create Linked list representations of employee records and do the following operations using pointers. (i) To add a new record. (ii) To delete an existing record. (iii) To print the details about an employee. (iv) To find the number of employees in the structure.		
Practical 6	**Double Linked List**	**3 hours**
Write a C program to insert an element at the different positions of a doubly linked list.		
Practical 7	**Binary Tree Traversal**	**3 hours**
Write a C program to traverse the given binary tree using all traversal methods (recursive).		
Practical 8		**3 hours**
Write a C program to traverse the given binary tree using all traversal methods (non recursive).		
Practical 9	**Searching Algorithm**	**3 hours**
Write a C program to demonstrate Binary Search.		
Practical 10	**Sorting Algorithm**	**3 hours**
Write a C program to arrange a set of numbers in ascending order using QUICK SORT.		
	Total Practical hours	**30 hours**
Course Designed By		
Mr. R. Venkatachalam		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**S**	**L**	**S**	**M**	**S**	**L**	**M**	**S**	**L**
CO2	**S**	**S**	**L**	**M**	**M**	**S**	**L**	**M**	**S**	**M**
CO3	**S**	**S**	**L**	**M**	**M**	**S**	**L**	**M**	**S**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**S**	**L**	**M**	**M**	**M**
CO5	**S**	**S**	**M**	**S**	**S**	**S**	**M**	**M**	**M**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - III						
Course Code	**21UCSS1**	**CAREER PROSPECTS**	**L**	**T**	**P**	**C**
~~Core/Elective~~/Supportive		**SKILL ENHANCEMENT COURSE - I**	**0**	**0**	**2**	**2**
Pre-requisite		Knowledge on Mathematics , English and Programming Languages	**Academic Year 2021-2022**			

Course Objectives:

- To develop skills to write various types of Examinations for Placements
- To deliver skills that support the organization's strategic goals.

Expected Course Outcomes:

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

CO1	Understand the value of mathematics and verbal/non verbal reasoning to acquire the skills for appearing examinations national level.	K1/ K2/K3
CO2	Familiar with the various programming skills by the way of learning the programming languages to develop quality S/W and mange it.	K4/K5/K6
CO3	Learn various skills associated with the interviews to face corporate and government sectors for placements	K3/K4
CO4	Enhance the Leadership skills and Communication skills	K2/K3
CO5	Enhance the Problem Solving Skills	K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Practical 1	**Quantitative Aptitude**	**4 hours**

1. Conduct Online/Offline Aptitude Test using Objective Type Questions –50Nos./hour for the topics given below: 1.Arithmetic ability 2.Verbal Reasoning 3.Nonverbal Reasoning

Practical 2	**Technical Skills**	**4 hours**

2. Conduct Online/Offline Technical Skill Test using Objective Type Questions 50Nos./hour for various programming languages

Practical 3	**Interview Skills**	**4 hours**

3. Different types of interviews: Answering questions and offering information; Mock interviews; Body Language; Articulation of sounds; Intonation.

Practical 4	**Group Discussion**	**4 hours**

4. Team Management , Debates and Solution discovery

Practical 5	**Role Play**	**4 hours**

5. Scenario , Tasks and Process

Total Practical hours	**20 hours**

Course Designed By

Dr.R.Pugazendi

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**M**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**
CO2	**M**	**S**	**M**	**S**	**L**	**M**	**L**	**L**	**S**	**L**
CO3	**L**	**S**	**M**	**S**	**L**	**M**	**L**	**L**	**S**	**L**
CO4	**L**	**M**	**L**	**M**	**M**	**L**	**L**	**L**	**S**	**M**
CO5	**L**	**L**	**L**	**M**	**M**	**L**	**L**	**L**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - III

Course Code	21UCSN1	WEB DESIGN : BASICS	L	T	P	C
~~Core/Elective~~/Supportive		NON- MAJOR ELECTIVE COURSE - I	2	0	0	2
Pre-requisite		Knowledge on Computer Hardware & Software	Academic Year 2021-2022			

Course Objectives:

- To provide basic idea on web design.
- To provide insight on various elements of HTML.
- To acquire knowledge about HTML Comments and Links.
- To learn the insertion of Ordered & Unordered lists within a Web Page.

Expected Course Outcomes:

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

CO1	Understand the concept of HTML Tags.	K1/K2
CO2	Apply Formatting Tag in HTML Scripts.	K2/K3
CO3	Understand and Apply Various Image Tag in HTML Scripts.	K2/K3
CO4	Analyze the Hyperlinks in HTML Scripts.	K3/K4
CO5	Develop the concept of HTML List and to create a Web Pages using HTML.	K4/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	HTML Overview & Tags	5 hours

Basic HTML Document - HTML Tags - HTML Document Structure - The <!DOCTYPE> Declaration - Heading Tags - Paragraph Tag - Line Break Tag - Centering Content - Horizontal Lines - Preserve Formatting - Non breaking Spaces.

Unit: II	HTML Elements & Text	5 hours

HTML Elements - HTML Formatting - Bold Text - Italic Text - Underlined Text - Strike Text – Mono spaced Font - Superscript Text - Subscript Text - Larger Text - Smaller Text - Emphasized Text - Marked Text - Strong Text .

Unit: III	HTML Comments & Image	5 hours

HTML Comments - Valid Vs Invalid Comments - Multiline Comments - HTML Images - Insert Image - Set Image Location - Set Image Width/Height - Set Image Border - Set Image Alignment.

Unit: IV	HTML Links	5 hours

HTML Text Links - Hyperlinks - Linking Documents - The target Attribute - Setting Link Colors HTML .

Unit: V	HTML Lists	5 hours

HTML Lists - HTML Unordered Lists - The type Attribute for Unordered Lists - HTML Ordered Lists - The type Attribute for Ordered Lists - The start Attribute HTML Definition Lists.

Total Lecture Hours	**25 hours**

TEXT BOOKS

1	https://www.tutorialspoint.com/html

REFERENCE BOOKS

1	*C.Xavier*, "World wide web design with HTML", Tata McGraw Hill, 2nd Reprint 2000.
2	*Andy Holyer*, "HTML in easy steps", Dream Tech Press, 2001.

WEB REFERENCES

1	https://www.w3schools.com/html/
2	https://www.w3.org/standards/webdesign/htmlcss

ASSIGNMENTS	
1	Create an HTML document which consists of: I. Ordered List II. Unordered List III. Nested List IV. Image
2	Create an HTML document which implements Internal linking as well as external linking.
3	Create an HTML document with the following formatting options: I. Bold II. Italics III. Underline IV. Headings (Using H1 to H6 heading styles) V. Font (Type, Size and Color) VI. Background (Colored background/Image in background) VII. Paragraph VIII. Line Break IX. Horizontal Rule X. Pre tag
Case Study	
1	Website Design and Development Using HTML
Course Designed By	
Dr. M.Malathi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	L	L	L	L	L	L	S	L	L	L
CO2	M	M	M	M	M	L	S	L	M	L
CO3	L	M	L	L	M	L	S	M	M	L
CO4	M	M	M	M	S	L	S	M	M	L
CO5	M	S	M	S	S	L	S	M	S	L

S - Strong **M**- Medium **L**- Low

SEMESTER - IV						
Course Code	**21UCS04**	**WEB TECHNOLOGY**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - IV**	**5**	**0**	**0**	**5**
Pre-requisite		Web site Design and Development	**Academic Year 2021-2022**			

Course Objectives:

- To attains a basic knowledge about HTML and its tags.
- Ability to identifying the basic suitable tags and CSS styles to design web pages.
- To learn about the language of the web: HTML and CSS.
- To understand the basic JavaScript syntax and structures.
- To understand the basic tools and applications used in web publishing.

Expected Course Outcomes:

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

CO1	Describe the concepts of WWW including browser and HTTP protocol.	K1/K2/K4
CO2	List the various HTML tags and use them to develop the user friendly web pages.	K2/K3/K4/ K5
CO3	Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications.	K2/K3/K4/ K5
CO4	Gain knowledge of client side scripting using java script.	K2/K3/K4/ K5
CO5	Be able to embed web technology concept to create social media content into web pages.	K2/K3/K4/ K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	**Web Essentials**	**12 hours**

The World Wide Web-HTTP Request Message: Overall Structure, Request-URI, Request Method-HTTP Response Message-Web Clients-Web Servers.

Unit: II	**HTML**	**12 hours**

Basic HTML, Formatting and Fonts, commenting Code – Color – Hyper link – Lists – Table – Images – Simple HTML forms – Frames – Frame sets – Audio / Video.

Unit: III	**Style Sheets**	**12 hours**

CSS-Introduction to Cascading Style Sheets-Features- Syntax – Colors – Fonts - Border – Box.

Unit: IV	**Client- Side Programming**	**12 hours**

Introduction JavaScript -Syntax Variables and Data Types-Statements- Operators- Literals-Functions-Objects-Arrays-Built-in Objects-JavaScript Debuggers.

Unit: V	**Java Server Pages**	**12 hours**

Introduction to Java Server Pages-Running JSP Applications-Basics JSP-JavaBeans Classes and JSP-Tag Libraries and Files-Support for the Model-View-Controller Paradigm.

	Total Lecture hours	**60 hours**

TEXT BOOKS

1	*Jeffery C. Jackson*-"Web Technologies", Pearson, 2012.
2	*Xavier, C*, "Web Technology and Design", New Age International,2011.

REFERENCE BOOKS	
1	*Laura Lemay, Rafe Colbum ,JennifierKymin*-"Mastering HTML,CSS,&JavaScript",BPBPublication,2016.
2	*Ralph Moseley, M.T Savaliya*-"Developing Web Application", Wiley India,2013.
3	*Deitel, Deitel, Goldberg,* "Internet & World Wide Web How to Program", Third Edition, Pearson Education, 2006.
4	*U. K. Roy,* - "Web Technologies", Oxford Higher Education,2003.
WEB REFERENCES	
1	https://www.w3schools.com/css
2	https:// tutorialspoint.com/html
3	www.apachefriends.org
4	https://www.w3.org/standards/webdesign/htmlcss
ASSIGNMENTS	
1	Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work.
2	Design a web page using Java Script and CSS to display the days on which your birthday falls on next 20years.
3	Develop a web based application for online purchasing of products with payment facility.
Course Designed By	
Dr.D.Chitra	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**M**	**M**	**S**	**M**	**S**	**L**	**S**	**M**	**M**	**M**
CO2	**M**	**M**	**S**	**M**	**S**	**L**	**S**	**M**	**S**	**M**
CO3	**M**	**M**	**S**	**S**	**S**	**L**	**S**	**M**	**S**	**S**
CO4	**M**	**S**	**S**	**S**	**S**	**L**	**S**	**S**	**S**	**S**
CO5	**M**	**S**	**S**	**M**	**S**	**L**	**S**	**S**	**S**	**S**

S– Strong; **M**- Medium;**L**- Low

SEMESTER - IV						
Course Code	**21UCSP4**	**WEB TECHNOLOGY LAB**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - IV**	**0**	**0**	**3**	**3**
Pre-requisite		Knowledge on programming language	**Academic Year 2021-2022**			

Course Objectives:

- To create more HTML documents with scripting languages
- To develop web based application using suitable client side technologies.

