



**PSGR
Krishnammal College for Women**



DEPARTMENT OF INFORMATION TECHNOLOGY

**CHOICE BASED CREDIT SYSTEM (CBCS)
&
LEARNING OUTCOMES BASED CURRICULAR FRAMEWORK (LOCF)**

BACHELOR OF INFORMATION

TECHNOLOGY

2022-2025 BATCH



PROGRAMME LEARNING OUTCOMES (PLO's)

After Completion of the programme, the student will be able to

- PLO1:** Design, implement, and evaluate a computing-based solution to meet the industry standards.
- PLO2:** Apply computing theory and programming principles to real-time software design and development.
- PLO3:** Explore Current and emerging techniques and technologies to formulate solutions for systems and organizations.
- PLO4:** Pursue higher studies in the specialized area and also promote life-long learning for professional development.
- PLO5:** Recognize as world class professionals in IT and produce women entrepreneurs to increase employability.

PROGRAMME SPECIFIC OUTCOMES (PSO's)

The students at the time of graduation will

- PSO1:** Professionally be equipped in the areas of programming, Cloud Infrastructure, Internet of Things, Mobile Application Development and to be ease with the recent technologies of various domains.
- PSO2:** Apply the knowledge of technology and soft skills to carry out societal software development.
- PSO3:** Analyze modern computer languages and applications for their successful Career, to create platforms to become an entrepreneur and a relish for higher studies.



DEPARTMENT OF INFORMATION TECHNOLOGY

CHOICE BASED CREDIT SYSTEM & LEARNING OUTCOMES BASED
CURRICULAR FRAMEWORK (LOCF)

BACHELOR OF INFORMATION TECHNOLOGY – 2022-2025 BATCH

Semester	Part	Subject Code	Title of paper	Category	Instruction hours / week	Contact hours	Tutorial hours	Duration of Examination	Examination Marks			Credits
									CA	ESE	Total	
I	I	TAM2201/ HIN2201/ FRE2201	Language I	Language	6	86	4	3	50	50	100	3
	II	ENG2101	English Paper I	English	6	86	4	3	50	50	100	3
	III	PP22C01	Core-1: Programming in C	CC	4	56	4	3	50	50	100	4
	III	PP22C02	Core-2: Computational and Algorithmic Thinking for Problem Solving	CC	3	45	-	-	100 [#]	-	100	3
	III	IN22CP1	Lab 1: C Programminglab	CC	3	45	-	3	25	25	50	2
	III	TH22A03	Allied A1: Numerical and Statistical Techniques	GE	6	86	4	3	50	50	100	5
	IV	NME21ES	Introduction to Entrepreneurship	AEC	2	26	4	2	50	50	100	2
	NME22A1/ NME22B1/	Advance Tamil/ Basic Tamil/	AEC	2	28	2	2	50	50	100		
II	I	TAM2202/ HIN2202/ FRE2202	Language II	Language	6	86	4	3	50	50	100	3
	II	ENG2102	English Paper II	English	5	71	4	3	50	50	100	3
	III	IN22C03	Core-3: OOPs with JAVA	CC	5	71	4	3	50	50	100	5

	III	IN22CP2	Lab -2: OOPs Programming Lab	CC	5	75	-	3	25	25	50	3
II	III	TH22A06	Allied A2: Discrete Mathematics	GE	6	86	4	3	50	50	100	5
	IV		Open Course: (Self study - Online Course)	AEC	-	-	-	-	-	-	-	Gr ade
		NME22A2/ NME22B2	**Advance Tamil/Basic Tamil	AEC	-	-	-	-	-	-	-	Gr ade
	V	21PEPS1	Professional English for Physical Sciences	AEC	3	40	5	2	50	50	100	2
	VI	NM12GAW	General Awareness	AEC	Self Study	-	-	Online Test	100	-	-	Gr ade
	I	TAM2203A/ HIN2203A/ FRE2203A	Language III	Language	4	58	2	3	50	50	100	3
	II	ENG2203A	English Paper III	English	4	58	2	3	50	50	100	3
III	III	IN22C04	Core - 4: Operating System	CC	4	58	2	3	50	50	100	3
	III	IN22C05	Core - 5: Data Structure and Algorithm	CC	4	58	2	3	50	50	100	3
	III	IN22CP3	Lab 3: DBMS Lab	CC	5	75	-	3	25	25	50	4
	III	TH22A13	Allied A3: Optimization Techniques	GE	4	58	2	3	50	50	100	4
	III	IN22SBP1	SBS I : Full Stack Java Development Lab	SEC	3	41	4	-	100	-	100	3
	IV	NM22EVS	Foundation Course-II: Environmental Studies	AECC	Self-Study	-	-	-	100	-	100	Gr ade
	IV	NM22UHR	Foundation Course III: Universal Human Values & Human Rights	AECC	2	30	-	-	100	-	100	2