Expected Course Outcomes:

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

CO1	Ability to design and implement a basic website.	K1/ K2/K3
CO2	Create web pages using HTML and CSS and understand the implementation of various style tags.	K4/K5/K6
CO3	Apply Programming skills to develop various programs using Java script.	K2/K3/K4
CO4	Understand and know how to use web programming languages.	K2/K3
CO5	Effectively use client-side technologies (HTML, CSS and Java Scripts) to implement static websites.	K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Practical 1		**3 hours**

Design a page that has one input, which can take multi-line text and a submit button. Once the user clicks the submit button, it should show the number of characters, words and lines in the text.

Practical 2		**3 hours**

Design a page that contains a selection box with a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

Practical 3		**3 hours**

Write a JavaScript to demonstrate simple calculator.

Practical 4		**3 hours**

Write a JavaScript to find age of a person by getting DOB as input.

Practical 5		**3 hours**

Write a JavaScript code block using arrays and generate the current date in words, this should include the day, month and year.

Practical 6		**3 hours**

Demonstrating different JavaScript Objects such as Window, Navigator, History, Location, and Document.

Practical 7		**3 hours**

Validate the Registration, user login and payment by credit card pages using JavaScript.

Practical 8		**3 hours**
Write a HTML page including any required JavaScript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.		
Practical 9		**3 hours**
Write a JavaScript code that displays text "TEXT-GROWING" with increasing font size in the interval of 100ms in RED COLOR, when the font size reaches 50pt it displays "TEXT-SHRINKING" in BLUE color. Then the font size decreases to 5pt.		
Practical 10		**3 hours**
Create a form for Employee information. Write JavaScript code to find DA,HRA ,PF,TAX, Gross pay, Deduction and Net pay.		
	Total Practical hours	**30 hours**
Course Designed By		
Dr.D.Chitra		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO8	PSO 9	PSO1 0
CO1	**M**	**S**	**L**	**L**	**S**	**L**	**S**	**M**	**M**	**L**
CO2	**M**	**S**	**L**	**M**	**S**	**L**	**S**	**M**	**M**	**L**
CO3	**S**	**S**	**M**	**S**	**M**	**M**	**M**	**L**	**L**	**L**
CO4	**M**	**S**	**M**	**M**	**S**	**L**	**S**	**M**	**L**	**M**
CO5	**L**	**L**	**M**	**M**	**S**	**L**	**S**	**M**	**L**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - IV

Course Code	21UCSS2	IMAGE EDITING TOOL	L	T	P	C
~~Core/Elective~~/Supportive		SKILL ENHANCEMENT COURSE - II	0	0	2	2
Pre-requisite		Knowledge on GUI interaction	Academic Year 2021-2022			

Course Objectives:

- To develop skills to design various types of art work in digital format.
- To deliver skills that support the organization's strategic goals.

Expected Course Outcomes:

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

CO1	Understand and design a business logo, a flyer using template and components.	K1/ K2/K3
CO2	Acquire skill set to develop video ad and animate pages with graphical images.	K4/K5/K6
CO3	Expose the creativity for designing certificate and calendar.	K3/K4/K6
CO4	Apply the knowledge gained in designing a website and visiting card for business.	K2/K3/K6
CO5	Ability to develop calligraphy and natural art using system.	K3/K4/K5/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Practical 1 & 2	**Design features of Text effect and Blending effects**	**4 hours**
1. Design a Greeting Card for Birthday using different text effects. 2. Apply various filter and blending effects to an Image.		
Practical 3 & 4	**Design to develop image dissection using clone tools**	**4 hours**
3. Create a Pattern using Pattern Stamp Tool and Clone Stamp Tool. 4. Create Plastic Surgery for the Nose.		
Practical 5 & 6	**Design to learn Inking and Line art**	**4 hours**
5. Design an art form of any object to implement inking and line art. 6. Draw a face of a human using GIMP.		
Practical 7 & 8	**Design masking and cutting images**	**4 hours**
7. Implement quick mask using GIMP. 8. Do layer mask using GIMP.		
Practical 9 & 10	**Design various types of filters**	**4 hours**
9. Design text effect using GIMP. 10. Implement Lighting and shading in GIMP.		
	Total Practical hours	**20 hours**

Course Designed By

Mr.V. Vincent Arokiam Arul Raja

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	L	S	L	L	S	L	L	L	M	M
CO2	L	S	L	L	S	L	L	L	M	M
CO3	L	S	L	M	S	L	L	L	M	M
CO4	L	S	L	M	S	L	L	L	M	M
CO5	L	S	L	S	S	L	L	L	M	M

S-Strong; **M**- Medium; **L**-Low

SEMESTER - IV

Course Code	21UCSN2	WEB DESIGN : ADVANCED	L	T	P	C
~~Core/Elective~~/Supportive		NON-MAJOR ELECTIVE COURSE -II	2	0	0	2
Pre-requisite		Knowledge on HTML & CSS	Academic Year 2021-2022			

Course Objectives:

- To provide basic idea on create a table within a web page.
- To provide insight on various elements of HTML.
- To acquire knowledge about CSS font , Text, Border & Margin.
- To prepare the students for developing web page using HTML & CSS.

Expected Course Outcomes:

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

CO1	Understand the concept of HTML Tables.	K1/K2
CO2	Apply various style sheets in CSS.	K2/K3
CO3	Understand and Apply various colors and background style concepts with CSS.	K2/K3
CO4	Demonstrate different font & text with CSS	K3/K4
CO5	Develop the concept of various borders & Margin and to create a Web Pages using HTML & CSS	K4/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	HTML Tables	5 hours

Table Heading - Cell padding and Cell spacing Attributes - Col span and Row span Attributes - Tables Backgrounds - Table Height and Width - Table Caption.

Unit: II	HTML Styles - CSS	5 hours

HTML & CSS Style Sheet - CSS Syntax - CSS in three ways - External Style Sheet - Internal Style Sheet - Inline Style Sheet.

Unit: III	CSS Colors & Backgrounds	5 hours

CSS Colors : Background color – Text Color – Border Color – RGB Colors - HEX Colors - HSL Colors.

CSS Backgrounds : Background Image – Background Repeat – Background Size – Background attachment

Unit: IV	CSS Font & Text	5 hours

CSS Font : Font family - Font size – Font style – Font Variant – Font Weight.

CSS Text : Text Direction – Text align – Text Declaration – Text Shadow – Text Transform

Unit: V	CSS Border & Margin	5 hours

CSS Border : Border Color – Border width – Border Style - Border Shorthand.

CSS Margin : Margin Bottom – Margin left – Margin right – Margin top – Margin Collapse.

	Total Lecture hours	25 hours

TEXT BOOKS

1	https://www.w3schools.com/html/

REFERENCE BOOKS

1	*C.Xavier*, "World wide web design with HTML", Tata McGraw Hill, 2nd Reprint 2000.
2	*Andy Holyer*, "HTML in easy steps", Dream Tech Press, 2001.
3	*Mike McGrath*, "CSS in easy steps", 4 th edition , January 2020.

WEB REFERENCES	
1	https://www.tutorials.pointcom/html/
2	https://www.w3.org/standards/webdesign/htmlcss
ASSIGNMENTS	
1	Design a Webpage using tables
2	Design a Webpage using forms
3	Design a web page with internal and external style sheets.
4	Design text effects using CSS.
Case Study	
1	Website Design and Development Using HTML & CSS
Course Designed By	
Dr. M.Malathi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	L	L	L	L	L	L	S	L	L	L
CO2	M	M	M	M	M	L	S	L	M	L
CO3	L	M	L	L	M	L	S	M	M	L
CO4	M	M	M	M	S	L	S	M	M	L
CO5	M	S	M	S	S	L	S	M	S	L

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCS05**	**COMPUTER ORGANIZATION & ARCHITECTURE**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE -V**	**5**	**0**	**0**	**4**
Pre-requisite		Understand Functional units of a Computer system	**Academic Year 2021-2022**			

Course Objectives:

- To built an extensive knowledge on the basic applications and the components ofcomputer.
- To study the number systems and binary codes.
- To learn about digital logic gates and Boolean algebra.
- To gain knowledge of combinational and sequential circuits.
- To help students in understanding various integrated circuits and registers.
- To familiarize the basics of CPU and I/O interface.

Expected Course Outcomes:

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

CO1	Understand the data representation and work with different number systems.	K1/K2/K3/ K4
CO2	Ability to design logic circuits and simplification techniques	K1/K2/K3/ K4
CO3	Identification of the basic components of combinational and sequential circuits.	K1/K2/K3
CO4	Compare the various types of integrated circuits and registers.	K2/K3/K4
CO5	Demonstrate basic knowledge about CPU and I/O interface	K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit : I	**Number Systems and Binary Codes**	**12 hours**

Number Systems: Binary – octal and Hexa decimal - Conversion – Decimal Representation – Alpha Numeric Representation – Complements – Fixed-point Representation – Integer Representation – Arithmetic addition, subtraction – Decimal fixed point Representation – Floating point Representation – Other Binary Codes: Gray Code – weighted code – excess-3 code – ASCII- EBCDIC – Error Detection Code.

Unit : II	**Digital Logic gates and Boolean Algebra**	**12 hours**

Digital Logic gates: AND, OR, Inverter, NAND, NOR, Exclusive-OR, Universal Gates – Boolean Algebra: Basics Identities of Boolean algebra – Demorgan's Theorem – Map simplification –sum-of-products - Product of sum simplification – Don't Care conditions.

Unit : III	**Combinational and Sequential Circuits**	**12 hours**

Combinational Circuit: Block Diagram of Combinational circuit – Half Adder – Full Adder – Sequential Circuit: SR flip-flop, D flip-flop, JK flip-flop, T-flip-flop, Master-slave flip flop – clocked synchronous sequential circuit – example of a sequential circuit.

Unit : IV	**Integrated Circuits and Registers**	**12 hours**

Integrated Circuits: SSI, MSI, LSI, VLSI, TTL, ECL, MOS, CMOS – Decoders – Encoders – Multiplexers –Registers: Register load –Parallel load - Shift Registers – Bidirectional Shift Registers with parallel load – Binary Counters – Binary counter with parallel load – Memory unit – RAM – ROM – Types of ROMs.

Unit : V	CPU and Input-Output organization	12 hours
Central Processing Unit: General Register organization – Stack organization – Instruction formats – Addressing modes – Input-Output organization: Peripheral Devices – Input-Output Interface – Mode of Transfer.		
	Total Lecture hours	**60 hours**
TEXT BOOKS		
1	*Moris Mano M*, "Computer System Architecture ", Third Edition,Pearson , 2017.	
REFERENCE BOOKS		
1	Sanjay Kumar Suman, Bhayalakshmi L, Porselvi S, "Digital Principles and System Design", AU R Edition, Vijay Nicole Imprints Pvt Ltd, 2017.	
2	*Willaim Stallings*, "Computer Organization and Architecture Designing for Performance", 10th Edition, Pearson, 2016.	
3	*Carl Hamacher,Zvonko Viranesic,Safwat Zaky* "Computer Organization", 5th Edition, McGraw Hill, 2017.	
WEB REFERENCES		
1	https://www.classcentral.com/course/swayam-computer-organization-and-architecture-a-pedagogical-aspect-9824	
2	https://www.youtube.com/watch?v=Ol8D69VKX2k&list= PLBlnK6fEyqRgLLlzdgiTUKULKJPYc0A4q	
3	https://www.youtube.com/watch?v=v4O2cj3Oe0A&list= PLrjkTql3jnm8AcFgkc5TE_yQgeHEuKYrG	
4	https://www.youtube.com/watch?v=M0mx8S05v60&list= PLBlnK6fEyqRjMH3mWf6kwqiTbT798eAOm	
5	https://www.youtube.com/watch?v=oAneKttKjtA&list= PL5Rc9H5eTGY6MHqCKAarxhxqT7nipKgun	
6	https://www.youtube.com/watch?v=e4hiRyyQi0A	
ASSIGNMENTS		
1	Show that Data Representation.	
2	Construct various types of gates using universal gates.	
3	Show that a JK flip-flop can be converted to a D flip-flop with inverter between the J and K inputs.	
4	Identify the IC types.	
5	Draw neat sketch for interfacing techniques with CPU.	
Course Designed By		
Mr.E. Jayabalan		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	S	M	S	S	S	M	L	M	L	M
CO2	S	S	S	S	M	L	L	M	M	L
CO3	S	S	L	M	M	L	L	L	M	M
CO4	M	S	L	S	M	S	M	L	M	M
CO5	M	S	M	M	M	S	L	M	S	M

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCS06**	**VISUAL PROGRAMMING**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE- VI**	**5**	**0**	**0**	**5**
Pre-requisite		Basic Knowledge on Programming Language	**Academic Year 2021-2022**			

Course Objectives:

- To analyze problems and determine their requirements.
- To gain a basic understanding of Database Access & Management using Data Controls.
- To learn about Advanced Data Controls & Data Report.
- Design, formulate, and construct applications with VB.NET.
- Integrate variables and constants into calculations applying VB.NET.

Expected Course Outcomes:

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

CO1	Design, Create, build and Debug VB Applications using window Components.	K2/K3
CO2	Apply loop Structures and Menu operations to create manageable code.	K3/K6
CO3	Evaluate different types of Data controls & Data Reports.	K4/K5
CO4	Analyze Program Requirements.	K3/K4
CO5	To build windows Applications using Structured and object-based Programming techniques in VB.Net	K4/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Working with Window Components , Forms, Controls**	**12 hours**

Components: Menu Bar, Standard Tool Bar, Project Explorer Window, Form layout window, Properties window, Tool Box, Code Editor window, Object Browser. Forms: Properties, Events, Methods. Controls – Variables – Data Types – Constants.

Unit: II	**Statements , Arrays , Database Handling**	**12 hours**

Arrays - Decision Structure – Loop structure – Menus: Creating, Adding menu items , Creating Shortcut , Adding separator Bars. Database Handling: Creating and access the database by using the Data Control.

Unit: III	**Data Control , Errors , Data Reports**	**12 hours**

Using ADO Data control – Working with Advanced Data Controls: Data List Control – Data Combo Control - - Data Grid Control – MSH Flex grid Control. Errors: Runtime, Trapping , Handling errors. Data Environment and Data Report: SQL Query Builder, Data Report.

Unit: IV	**.NET framework and VB.NET**	**12 hours**

Introduction – Evolution of the .NET framework – Overview of the .NET framework – DLL,COM, COM+, DCOM and Assemblies – Variable Declaration and Initialization – Value Data Types – Reference Data Types – Arithmetic Operators – Control Statements.

Unit: V	**Inheritance , Polymorphism , Exception Handling**	**12 hours**

Methods and Arrays – Definition and usage of a class, Inheritance and Polymorphism – Interfaces and Name spaces – Delegates and Events – Exception Handling.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	***Soma Dasgupta***, "Visual Basic – to Advance", BPB Publications
2	***C.Muthu***, "Visual Basic .Net", McGraw – Hill Education (India) Pvt. Ltd.
REFERENCE BOOKS	
1	***Mohammed Azam***," Programming with Visual Basic 6.0", 2nd Edition.
2	***Deitel&Deitel***, Visual Basic 6 How to Program, Pearson Education.
3	***P.Radnaganesan,Scitech***," VB.NET" publications India Pvt Ltd, 2008
WEB REFERENCES	
1	https://www.tutorialspoint.com/vb.net/vb.net_web_programming.htm
2	http://www.cs.uni.edu/~fienup/cs030s09/lectures/
3	https://en.wikipedia.org/wiki/Visual_programming_language
4	https://docs.microsoft.com/en-us/dotnet/visual-basic/language-reference/
5	http://people.stfx.ca/rpalanis/131/lecture_notes/VB/
ASSIGNMENTS	
1	Branching & Looping
2	Menu & Submenu
3	ADO & DAO Control
4	VB.Net Control Statements
5	Object Oriented Programming Concept using VB.Net
Course Designed By	
Dr. M.Malathi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**M**	**M**	**L**	**M**	**S**	**L**	**L**	**M**	**L**	**L**
CO2	**M**	**M**	**L**	**M**	**S**	**L**	**L**	**M**	**M**	**L**
CO3	**M**	**M**	**M**	**M**	**S**	**M**	**L**	**M**	**M**	**L**
CO4	**L**	**M**	**L**	**L**	**M**	**L**	**L**	**M**	**L**	**L**
CO5	**M**	**M**	**L**	**M**	**M**	**L**	**L**	**M**	**L**	**L**

S - Strong **M**- Medium **L**- Low

SEMESTER - V

Course Code	21UCS07	RELATIONAL DATABASE MANAGEMENT SYSTEMS	L	T	P	C
Core/~~Elective/Supportive~~		CORE COURSE - VII	5	0	0	5
Pre-requisite		Knowledge on Data structures and Algorithms	Academic Year 2021-2022			

Course Objectives:

- Discuss the basic concepts and the applications of database systems.
- To evaluate normalization, relational algebra and relational calculus
- Enhanced the knowledge in the area of Structured Query Language.
- To identify the major challenges in Database security, concurrency control and backup recovery.
- To know the Distributed databases system, Hierarchical and network databases.

Expected Course Outcomes:

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

CO1	Understand the basic concepts and technologies used in the field of database systems.	K1/K2/K4/K5
CO2	Evaluate the role of the major types of relational algebra and calculus based on the Relationship of Transaction Parties.	K2/K3/K5/K6
CO3	Analyze the use of structured Query Language.	K2/K3/K4
CO4	Understand the role of database security, backup recovery and database security.	K2/K3/K4/K5
CO5	Learned the need of Distributed database system, Hierarchical and network databases.	K2/K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	Introduction to DBMS	12 hours

Introduction to Database Management Systems: Benefits of using DBMS – Functions of DBMS – Components of a DBMS. **Database Architecture and Design**: Data Abstraction – Physical and Logical Data Independence. **Data Models**: Hierarchical Model – Network Model – Relational Model – E-R Model – Object-oriented Model. **Entity-Relationship (E-R) Modeling:** Components of an E-R Model – E-R Diagram Conventions – Relationships-Relational Database Management Systems (RDBMS).

Unit: II	Data Normalization	12 hours

Data Normalization: What is Normalization? – Keys – Relationships – First Normal Form – Second Normal Form – Third Normal Form – Boyce-Codd Normal Form (BCNF). **Relational Algebra**: Relational Algebraic Operations: Union, Intersection and Difference – Cartesian Product-Select – Project – Assignment – Division – Rename –Join. **Relational Calculus:** Tuple Relational Calculus – Domain Relational Calculus.

Unit: III	Structured Query Language	12 hours

Structured Query Language (SQL): Advantages of SQL – Types of SQL Commands – Arithmetic Operators – Comparison Operators – Logical Operators – Set Operators-**Tables and Views**. **Queries**: Select – WHERE clause – GROUP BY clause – HAVING clause – ORDER BY clause – Sub queries – Aggregate Functions–Insert, Update and Delete Operations-Joins and Unions.

Unit: IV	Database Security	12 hours

Database Security: Data Security Risks – Data Security Requirements – Granting and Revoking Privileges and Roles. Transaction Management and Concurrency Control: Transaction Properties – Transaction States – Concurrency Control – Transaction Management in SQL. Backup and Recovery: Database Backups – Causes of Failures – Recovery Concepts and Terminology.