III & IV	VI	JOB21	Job Oriented Course- Mobile Application Development		-	-	-	-	-	-	-	Grade
IV	I	TAM2204A/ HIN2204A/ FRE2204A	Language IV	Language	4	58	2	3	50	50	100	3
	II	ENG2204A	English Paper IV	English	4	58	2	3	50	50	100	3
	II	IN22C06	Core 6: Computer Networks	CC	4	58	2	3	50	50	100	3
	III	IN22C07	Core - 7: Digital Logic and circuits	CC	4	58	2	3	50	50	100	3
	III	IN22CP4	Lab 4: Computer Networks Lab	CC	5	75	-	3	25	25*	50	3
	III	BP22A05 AP22A01 CS22A02	Allied A4: Paper I - Business Accounts Paper II –Digital Marketing Paper III – M-Commerce	GE	4	58	2	3	50	50	100	3
	III	IN22SBP2	SBS:II Linux Programming lab	SEC	3	41	4	-	100	-	100	3
	III	NM22DTG	Foundation Course IV: Design Thinking	Finishing School Part A	2	30	-	-	100	-	100	2
			COM15SER	Community Oriented Service		-	-	-	-	-	-	Grade
	V	V		NSS/NCC/YRC/Sports & Games.		-	-	-	-	-	100	1
V	III	IN22C08	Core 8: Python Programming	CC	5	73	2	3	50	50	100	5
V	III	IN22C09	Core 9 : Internet of Things	CC	5	73	2	3	50	50	100	4
V	III	AI22C10	Core 10: Machine Learning	CC	5	73	2	3	50	50	100	4
V	III	IN21E01 IN21E02 IN21E03	Elective: Cloud Computing Wireless Sensor Networks Augmented Reality/Virtual Reality	DSE	5	73	2	3	50	50	100	5

V	III	IN22CP5	Lab 5: Python Programming Lab	CC	5	75	-	3	25 [#]	25 [#]	50	3
V/ VI	III	IN20SBCE/ IN22SBP3	Coursera: Programming in PHP and MYSQL/ SBS III Data Visualization Tools Lab	SEC	3	45/41	-/4	-	100	-	100	3
V	III	IN16AC1 IN16AC2	Advanced Learner Course Data Mining/ Information Retrieval	ACC		-	-	3	25	75	100*	5*
	IV	NM21CS1	Cyber Security 1	AECC	2	30	-	-	100	-	100	Grade
	IV	IN22INST	Field work/ Institutional Training	DSE	-	-	-	-	100	-	100	2
	VI	IN22COM	Comprehensive Exam	GC	-	-	-	1	-	100	100	Grade
	VI	COM15SER	Community Services 30 Hours	GC	-	-	-	-	-	-	-	-
VI		IN21C13	Software Engineering and Testing	CC	5	73	2	3	50	50		
		IN22C12	Artificial Intelligence of Things	CC	5	73	2	3	50	50		
		IN22C11	Full Stack Web Development	CC	5	73	2	3	50	50		
		IN22CP6	IoT and FSW lab	CC	5	75	-	3	25 [#]	25 [#]		
		IN21PROJ	Project and Viva-Voce	DSE	7	105	-	1	50	50		
		IN20SBCE/ IN22SBP3	Programming in PHP and MYSQL/ Data Visualization Tools Lab	SEC	3	45/41	-/4	-	100	-		
		IN22AC3	ALC Robotic Process	ACC	SS	-	-	3	25	75		

		IN18AC4	Automation Big Data Analytics									
I- V	VI	16BONL1 16BONL2	Online Course I Online Course II	ACC	-	-	-	-	-	-	-	-
		Total									4000	140

* 100 Marks Converted into 50 Marks

*ESE conducted for 100 and converted to 25

** Outside Regular Class Hours

Only internal assessment

#CA conducted for 25 Marks

#ESE conducted for 100 and converted to 25

*The credit is applicable to a candidate who takes up the advanced learner I course exam.