Unit: V	Distributed Databases	12 hours
Distributed Databases: Architecture – Homogeneous and Heterogeneous Distributed Databases – Distributed Data Storage – Advantages and Disadvantages of Distributed Databases. **Hierarchical and Network Databases**.		
	Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Alexis Leon, Mathews Leon*, "Essentials of Database Management Systems", Vijay Nicole Imprints Pvt. Ltd., Second Reprint 2009.
REFERENCE BOOKS	
1	*AviSilberschatz,HenryF.Korth,S.Sudarshan*,"DatabaseSystemConcepts", McGraw- Hill, 6th edition.
2	*NileshShah* ,"Database Systems Using Oracle", Pearson, 2ndedition.
WEB REFERENCES	
1	https://www.w3schools.in/dbms/
2	http://www.db-book.com/
3	https://www.w3schools.com/SQL/
4	https://www.tutorialspoint.com/sql/
ASSIGNMENTS	
1	Entity-Relationship (E-R)Modeling
2	Data Normalization
3	Aggregate Functions in SQL, Tables and Views
4	Database Security
Course Designed By	
Dr.D.Chitra	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**L**	**M**	**S**	**M**	**S**	**M**	**L**	**S**	**M**	**L**
CO2	**L**	**M**	**S**	**M**	**S**	**M**	**L**	**S**	**M**	**L**
CO3	**L**	**S**	**S**	**M**	**S**	**M**	**M**	**S**	**S**	**M**
CO4	**L**	**S**	**S**	**M**	**S**	**M**	**M**	**S**	**S**	**L**
CO5	**L**	**S**	**S**	**M**	**S**	**M**	**M**	**S**	**S**	**L**

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSM1**	**SOFTWARE ENGINEERING**	**L**	**T**	**P**	**C**
~~**Core**~~/**Elective**/~~**Supportive**~~		**MAJOR BASED ELECTIVE - I**	**5**	**0**	**0**	**4**
Pre-requisite		Understand the basic information about Software, Project descriptions	**Academic Year 2021-2022**			

Course Objectives:

- To provide an idea for decomposing a problem using analysis, design, implementation, testing and maintenance phases.
- To know the various phases in software development and the tools available for software engineering.
- To provide insight on software engineering discipline and the processes of software development.
- To provide an idea for designing process models for various problems.
- To gain knowledge about the implementation of software quality issues.

Expected Course Outcomes:

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

CO1	analyze, design, verify & validate, implement and maintain software systems.	K1/K2/K4
CO2	use the techniques, skills and Computer aided software engineering tools.	K1/K2/ K3/K5
CO3	Design applicable solution in one or more applications domains using software engineering approaches that integrate ethical, social, legal, and economics concerns.	K1/K2/K4
CO4	expertise in designing, evaluating, and adapting software processes to meet the needs of an advanced development project;	K1/K2/K3/K4/ K5
CO5	acquire skills in identifying and solving user needs and designing an effective software solution	K2/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	**Software and Software Engineering**	**12 hours**

The Nature of Software-The Software Process. **Process Models**: A Generic Process Model-Defining a framework activity-Prescriptive Process Models.

Unit: II	**Recommended Process Model**	**12 hours**

Requirements Definition-Preliminary Architectural Design-Resource Estimation-First Prototype Construction- Prototype Evaluation. **Human aspects of Software Engineering**: Characteristics of a Software Engineer - The Psychology of Software Engineering - The Software Team- Team structure.

Unit: III	**Requirements Modeling**	**12 hours**

Requirements Analysis- Scenario-based modeling-Class based modeling-Functional modeling-Behavioral modeling. **Design concepts**: The Design Process-Design Concepts-The Design Model.

Unit: IV	**Quality and Security**	**12 hours**

What is Quality? - Software quality-The software quality dilemma-Achieving software quality. **Software Quality Assurance**: Elements of Software Quality Assurance- SQA tasks-Goals and Metrics-Formal Approaches to SQA- Statistical Software quality assurance-Software reliability.

Unit: V	**Software Testing**	**12 hours**

Software Testing Fundamentals-Integration Testing-Artificial Intelligence and Regression Testing-Validation Testing. **Software metrics and analysis**: Software measurement-Software analytics-product metrics-metrics for testing-metrics for maintenance-metrics for software quality.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	Software Engineering-A Practitioner's Approach - Ninth Edition - Roger. S. Pressman, Bruce R. Maxim. MCGraw Hill Publishing Company.
REFERENCE BOOKS	
1	*Richard Fairley*, "software Engineering Concepts" TMH edition, 21st reprint 2005.
2	*Rajib Mall*, "Fundamentals of software engineering" PHI, Third Edition.
WEB REFERENCES	
1	https://www.tutorialspoint.com/software_engineering/index.htm
2	https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-355j-software-engineeringconcepts-fall-2005/lecture-notes/
3	http://nptel.ac.in/downloads/106105087/
ASSIGNMENTS	
1	Software Requirements
2	Software design
3	Software Coding and Testing
Course Designed By	
Mr. M. Thangavel	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**M**	**S**	**M**	**S**	**M**	**M**	**M**	**S**	**M**
CO2	**M**	**S**	**M**	**S**	**M**	**M**	**L**	**M**	**M**	**L**
CO3	**M**	**S**	**L**	**M**	**M**	**L**	**M**	**M**	**M**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**S**	**M**	**L**	**M**	**M**
CO5	**M**	**S**	**M**	**M**	**M**	**S**	**L**	**M**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSM2**	**OPEN SOURCE TECHNOLOGY**	**L**	**T**	**P**	**C**
~~Core~~/Elective~~/Supportive~~		**MAJOR BASED ELECTIVE - II**	**5**	**0**	**0**	**4**
Pre-requisite		Knowledge of programming language	**Academic Year 2021-2022**			

Course Objectives:

- To introduce open source methodologies.
- To expose Students to free Open source software environment and introduces them to use open source packages.
- For Study the problems with traditional commercial software.
- To Learn Open source web server, software tools.
- To understand the basic concept of open source ethics and shared software.

Expected Course Outcomes:

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

CO1	Ability to gather information about free and open source software.	K1/K2/K4
CO2	Understand the installation of various packages in open source software packages.	K2/K3/K4/K6
CO3	Understand Various version control systems.	K2/K3/K4/K5
CO4	The students will be familiar with working of different web servers.	K2/K3/K5
CO5	Learned the need of Open source technology, open source development model, applications of open sources, and shared software.	K2/K3/K4/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	**Introduction**	**12 hours**

Introduction: open Source, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean any cost. History: BSD, The Free Software Foundation and the GNU Project.

Unit: II	**Open Source History**	**12 hours**

Open Source History, Initiatives, Principle and methodologies. Philosophy : Software Freedom, Open Source Development Model Licenses and Patents: What Is A License, Important FOSS Licenses (Apache, BSD,GPL, LGPL), copyrights and copy lefts, Patents Economics of FOSS : Zero Marginal Cost, Income-generation opportunities, Problems with traditional commercial software, Internationalization.

Unit: III	**Community Building**	**12 hours**

Community Building: Importance of Communities in Open Source Movement-JBoss Community-Starting and Maintaining an Open Source Project - Open Source Hardware .

Unit: IV	**Server**	**12 hours**

Apache HTTP Server and its flavors- WAMP server (Windows, Apache, MySQL, PHP)-Apache, MySQL, PHP, JAVA as development platform.

Unit: V	**Open Source**	**12 hours**

Open source vs. closed source Open source government, Open source ethics. Social and Financial impacts of open source technology, Shared software, Shared source.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Sumitabha Das* "Unix Concepts and Applications", Tata McGraw Hill Education 2006
2	*KailashVedera, Bhavyesh Gandhi,* "Open Source Technology", University Science press, ker
REFERENCE BOOKS	
1	*Paul Kavanagh*, "Open Source Software: Implementation and Management", Elsevier Digital Press
2	*Michael Bazzell*-"Open Source Intelligence Collection and Analysis", Create space Independent publishing platform 2018.
WEB REFERENCES	
1	https://www.w3schools.com/wamp
2	https:// tutorialspoint.com/html
3	www.apachefriends.org
ASSIGNMENTS	
1	Open source principles and methodologies.
2	Open source software benefits and features.
3	Open source Software installation procedures.
Course Designed By	
Dr.D.Chitra	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**L**	**M**	**L**	**M**	**S**	**L**	**M**	**S**	**M**	**M**
CO2	**L**	**M**	**L**	**M**	**S**	**L**	**M**	**S**	**M**	**M**
CO3	**L**	**S**	**M**	**M**	**S**	**L**	**S**	**S**	**S**	**M**
CO4	**L**	**S**	**M**	**M**	**S**	**L**	**S**	**S**	**S**	**M**
CO5	**L**	**S**	**M**	**M**	**S**	**L**	**S**	**S**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSM3**	**MULTIMEDIA SYSTEMS**	**L**	**T**	**P**	**C**
~~**Core/**~~**Elective**~~**/Supportive**~~		**MAJOR BASED ELECTIVE - III**	**5**	**0**	**0**	**4**
Pre-requisite		Basic knowledge on 2D and 3D Animation	**Academic Year 2021-2022**			

Course Objectives:

- To learn the basics and Fundamentals of Multimedia.
- To introduce Multimedia Components and Tools.
- To train and develop the Multimedia Projects.
- To Understand how Multimedia can be Incorporated.

Expected Course Outcomes:

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

CO1	Understand the basic concepts & Tools of Multimedia	K1/K2
CO2	Apply the concept of Graphics and Images in Various Kinds Media	K2/k3
CO3	Analyze the different types of Animation techniques in developing Software Applications.	K3/K4
CO4	Evaluate the Various File Formats and Compression techniques	K4/K5
CO5	Use appropriate design to develop Multimedia Projects.	K5/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Multimedia Overview**	**12 hours**

Introduction to Multimedia: What is Multimedia – A Concise History of Multimedia – Combining content from Various Media - Linear vs. Interactive Multimedia – The purposes and Applications of Multimedia: Why and how Multimedia is used – Planning stage and Development Process – Tools for Creating and Preparing Media.

Unit: II	**Kinds of Media**	**12 hours**

Graphics and Images: The Role of Graphics and Images in Multimedia – Designing Vector Graphics – Creating Raster Images – Color theory – Text and Typography: Text defined – Typing , Texting and E-mailing –Typography.

Unit: III	**2D and 3D Animation**	**12 hours**

2D and 3D animation: Animation in multimedia – Kinds of Animation – Traditional Animation overview-Principles of animation-Differences between 2D and 3D Animation – Animation files and formats..

Unit: IV	**Audio**	**12 hours**

Audio Fundamentals – Recording vs. Importing Sound – MIDI and Digital Music -Editing and Manipulating Audio Tracks – Audio File Formats and Compression Schemes – Audio File Types.

Unit: V	**Video**	**12 hours**

Video mechanics – Video in Multimedia – Analog and Digital Video – Shooting and obtaining video – video compression schemes and file formats – Authoring for multimedia functionality: Tools for authoring – Interactive Design.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Jennifer Coleman Dowling*, "Multimedia Demystified", Tata McGraw Hill, Edition 1, 2011.
REFERENCE BOOKS	
1	*Robert Reinhardt, Snow Dowd*, "Macromedia Flash8 Bible", Wiley Publishing Inc., Edition I, 2006.
2	*Tay Vaughan* , "Multimedia Making it work"– Sixth Edition –Tata Mc-GrawHill- 2004.
3	*Malay Pakhira. K* , "Computer Graphics, Multimedia and Animations, second Edition , PHI 2010.
WEB REFERENCES	
1	https://nptel.ac.in/courses/Webcoursecontents/.../Multimedia%20 Processing/ New_index1.html
2	https://www.sanfoundry.com/best-reference-books-multimedia-applications
3	http://www.teleport.com/~cooler/MMMM/making/gif/up.html
4	http://www.w3.org/Graphics/
5	http://webreference.com/dev/graphics/tools.html
ASSIGNMENTS	
1	Tools for creating and preparing media.
2	Animation files and formats.
3	Tools for authoring.
4	Editing and Manipulating Audio Tracks
5	Compression Schemes and File Formats.
Course Designed By	
Dr.M.Malathi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**M**	**S**	**L**	**M**	**S**	**L**	**L**	**L**	**M**	**L**
CO2	**S**	**S**	**L**	**S**	**M**	**L**	**L**	**M**	**M**	**L**
CO3	**S**	**S**	**L**	**S**	**S**	**L**	**L**	**M**	**M**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**L**	**L**	**L**	**L**	**L**
CO5	**S**	**S**	**L**	**S**	**S**	**L**	**L**	**M**	**L**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSM4**	**COMPUTER GRAPHICS**	**L**	**T**	**P**	**C**
~~**Core**~~/**Elective**/~~**Supportive**~~		**MAJOR BASED ELECTIVE -IV**	**5**	**0**	**0**	**4**
Pre-requisite		Mathematical Foundation and Image Basics	**Academic Year 2021-2022**			

Course Objectives:

- To Understand the basic concepts of Computer Graphics.
- To Understand the importance of Raster and Random Scan Systems Video Controller in Image Processing.
- To Apply geometric transformations, viewing and clipping on graphical objects.
- To Understandvisiblesurfacedetectiontechniquesandilluminationmodels.

Expected Course Outcomes:

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

CO1	To understand the Graphics system and functions of various devices associated with the graphics system.	K1/K2/ K4
CO2	To observe the processes behind raster and random scan systems with algorithms in the field of image processing	K1/K2/ K3/K4
CO3	To acquire the knowledge on 2-D geometric transformations.	K1/K2/ K3
CO4	To acquire the knowledge on 3-D geometric transformations.	K1/K2/ K3
CO5	To learn inputs on image processing and apply it into the research	K2/K4/ K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Overview of Graphics Systems**	**12 hours**

Overview of Graphics Systems: Video Display Device-Refresh Cathode – Ray tubes Raster - Scan Displays Random - Scan Displays - Color CRT Monitors -Direct view Storage tubes Flat - Panel Displays Three - Dimensional Viewing Devices, Stereoscopic and Virtual – Reality Systems.

Unit: II	**Raster and Random-Scan Systems Video Controller**	**12 hours**

Raster-ScanSystemsVideoController-Random-ScanSystemsVideoController-Random-Scan Systems-Input device–Keyboard-Mouse-Trackball - Space ball and Joysticks - Data Glove – Digitizers Image Scanners -Touch Panels - Light pens. Voice Systems - Hard-Copy Devices - Line Drawing Algorithms –DDA Algorithms - Circle generating Algorithm Properties of Ellipses.

Unit: III	**Two Dimensional Geometric Transformation**	**12 hours**

Two Dimensional Geometric Transformation: Basic Transformations -Translation-Rotation-Scaling-Matrix Representations and Homogeneous Coordinates-Other Transformations Reflections Two Dimensional Viewing: Windows to viewpoint coordinate Transformations - Clipping Operations -Point Clipping-Line Clipping-Curve Clipping - Text Clipping - Exterior Clipping.

Unit: IV	Three Dimensional Geometric Transformations	12 hours
Three Dimensional Concepts : Three Dimensional Display method- Parallel projection – Depth cueing visible line and surface- Three Dimensional Geometric and modeling Transformations: Translation - Rotation - Scaling -Composite Transformations. Three Dimensional Viewing: Viewing pipeline –Viewing Coordinates-Projections-Parallel Projections- Perspective Projections.		
Unit: V	**Visible Surface Detection Methods**	**12 hours**
Visible Surface Detection Methods: Classification Visible Surface Detection Algorithms - Back Face Detection - Depth - Buffer Method - A-Buffer Method - Scan line method - Depth sorting method - BSP tree method - Area Sub division Method.		
	Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Donald Hearn and M.Pauline Baker*, "Computer Graphics", 2ndEdition, 1996.
REFERENCE BOOKS	
1	*Johnf. Hughes, Andries Van Dam, Morgan Mcguire, David F.Sklar, James D.Foley, Steven K.Feiner, Kurt Akeley,* "Computer Graphics Principles and Practice" 3rdEdition, Pearson Education,2014.
2	*David J. Eck, Hobart and William Smith*," Introduction to Computer Graphics", David J.Eck,2016.
3	*Harrington*, "Computer Graphics", Second Edition, Tata Mecraw Hill
WEB REFERENCES	
1	https://www.geeksforgeeks.org/introduction-to-computer-graphics/
2	https://www.tutorialspoint.com/computer_graphics/index.htm
3	https://ecomputernotes.com/computer-graphics
4	https://edirlei.com/aulas/cg-2021/CG_Lecture_03_Transformations_2021.html
5	https://www.javatpoint.com/computer-graphics-introduction-of-transformations
ASSIGNMENTS	
1	Applications of Graphics
2	Research Perception : 2-D and 3-D Transformation
3	Algorithms on Surface Detection Method
Course Designed By	
Dr. R.Pugazendi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	S	M	L	L	L	S	L	M	L	L
CO2	S	L	L	L	L	L	L	M	L	L
CO3	S	M	L	L	L	L	L	M	L	L
CO4	S	M	L	L	L	L	L	M	L	L
CO5	S	S	M	M	L	M	L	M	L	L

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSP5**	**RDBMS and Visual Programming**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - V**	**0**	**0**	**3**	**3**
Pre-requisite		Knowledge in Database &GUI Application	**Academic Year 2021-2022**			

Course Objectives:

- To Present SQL and procedural interfaces to SQL Comprehensively.
- To give an introduction to systematic database design approaches.
- To give a good formal foundation on the relational model of data.
- To provide design, formulate, and construct applications with Visual Basic.
- To apply the various constraints in Visual Basic

Expected Course Outcomes:

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

CO1	Understand, appreciate and effectively explain the underlying concepts of database technologies.	K2,K3,K5
CO2	Design and implement a database Schema for a given problem domain.	K2,K3,K5,K6
CO3	Programming PL/SQL including stored procedures, stored functions, and cursor packages.	K4,K5,K6
CO4	Understand the Visual Studio IDE and its common features.	K2,K3,K5,K6
CO5	Understand Visual Basic applications and controls.	K1,K4,K5,K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1 — **3 hours**

Create a table **client master** with the following fields client no, name, address1, address2, city, state, pin code, remarks, balance due and implement the following
Create a primary key constraint on the column client no
Insert five rows into the table.
Update the table client master
Add a new column in the table: Age
Remove a column from the existing table.
Changes the existing data type of a column in table using ALTER/MODIFY.

Practical 2 — **3 hours**

Create a table name student with fields of student_id, student name,class,M1,M2,M3, total, average, result, grade and implement the following
Compute total, average, result, grade using formula.
Display all the students with average above90.
Display all the students in class II B.Sc. who have an average value above80.
Display the rank of all the students.
Display the grade wise information for the students.
Display student names that start with 'K'
Select unique student names from the table.

Practical 3	**3 hours**
Create the following table with fields: employee (employee-name, street, city), works(employee-name, company-name, salary), company(company-name, city), manages(employee-name, manager-name) Give an expression in SQL for each of the following queries: Find the names, street address, and cities of residence for all employees who work for 'ABC Corporation' and earn more thanRs.10,000. Find the names of all employees in the database who live in the same cities as the companies for which they work. Find the names of all employees in the database who live in the same cities and on the same streets as do their managers. Find the names of all employees in the database who do not work for 'ABC Corporation'. Assume that all people work for exactly one company. Find the names of all employees in the database who earn more than every employee of 'XYZ Corporation'. Assume that all people work for at most one company. Assume that the companies may be located in several cities. Find all companies located in every city in which 'XYZ Corporation' is located. Find the names of all employees who earn more than the average salary of all employees of their company. Assume that all people work for at most one company. Find the name of the company that has the smallest payroll.	
Practical 4	**3 hours**
Write a PL/SQL to split the student table into two tables based on result (one table for "Pass" and another for "Fail"). Use cursor for handling records of student table. Assume necessary fields and create a student's details table.	
Practical 5	**3 hours**
Write a PL/SQL block to implement the concept of Join	
Practical 6	**3 hours**
Write a VB Program to construct of an Arithmetic Calculator.	
Practical 7	**3 hours**
Develop a Visual Basic Program to simulate the traffic signals, by using following conditions. i) Form consists of three signals RED, YELLOW and GREEN in an order of column wise. ii) Form consists of one timer label, to display the Time out of the signal. iii) While transforming the signal from REG to Green, signal travel to YELLOW signal. iv) Time out for RED signal is 180seconds. v) Time out for Green signal is 120seconds. vi) Time out for YELLOW signal is 60seconds.	
Practical 8	**3 hours**
Design an application to prepare Students Mark Sheet.	