CC: Core Courses

CA: Continuous Assessment

DSE: Discipline Specific Elective

ESE: End Semester Examination

AECC: Ability Enhancement Compulsory Course

SEC: Skill Enhancement Course

ACC: Additional Credit Course

GC: General Courses

COURSE	PROGRAMME OUTCOMES				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
PP22C01					
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
PP22C02					
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S
IN22CP1					
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S
IN22C03					
CLO1	S	M	S	S	M
CLO2	S	S	S	S	M
CLO3	S	M	M	S	S
CLO4	S	M	S	S	S
IN22CP2					
CLO1	S	S	M	S	M
CLO2	S	S	S	S	M
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S
IN22C04					
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S
IN22C05					
CLO1	S	M	M	S	S
CLO2	S	M	S	M	M
CLO3	M	M	S	M	S
CLO4	S	S	S	M	S

IN22CP3					
CLO1	M	M	S	S	M
CLO2	S	M	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
IN22SBP1					
CLO1	S	S	M	M	S
CLO2	S	M	S	M	S
CLO3	S	M	M	S	S
CLO4	M	S	S	S	S
IN22C06					
CLO1	M	M	S	S	S
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
IN22C07					
CLO1	S	S	M	M	S
CLO2	M	M	S	S	M
CLO3	S	S	S	M	S
CLO4	M	S	S	M	M
IN22CP4					
CLO1	M	M	S	S	S
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S
AP22A01					
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	S	S	M	S
CS22A02					
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	M
CLO4	S	S	S	M	S
IN22SBP2					
CLO1	M	M	S	S	M
CLO2	M	S	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

IN22C08					
CLO1	S	S	M	S	S
CLO2	S	M	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S
IN22C09					
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S
AI22C10					
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S
IN21E01					
CLO1	M	S	M	M	M
CLO2	S	M	S	S	S
CLO3	M	S	S	M	M
CLO4	S	S	M	S	S
IN21E02					
CLO1	S	M	S	S	S
CLO2	M	S	S	M	S
CLO3	S	M	M	S	M
CLO4	M	S	S	M	S
IN21E03					
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	S	M	S	M
IN22CP5					
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	M	M	M
CLO4	S	S	S	S	S
IN22SBP3					
CLO1	S	M	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

IN21C11					
CLO1	S	M	S	M	S
CLO2	S	M	S	M	M
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S
IN22C12					
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S
IN21C13					
CLO1.	S	M	S	M	S
CLO2.	S	S	S	M	S
CLO3.	M	S	M	M	M
CLO4.	M	S	S	S	S
IN22CP6					
CLO1	S	S	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	M	S
CLO4	S	S	S	S	S
IN22SbP3					
CLO1	S	M	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
PP22C01	PROGRAMMING IN C	Theory	56	4	-	4

Preamble

This course introduces fundamental programming constructs in C. It covers the concepts such as arrays, functions, structures, pointers and file handling. It provides comprehensive coverage on industry 4.0.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the programming constructs and structure of C programming and Industry 4.0 technologies	K1
CLO2	Understand the purpose of arrays, strings, structures, pointers and files to solve problems	K2
CLO3	Apply functions to solve problems using procedure oriented approach	K3
CLO4	Analyze the problems and solve it by applying appropriate logic	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

PROGRAMMING IN C - PP22C01

56 Hrs

Syllabus

Unit I

12 Hrs

Overview of C - Constants, Variables and Data types - Operators and Expressions - Managing Input and Output Operations - Decision Making and Branching - Decision Making and Looping.

Unit II

11 Hrs

Arrays: One-Dimensional - Two Dimensional - Multidimensional Arrays. Character Arrays and Strings: Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen
- String Handling Functions.

Unit III

11 Hrs

User-Defined Functions: Need - Return Values and Types - Function Calls - Function declaration - Category of Functions - No Arguments and No Return Values - Arguments but No Return Values - Arguments with Return Values - Recursion - Scope Visibility and Life time of Variables.