Practical 9	**3 hours**
Write a VB.NET Program using Polymorphism.	
Practical 10	**3 hours**
Write a VB.NET Program using Delegates and Events.	
Total Practical hours	**30 hours**
Course Designed By	
Dr. M.Malathi & Dr.D.Chitra	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**M**	**M**	**S**	**M**	**L**	**L**	**S**	**S**	**M**	**L**
CO2	**M**	**M**	**S**	**M**	**L**	**L**	**S**	**S**	**M**	**L**
CO3	**M**	**M**	**S**	**M**	**L**	**L**	**S**	**S**	**M**	**L**
CO4	**M**	**M**	**M**	**L**	**M**	**L**	**S**	**S**	**L**	**L**
CO5	**M**	**M**	**M**	**L**	**M**	**L**	**S**	**S**	**L**	**L**

S - Strong **M**- Medium **L**- Low

SEMESTER - V						
Course Code	**21UCSS3**	**GRAPHIC DESIGN**	**L**	**T**	**P**	**C**
~~Core/Elective~~/Supportive		**SKILLE ENHANCEMENT COURSE - III**	**0**	**0**	**2**	**2**
Pre-requisite		Creativity and Basic Knowledge on GUI interaction	**Academic Year 2021-2022**			

Course Objectives:

- To develop skills to design various types of art work in digital format.
- To deliver skills that support the organization's strategic goals.

Expected Course Outcomes:

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

CO1	Understand and design a business logo, a flyer using template and components.	K1/ K2/K3
CO2	Acquire skill set to develop video ad and animate pages with music.	K4/K5/K6
CO3	Expose the creativity for designing certificate and calendar.	K3/K4/K6
CO4	Apply the knowledge gained in designing a website and visiting card for business.	K2/K3/K6
CO5	Ability to develop own resume and brochure	K3/K4/K5/ K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1&2	**Design a business logo and a flyer**	**4 hours**
1. Design a business logo with the existing template by modifying the text and color. 2. Design a flyer using the existing template by editing some components.		
Practical 3&4	**Develop a Video ad and Animate pages with music**	**4 hours**
3. Design a video ad for business using an existing template. 4. Animate pages and add music to the animations with multiple pages.		
Practical 5&6	**Design a Certificate and Monthly Calendar with creativity**	**4 hours**
5. Design a Certificate for an event with your college name. 6. Design a monthly calendar for the year 2021.		
Practical 7& 8	**Design a Website and Business card**	**4 hours**
7. Create a website design from existing templates by editing it with your own images. 8. Design a business card on your own without template.		
Practical 9&10	**Develop own Resume and Brochure in digital format**	**4 hours**
9. Create and design your own resume using an existing template. 10. Design a brochure for an event on your own without using the template.		
	Total Practical hours	**20 hours**

Course Designed By

Mr. E.Jayabalan

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**M**	**L**	**L**	**M**	**M**	**L**	**M**	**M**	**M**
CO2	**S**	**M**	**L**	**S**	**S**	**M**	**S**	**M**	**M**	**S**
CO3	**S**	**M**	**L**	**S**	**M**	**M**	**S**	**S**	**M**	**M**
CO4	**S**	**M**	**L**	**M**	**M**	**M**	**L**	**M**	**M**	**M**
CO5	**S**	**M**	**L**	**M**	**L**	**M**	**L**	**M**	**M**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCS08**	**OPERATING SYSTEMS**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - VIII**	**5**	**0**	**0**	**4**
Pre-requisite		Understand basic functional units of a computer system, etc	**Academic Year 2021-2022**			

Course Objectives:

- To understand the basic concepts and function of operating systems
- To understand processes and technical concept of deadlock
- To learn physical and virtual memory.
- To gain knowledge of processor and disk scheduling
- To help students in understanding file systems and case study

Expected Course Outcomes:

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

CO1	Understand the system view , management and computing environments	K1/K2/K4
CO2	Ability to design process state and deadlock avoidance.	K1/K2/ K3/K5
CO3	Analyze various memory management schemes.	K1/K2/K4
CO4	Analyze processor scheduling and disk optimization.	K1/K2/K3/ K4/K5
CO5	Demonstrate files systems in various operating systems.	K2/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit : I	**Introduction and Computing Environments**	**12 hours**

Early History - What operating system do – System: View – Organization – Architecture – Structure – Operations. Management: Process, Memory, Storage and I/O. Computing Environments: Traditional Computing, Mobile Computing, Distributed Systems, Client-Server Computing, Virtualization, Cloud Computing, Real-time Embedded Systems and Open Source Operating Systems.

Unit : II	**Process and Deadlock**	**12 hours**

Process Concept - Process states - Process state transitions – Process Control Block – Interrupt Processing – Deadlock and Indefinite postponement – Introduction – Examples – Necessary conditions – Major areas of Deadlock research – Deadlock prevention, avoidance, detection, recovery.

Unit : III	**Physical and Virtual Memory**	**12 hours**

Real Storage: Storage organization, Management, storage management Strategies Contiguous vs. Non contiguous storage allocation, fixed, variable partition, Multiprogramming. Virtual Storage Organization: Basic concepts paging segmentation – virtual storage management: Page Replacement Strategies

Unit : IV	**Processor and Disk Scheduling**	**12 hours**

Job and Processor Scheduling: Scheduling objectives – Preemptive vs Non-Preemptive Scheduling – Priorities – Deadline Scheduling – FIFO – RR – Quantum Size – SJF – SRT – HRN – Multilevel Feedback Queues. Disk Performance: Seek Optimization.

Unit : V	**File Systems and Case Study**	**12 hours**

File and Database systems: File system - Functions – Data Hierarchy - Blocking and Buffering – File Organization – Case Study: UNIX system – The Shell – The File System.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	*Abraham Silberschatz, Peter Baer Galvin,* Greg Gagne, "Operating System Concept", Ninth Edition, Wiley.
2	*H.M.Deitel*, " Operating Systems", Second Edition, Pearson Education.
REFERENCE BOOKS	
1	*Andrew S. Tanenbaum,* "Modern Operating Systems", 2nd Edition, PHI private Limited, New Delhi, 2008.
2	*William Stallings*, "Operating Systems - Internals & Design Principles",5thEdition, Prentice - Hall of India private Ltd, New Delhi, 2004.
3	*Sridhar Vaidyanathan*, "Operating System", 1st Edition,Vijay Nicole Publications, 2014.
WEB REFERENCES	
1	https://www.os-book.com/OS9/slide-dir/index.html
2	https://pdfslide.net/documents/operating-systems-2nd-edition-by-h-m-deitel.html
3	http://www.csc.villanova.edu/~mdamian/Past/csc8410sp07/
4	https://www.youtube.com/results?search_query=operating+system+history+neso+academy
5	https://www.youtube.com/watch?v=aF2uRmibwco&list= PLrjkTql3jnm9U1tSPnPQWQGIGNkUwBFv- (Education4u)
6	https://www.youtube.com/watch?v=S-qPQiD0vqU&list=PLBMNl-szJPPffhKguMDHb2GW9lnQsBZra
ASSIGNMENTS	
1	Identify the various operating system structure.
2	Process management in Unix
3	Memory Management in Linux
4	Literature survey on Scheduling techniques
5	Comparison of various operating systems in computing environments.
Course Designed By	
Mr. E. Jayabalan	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**M**	**S**	**S**	**S**	**M**	**M**	**M**	**S**	**M**
CO2	**S**	**S**	**S**	**S**	**M**	**M**	**L**	**M**	**M**	**L**
CO3	**S**	**S**	**L**	**M**	**M**	**L**	**M**	**M**	**M**	**M**
CO4	**M**	**S**	**L**	**S**	**M**	**S**	**M**	**L**	**M**	**M**
CO5	**M**	**S**	**M**	**M**	**M**	**S**	**L**	**M**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCS09**	**PROGRAMMING IN JAVA**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - IX**	**5**	**0**	**0**	**5**
Pre-requisite		knowledge of computing fundamentals and programming	**Academic Year 2021-2022**			

Course Objectives:

- To identify Java language components and how they work together in applications.
- To design and program stand-alone Java applications.
- To learn how to design a graphical user interface with Java on completion of the course.
- To learn why Java is useful for the design of desktop and web applications
- To learn Java generics and how to use the Java Collections API.

Expected Course Outcomes:

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

CO1	Understand the fundamentals of Java programming. Choose the right data representation formats based on the requirements of the problem.Apply the specification of syntax rules for numerical constants and variables similarly other data types. Ability to work with textual information, characters and strings.	K2/K3
CO2	Design and develop Java program to evaluate simple expressions and logical operations. Illustrate the control statements to write basic Java programs.Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand. Improve the ability to use conditional statements and loops structures.	K2/K3/K4
CO3	Ability to work with arrays of complex objects. Develop & Implement Java programs with suitable modules to solve the given problem. Identify the usage of arrays, strings, functions, etc. Improve the ability to develop function-oriented programs. Along with understanding of the distinction for passing arguments to/from functions. Modularize the code with functions so that they can be reused.	K2/K3/K4
CO4	Implement different Operations on collection objects. Analyze the features of collection objects in custom programming. Evaluate the importance of web application using Java – AWT components. Improve my understanding of the use of server and client side programming also has improve the ability to use the dynamic memory.	K2/K3/K4
CO5	Learn to create simple web applications in JAVA. Also get knowledge of using GUI Application development in JAVA. Emphasis the ability to impose their graphics knowledge by learning various graphic controls in Java – AWT. Stress to find the various Input and Output steam or byte reader and writer. Import the importance of reading and writing from sequential and random files in JAVA	K2/K3/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit : I	Java Construct and Malleable of operators on variable	12 hours
Java Evolution – Simple Java Program – Java program structure – Java Tokens – Java Statements – JVM – Command Line Arguments – Constants, Variables, and Data Types – Declaring and Giving Values to Variables – Scope of Variables – Symbolic Constants – Type Casting – Standard Default Values - Operators and Expressions: Arithmetic – Relational – Logical - Assignment – Increment and Decrement – Conditional – Operator Precedence - Mathematical Functions.		
Unit : II	**Branching and Looping**	**12 hours**
Decision Making and Branching: Introduction – Decision Making with if Statement – Simple if Statement – The if…else Statement – Nesting of if…else Statement – The else if Ladder – The Switch Statement – The ?: Operator. Decision Making and Looping: Introduction – The While Statement – The Do Statement – The For Statement – Jumps in Loops – Labelled Loops. Classes, Objects and Methods: Introduction – Defining a Class – Methods Declaration – 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.		
Unit : III	**Modularization of Programming using Packages**	**12 hours**
Arrays, Strings and Vectors: One-dimensional Arrays – Creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes. Interfaces: Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables. 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.		
Unit : IV	**Web Application and Multi-Programming**	**12 hours**
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. Applet Programming: Difference Between Applets and Applications – Write Applets - Building Applet code - Applet life cycle - Creating an Executable Applet – Designing a web page – Adding Applet to HTML File – Running the applet – Applet Tags –Passing Parameters to Applets – Aligning the Display – Displaying Numerical values – Getting input from the user.		
Unit : V	**File Handling and Graphic Designing**	**12 hours**
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. ManagingI/O Files in Java: Concept of stream – Stream classes – Byte stream classes – Character stream classes – Using stream – Using the file class – Creation of Files – Reading/Writing characters – Reading/Writing Bytes – Handling Primitive Data types – Concatenating and buffering Bytes - Random access files.		
	Total Lecture hours	**60 hours**

TEXT BOOKS

1	*E. Balagurusamy*, "Programming with Java," 4th Edition, Tata McGraw Hill Publication, New Delhi, 2009.

REFERENCE BOOKS

1	*Herbert Schild*, "Java: The Complete Reference," Ninth Edition, Oracle Press, 2014
2	*RohitKhurana,* "Programming with JAVA", VIKAS Publications, 2014
3	*Gokila*, "Advanced Java Programming", Vijay Nicole Publications, 2014.
4	*Muthu C*, "Essentials of Java Programming", 2nd reprint, Vijay Nicole Publications, 2014.

5	*Muthu C,* "Programming with Java", 2nd Edition, Vijay Nicole Publications, 2014
WEB REFERENCES	
1	https://www.google.com/amp/s/data-flair.training/blogs/java-tutorials-home/%3famp
2	https://www.geeksforgeeks.org/java/
3	https://www.programiz.com/java-programming
4	https://www.tutorialspoint.com/java/index.htm
5	https://www.javatpoint.com/java-tutorial
ASSIGNMENTS	
1	Collection Objects
2	Multi Threading and Array
3	Applets and Graphics Components
Course Designed By	
Mr. V.Vincent Arokiam Arul Raja	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**L**	**M**	**L**	**M**	**M**	**M**	**L**	**M**	**L**	**M**
CO2	**M**	**M**	**L**	**M**	**M**	**M**	**L**	**M**	**L**	**M**
CO3	**M**	**S**	**M**	**M**	**S**	**S**	**S**	**S**	**M**	**S**
CO4	**S**	**S**	**M**	**M**	**S**	**S**	**S**	**S**	**M**	**S**
CO5	**S**	**S**	**M**	**M**	**S**	**S**	**S**	**S**	**M**	**S**

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCS10**	**COMPUTER NETWORKS**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE COURSE - X**	**5**	**0**	**0**	**5**
Pre-requisite		Basic Knowledge on Networking Concepts and Technologies	**Academic Year 2021-2022**			

Course Objectives:

- To learn the Organization of Computer Networks.
- To Understand the different Network Connections.
- To Understand the performance of Network Layers.
- Identify the way protocols currently use in the Internet.
- To acquire knowledge about WWW and Electronic Mail.

Expected Course Outcomes:

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

CO1	Understand the data Communication system and its Components	K1/K2
CO2	Apply the concept of Error Detection and Correction Codes	K2/k3
CO3	Illustrate the importance of Network Layers.	K2/K3
CO4	Analyze the different types of Protocols and their functions within a layer.	K3/K4
CO5	To interpret the concepts of WWW & Network Security	K3/K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Overview**	**12 hours**

Introduction : Data Communications – Networks – Brief History and the Internet – Protocols and standards – The OSI Model - Multiplexing – Transmission Media – Guided Media an Unguided Media.

Unit: II	**Data Link Layer**	**12 hours**

Error Detection and Error Correction : Introduction - Block Coding – Cyclic Codes – Checksum. Data Link Control - Framing – Flow and error Control – Protocols – HDLC – Point-To-Point Protocol.

Unit: III	**Network Layer**	**12 hours**

Logical Addressing : IPv4 Addresses – IPv6 Addresses – Internet Protocol : Inter networking – IPv4 – IPv6 – Delivery – Forwarding - Unicast Routing Protocols – Multicast Routing Protocols.

Unit: IV	**Transport Layer**	**12 hours**

Process – To – Process Delivery – UDP – TCP – SCTP – Data Traffic – Congestion – Congestion Control – Quality of Service.

Unit: V	**Application Layer & Security**	**12 hours**

Name Space – Domain Name Space – Electronic Mail – FTP – WWW and HTTP – Symmetric key Cryptography – asymmetric key Cryptography – Digital Signature .

Total Lecture hours **60 hours**

TEXT BOOKS

1.	*Behrouz A Forouzan*, "Data Communications and Networking", Tata McGrawHill, Fifth Edition, 2013.

Reference Books

1	*Andrew S. Tanenbaum*, "Computer Networks", 4th edition, PHI
2	*AchyutGodbole*, "Data Communication and Networks", 2007, TMH.
3	*Uyless Black* , "Computer Networks: Protocols, Standards, and Interfaces", 2nd ed, PHI

WEB REFERENCES	
1	http://nptel.ac.in/courses/106105081/
2	https://www.tutorialspoint.com/data_communication_computer_network/
3	http://www.sanfoundry.com/computer-networks-question-answers-basics/
4	http://highered.mheducation.com/sites/0072967757/student_view0/index.html
5	http://www.careerride.com/networking-test-quiz.aspx
ASSIGNMENTS	
1	Layers in the OSI model
2	Error detection and correction methods
3	Unicast and multicast routing protocols
4	Congestion Control And QoS
5	Security in the Internet: IPSec, , PGP, VPN, and Firewalls
Course Designed By	
Dr. M.Malathi	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	M	M	L	L	L	S	L	M	L	L
CO2	S	S	L	L	M	S	L	L	M	L
CO3	M	M	L	L	M	S	L	M	L	M
CO4	S	M	L	M	L	S	M	M	L	L
CO5	S	M	L	M	L	S	S	S	L	M

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCSM5**	**INFORMATION SECURITY**	**L**	**T**	**P**	**C**
~~Core~~/Elective/~~Supportive~~		**MAJOR BASED ELECTIVE - V**	**5**	**0**	**0**	**4**
Pre-requisite		Understand basic security threat to Information	**Academic Year 2021-2022**			

Course Objectives:

- To introduce the importance of Information Security.
- To inculcate Legal and ethical issues of Information Security
- To classify various Security Technologies to protect Information against threats.
- To motivate the Systematic Project Management principles to ensure Security in organization.
- To enhance the students in communication, technical and problem solving skills.

Expected Course Outcomes:

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

CO1	Understand the common threats against Information and determine the solutions in the form of security.	K1/K2/K4
CO2	Identify and understand risk and potential security issues	K1/K2/ K3/K5
CO3	Formulate information security and related legal and regulatory issues	K1/K2/K4
CO4	Construct Intrusion detection and Prevention systems and have an expertise to use other security tools.	K1/K2/K3/K4/ K5
CO5	Implement information technology project management systems.	K2/K4/ K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Unit: I	**Information Security**	**12 hours**

Introduction- The history of Information Security - What is Security? - Components of an Information System- The Systems development Lifecycle. **The Need for Security:** Introduction - Threats-Attacks-Compromises to intellectual property.

Unit: II	**Legal, Ethical and Professional Ethics in Information Security**	**12 hours**

Introduction - Law and Ethics in Information Security-International Laws and Local Bodies-Ethics and Information Security-Codes of Ethics at Professional Organizations. **Planning for Security:** Introduction - Information Security Policy, Standards and Practices - Security Education Training and Awareness Program.

Unit: III	**Risk Management**	**12 hours**

Introduction - An overview of Risk Management - Risk Identification - Risk Assessment - Risk Control. Security Technology: Firewalls and VPNs: Introduction - Access Control- Firewalls-Protecting Remote connections.

Unit: IV	**Security Technology: Intrusion Detection, Prevention Systems and other security Tools**	**12 hours**

Introduction: Intrusion Detection and Prevention Systems - Honeypots, Honeynets and padded cell systems. Cryptography: Introduction-Cipher methods - Cryptographic tools.

Unit: V	**Implementing Information Security**	**12 hours**

Introduction - Information security project management- Technical aspects of Implementation - Non-Technical aspects of Implementation. Information Security Maintenance: Introduction - Digital Forensics.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1.	*Michael E.Whitman and Herbert J.Mattord* . 2014. **Principles of Information Security. [Fifth Edition]** Cengage Learning India Private Limited, Delhi.
Reference Books	
1	*Calabrese*. 2006. **Information Security Intelligence: Cryptographic Principles and Applications.** [India Edition]. Thomson Delmar Learning Publications.
2	*Bhaskar, S.M. and Ahson. S.I.* 2008. **Information Security – A Practical Approach**. Narosa Publishing House, New Delhi.
WEB REFERENCES	
1	www.sans.org/security-resources
2	www.securityforum.com
3	www.cte.unt.edu/information-technology
ASSIGNMENTS	
1	Detailed Survey on Major security threats against Information and its consequences.
2	Plan for security by Industries and Institutions.
Course Designed By	
Mr. M.Thangavel	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	M	M	M	S	M	M	M	M	S	M
CO2	M	S	M	S	M	M	L	M	M	L
CO3	M	M	L	M	M	L	M	M	M	M
CO4	M	S	L	S	M	S	M	L	M	M
CO5	M	M	M	M	M	S	L	M	S	M

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCSM6**	**E-COMMERCE**	**L**	**T**	**P**	**C**
~~Core~~/Elective~~/Supportive~~		**MAJOR BASED ELECTIVE - VI**	**5**	**0**	**0**	**4**
Pre-requisite		Web Development	**Academic Year 2021-2022**			

Course Objectives:

- Discuss fundamentals of e-commerce, types, and applications.
- To evaluate the role of the major types of business models based on the Relationship of Transaction Parties.
- Assess the impact of the internet and internet technology on electronic business.
- To identify the major management challenges building and using electronic payment systems.
- Learn strategies for e-commerce, Mobile Commerce and Mobile Information devices.