Structure Definition: Structure Initialization - Comparison of Structure Variables - Arrays of Structures - Arrays within Structures.

Unit IV

12 Hrs

Pointers: Understanding Pointers - Accessing the Address of a Variable - Declaring and Initializing Pointers - Accessing a Variable through its Pointers - Pointers and Arrays - Pointers and Character Strings - Pointers and Functions.

File Management in C: Defining and Opening a File - Closing File - I/O Operations on Files - Error Handling during I/O Operations - Command Line Arguments.

Unit V

10 Hrs

Introduction to Industry 4.0 - Need - Reasons for Adopting Industry 4.0 - Definition - Goals and Design Principles - Technologies of Industry 4.0 - Skills required for Industry 4.0 - Advancements in Industry

4.0 - Impact of Industry 4.0 on Society, Business, Government and People - Introduction to 5.0.

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	E. Balagurusamy	Programming In ANSIC	Tata Mc Graw Hill	8 th Edition, 2019
2	P. Kaliraj, T. Devi	Higher Education for Industry 4.0 and Transformation to Education 5.0	CRC Press - Taylor & Francis Group	1 st Edition, 2021

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Byron Gottfried	Programming with C	Tata McGraw Hill	4 th Edition, 2018
2	Yashwvant Kanetkar	Let Us C: Authentic Guide to C Programming Language	BPB Publications	17 th Edition, 2020

Pedagogy

- Lectures, Group discussions, Demonstrations

Course Designer

Mrs. Maria Shyla J

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDI T
PP22C02	COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING	Theory	45	-	-	3

Preamble

- This course aims to kindle the young minds to think like a computer scientist, with the idea that Computing and computers will enable the spread of computational thinking.
- Computational thinking is thinking recursively, reformulating a seemingly difficult problem into one which we know how to solve and taking an approach to solving problems, designing systems, and understanding human behavior that draws on concepts fundamental to computer science.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the basic principles of logical reasoning, problem solving in computational thinking	K1
CLO2	Understanding the applications of propositional logic, problem representation and techniques	K2
CLO3	Apply algorithmic thinking to problem solving using tools	K3
CLO4	Apply and analyze to solve domain specific problems using computational thinking concepts	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PL05
CLO1	M	S	S	S	S
CLO2	S	S	S	M	S
CLO3	S	M	S	S	S
CLO4	S	S	M	S	S

S - Strong; M - Medium; L - Low

COMPUTATIONAL AND ALGORITHMIC THINKING FOR PROBLEM SOLVING - PP22C02 45 Hrs

Syllabus

Unit I

7 Hrs

Basics: Introduction to Computational Thinking- Data Logic - History of Computational Thinking-Applications of Computational Thinking.

Unit II **8 Hrs**

Data- Information and Data - Data Encoding - Logic - Boolean logic - Applications of simple Propositional Logic. Tool: Flowgorithm and Scratch.

Unit III **10 Hrs**

Problem Solving and Algorithmic Thinking: Problem definition- Logical reasoning- Problem decomposition- Abstraction- Problem representation via Algorithmic thinking: Name binding- Selection- Repetition and Control Abstraction- Simple Algorithms – Comparison of performance of Algorithms.

Unit IV **8 Hrs**

Activities in Class: Sudoku-Towers of Hanoi- Graph Coloring-Geographical Map reading- Poem reading-Novel reading- Data analysis on news.

Unit V **12 Hrs**

Problem Solving Techniques- Factoring and Recursion Techniques- Greedy Techniques-Divide and Conquer- Search and Sort Algorithms- Text Processing and Pattern matching. Tool: iPython

Text Book

S. No	Author	Title of the Book	Publisher	Year of Publication
1	David Riley and Kenny Hunt	Computational Thinking for Modern Solver	Chapman & Hall/CRC	2014
2	Paolo Ferragina, Fabrizio Luccio	Computational Thinking First Algorithms	Springer	2018
3	Karl Beecher	Computational Thinking – A beginner’s guide to problem solving	BSC publication	2017

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

Mrs. V. Deepa

Evaluation Pattern:

Assessment	Number	Marks
Quiz (online or offline)	5	50
Class Activity	5	25
Group Project (Domain Specific)	1	25
Total		100

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP1	C PROGRAMMING LAB	PRACTICAL	-	-	45	2