Expected Course Outcomes:

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

CO1	Understand the basic concepts and technologies used in the field of electronic commerce.	K1/K2/K4/K5
CO2	Evaluate the role of the major types of business models based on the Relationship of Transaction Parties.	K2/K3/K5/K6
CO3	Develop an understanding of how various information systems work together on e- business.	K2/K3/K4
CO4	Understand the role of information systems and electronic payment systems in organizations.	K2/K3/K6
CO5	Learned the need of Technologies for Mobile Commerce and security issues of information systems.	K2/K3/K4/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit: I	**Introduction to Electronic Commerce**	**12 hours**

Introduction to E-commerce :Defining Electronic Commerce – Industry Framework – Types of Electronic Commerce. The Internet and The Access Provider Industry: Internet Service Providers – Internet VS Online Services – Predicting the future of the IAP market.

Unit: II	**World Wide Web Application**	**12 hours**

World Wide Web Applications: Brief History of the web – Why is the web such a Hit? – the Web and the Electronic Commerce – The web and the Intra-Business Commerce – Understanding the Intranet Architecture.

Unit: III	**World Wide Web - Concepts and Technology**	**12 hours**

Concepts and Technology: Overview of the Web Technical Architecture- Interactive Web Applications – Web and Database Integration – Web Software Development Tools – Multimedia Web Extensions.

Unit: IV	**E- Payment Systems**	**12 hours**

Electronic Payment System: Overview of the electronic Payment Technology – Electronic or Digital Cash – Electronic Check – Online Credit Card Based Systems.

Unit: V	**Commerce and Banking**	**12 hours**

Electronic Commerce and Banking: Changing Dynamics in Banking Industry – Home Banking Implementations Approaches – Management Issues in Online Banking. Electronic Commerce and Retailing: Changing Retail Industry Dynamics – Online retailing Success Stories.

Total Lecture hours	**60 hours**

TEXT BOOKS	
1	***Ravi Kalakota and Andrew B. Whinston***, *"Electronic Commerce- A Managers Guide", Pearson Education Sales Division*
REFERENCE BOOKS	
1	***David Whiteley***, *"E-Commerce Strategy, Technologies and Applications", 1st Edition, Tata Mc-Graw-Hill, 2001.*
2	***Kamalesh K Bajaj and Debjani Nag***, *"E-Commerce - The cutting edge of Business", 2nd Edition, Tata McGraw-Hill Education, 2005.*
3	***Alexis Leon and Mathews Leon***, *"Internet for Everyone", 15th Anniversary Edition, Leon Tech world, UBS Publications, 2012.*
4	***RitendraGoel,*** *"e-commerce", New Age International Publishers, 2016.*
WEB REFERENCES	
1	https://www.w3schools.com
2	https:// tutorialspoint.com/e-commerce
3	https:// www.studocu.com/in/documents
ASSIGNMENTS	
1	Emergence of the Internet and advantages of E-Commerce.
2	Traditional Marketing, Online Marketing, E-advertising and E branding.
3	Digital Payment Requirements , Classification of New Payment Systems and Properties of Electronic Cash
Course Designed By	
Dr.D.Chitra	

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**L**	**M**	**L**	**M**	**S**	**L**	**M**	**S**	**M**	**M**
CO2	**L**	**M**	**S**	**M**	**S**	**L**	**M**	**S**	**M**	**M**
CO3	**L**	**S**	**M**	**M**	**S**	**L**	**S**	**S**	**S**	**M**
CO4	**L**	**S**	**S**	**M**	**S**	**L**	**S**	**S**	**S**	**M**
CO5	**L**	**S**	**S**	**M**	**S**	**L**	**S**	**S**	**S**	**M**

S - Strong **M**- Medium **L**- Low

SEMESTER – VI						
Course Code	**21UCSP6**	**JAVA PROGRAMMING**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PRACTICAL - VI**	**0**	**0**	**3**	**3**
Pre-requisite		knowledge of computing fundamentals and programming	**Academic Year 2021-2022**			

Course Objectives:

- To use an appropriate programming environment to code, compile, run and debug JAVA.
- To practice programming in Java
- To understand the principles and concepts of object oriented programming
- To analyzing problems, modeling a problem as a system of objects using JAVA
- To create simple web applications
- To learn GUI Application development in JAVA.
- This course gives the practical training in JAVA programming.
- The competence and the development of small to medium sized application programs that demonstrate professionally acceptable coding

Expected Course Outcomes:

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

CO1	Understand the fundamentals of Java programming. Choose the right data representation formats based on the requirements of the problem.Apply the specification of syntax rules for numerical constants and variables similarly other data types. Ability to work with textual information, characters and strings.	K2/K3
CO2	Design and develop Java program to evaluate simple expressions and logical operations. Illustrate the control statements to write basic Java programs.Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand. Improve the ability to use conditional statements and loops structures.	K2/K3/K4
CO3	Ability to work with arrays of complex objects. Develop & Implement Java programs with suitable modules to solve the given problem. Identify the usage of arrays, strings, functions, etc. Improve the ability to develop function-oriented programs. Along with understanding of the distinction for passing arguments to/from functions. Modularize the code with functions so that they can be reused.	K2/K3/K4
CO4	Implement different Operations on collection objects. Analyze the features of collection objects in custom programming. Evaluate the importance of web application using Java – AWT components. Improve my understanding of the use of server and client side programming also has improve the ability to use the dynamic memory.	K2/K3/K4
CO5	Learn to create simple web applications in JAVA. Also get knowledge of using GUI Application development in JAVA. Emphasis the ability to impose their graphics knowledge by learning various graphic controls in Java – AWT. Stress to find the various Input and Output steam or byte reader and writer. Import the importance of reading and writing from sequential and random files in JAVA. Understand the fundamental concepts of AWT controls, layouts and events. Develop java programs for applets and graphics programming	K2/K3/K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1&2	**Java Construct and Malleable of operators on variable**	**6 hours**
1. Finding area and Perimeter of a circle. Use Scanner class. 2. Determining the order of numbers generated randomly using Random Class.		
Practical 3,4&5	**Branching and Looping**	**6 hours**
3. Write a java program to check vowel or consonant 4. Write a Java program to calculate HCF of Two given numbers using loop 5. Write a java program to count total number of notes in entered amount using loop		
Practical 6,7&8	**Illustrate the use of inheritance and interfaces while creating class**	**6 hours**
6. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle. 7. Write java programs that implement the following a) default constructor b) parameterized constructor c) constructor overloading 8. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.		
Practical 9	**Epitomize the use of multithreading and Exception handling**	**6 hours**
9. Write a Java program using Synchronized Threads, which demonstrates Producer Consumer concept.		
Practical 10,11&12	**File Handling and Graphic Designing**	**6 hours**
10. Write a java program to display the following graphics in an applet window. a. Rectangles b. Circles c. Ellipses d. Arcs e. Polygon 11. Write a java program to create following AWT components: Button, Text files , Checkbox, Choice, and List using containers and layouts. 12. Write java program using AWT component to implement Dialog Box and Menus to working with Colors and Fonts.		
	Total Practical hours	**30 hours**
Course Designed By		
Mr. V.Vincent Arokiam Arul Raja		

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**L**	**L**	**L**	**M**	**M**	**M**	**L**	**M**	**L**	**M**
CO2	**L**	**L**	**L**	**M**	**M**	**M**	**L**	**M**	**L**	**M**
CO3	**M**	**M**	**M**	**S**	**S**	**S**	**S**	**S**	**M**	**S**
CO4	**M**	**M**	**M**	**S**	**S**	**S**	**S**	**S**	**M**	**S**
CO5	**M**	**S**	**M**	**S**	**S**	**S**	**S**	**S**	**M**	**S**

S - Strong **M**- Medium **L**- Low

SEMESTER - VI						
Course Code	**21UCSPR**	**COMPREHENSIVE PROJECT**	**L**	**T**	**P**	**C**
Core/~~Elective/Supportive~~		**CORE PROJECT**	**5**	**0**	**0**	**4**

This paper is introduced in the curriculum with the motive of imparting practical knowledge in the phases of Software Development and Engineering. Hence, the Faculty in-charge for this practical continuously assesses the development process of the software developed by each student.

In the semester examinations, the External and Internal Examiners would assess the quality of the software with various parameters like Problem definition, Form design, Table design, Validation etc..,

SEMESTER - VI						
Course Code	**21UCSS4**	**ANDROID PROGRAMMING**	**L**	**T**	**P**	**C**
~~Core/Elective~~/Supportive		**Skill Enhancement Course - IV**	**0**	**0**	**2**	**2**
Pre-requisite		Knowledge on Mobile Apps	**Academic Year 2021-2022**			

Course Objectives:

- To Install and configure Android application development tools.
- To Design and develop user Interfaces for the Android platform.
- To Save state information across important operating system events.
- To Apply Java programming concepts to Android application development.

Expected Course Outcomes:

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

CO1	Create the App to display the messages .	K2/K3/K4
CO2	Create the App and manipulate the table of information programming.	K2/K3/K6
CO3	Create the App for receiving and displaying the volume of inputs.	K2/K3/K5
CO4	Create the App for converting all type of currency.	K2/K3/K4
CO5	Create menu based App's.	K1/K2/K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Practical 1	**Display the Message**	**3 hours**
Creating an App to display the text “Hello World”.		
Practical 2	**Display the Table**	**3 hours**
Creating an App to create and display a table of information.		
Practical 3	**Receive and Display the Inputs**	**3 hours**
Creating an App to receive student details as input and display it.		
Practical 4	**Creating Converters**	**3 hours**
Creating a Simple Currency Converter App.		
Practical 5	**Login Process**	**4 hours**
Creating an App to demonstrate Login process (On success it should open a new page with success message).		
Practical 6	**Menu based**	**4 hours**
Creating a menu based app.		
	Total Practical hours	**20 hours**

Course Designed By

Dr. R.Pugazendi

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	**S**	**L**	**L**	**S**	**M**	**L**	**L**	**M**	**L**	**L**
CO2	**S**	**L**	**L**	**M**	**M**	**L**	**L**	**M**	**L**	**L**
CO3	**S**	**M**	**L**	**M**	**M**	**L**	**L**	**M**	**L**	**L**
CO4	**S**	**M**	**L**	**M**	**M**	**L**	**L**	**M**	**L**	**L**
CO5	**S**	**M**	**L**	**M**	**M**	**L**	**L**	**M**	**L**	**L**

S - Strong **M**- Medium **L**- Low