Preamble

- The course gives hands-on experience on C Programming and improves the practical skillset.
- The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code.
- The course involved in compiling, linking and debugging C code and developing some complex programs.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Identify the basic terminologies of C programming such as data types, conditional statement, looping statements and functions.	K1
CLO2	Develop programs with implementation of arrays, string handling functions and parameter passing techniques.	K2
CLO3	Construct programs with features of Structure and Pointers.	K3
CLO4	Develop readable programs with files for reading input and storing the output with perform operations	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	S	S	M
CLO4	S	S	M	S	S

S- Strong; M-Medium; L-Low

C PROGRAMMING LAB- IN22CP1

45 Hrs

Program List

- Basic Operations Statement.
- Control Structures.
- Arrays.
- Structure.
- Arrays within structure
- String handling functions.

- User defined functions.
- Pointers.
- File operations.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Dr.K.Sathiyakumari

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C03	OOPs WITH JAVA	THEORY	71	4	-	5

Preamble

This course gives in-depth knowledge of JAVA and OOPs concepts. It has been designed to enable novice programmers to enhance their programming skills. It also sheds light around widespread applications of the internet.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamentals of OOP's and Java Concepts	K1
CLO2	Understand the concepts of Inheritance, Exceptions & I/O Classes	K2
CLO3	Develop the applications by applying Streams and Collections	K3
CLO4	Analyze & implement the real-time applications by GUI Programming	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PL03	PL04	PL05
CLO1	S	M	S	S	M
CLO2	S	S	S	S	M
CLO3	S	M	M	S	S
CLO4	S	M	S	S	S

S- Strong; M-Medium; L-Low

OOPs WITH JAVA - IN22C03

71 Hrs

Syllabus

Unit I

14 Hrs

Introduction to Object Oriented Programming Paradigm and Java Language: Introduction – Evaluation of Higher Level Languages – Object Oriented Programming Paradigm – Evolution of Java – Java, Salient Features of Java Language -Internet and world wide web – Java Environment – Java Language Preliminaries: Keywords and Identifiers, Constants –Variables – Data Types- Console I/O, Structure of a Java program – Executing a Java Program.

Unit II

14 Hrs

Classes, Objects and Methods: Introduction- Class Definition Instance Variables and Member Methods- Declaration of Objects and Accessing Members – Classification of Members methods- Constructors- Passing Objects to Methods as Arguments – Static Member Data – Static member

methods –Recursion-Variable Arguments- Garbage Collection and Finalize method.

Unit III

15 Hrs

Inheritance: Introduction – Types of Inheritance: Single level Inheritance – Multi level Inheritance – Hierarchical Inheritance-Hybrid Inheritance- Constructors and Inheritance – Abstract classes and methods- Interface. Exception Handling: Threads in Java- Types of Exceptions: - Built-in-Exceptions- Custom Exception–Try Block – Nested Try Blocks –Throw Statement – Finally Statement.

Unit IV

14 Hrs

The I/O Package: Byte Streams – Character Streams – InputStreamReader and OutputStreamWriter - The Stream Classes: Synchronization – Filter streams – Buffered Streams – ByteArray Byte Streams - CharArray Character Streams – String Character Streams – StreamTokenizer. The data Byte Streams – Working with Files – Object Serialization – The IOException Classes.

Unit V

14 Hrs

Collections & GUI Programming: Collections: Exception Conventions – Iterations – The Collection Interface – Set and SortedSet – List – Map and SortedMap – Wrapped Collections and the Collections Class. Graphical Programming: Introduction – Graphics Programming – Handling Events – Swing Components.

Text Book

S.No	Author	Title of the Book	Publishers	Year of Publication
1.	M.T. Somashekara, D.S,Guru&K.S.M anjunatha.	Object Oriented Programming with Java	PHILearning Pvt Ltd,Delhi	2017

Reference Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	Rajkumar Buyya, S Thamarai Selvi, Xingchen Chu	Object Oriented Programmingwith Java	Tata McGraw Hill	2009
2	Ken Arnold,James Gosling, David Holmes	The Java Programming Language	Addison-Wesley	2005

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr. S. Nithya

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP2	OOPs PROGRAMMING LAB	PRATICAL	-	-	75	3

Preamble

The course is designed to develop application using Java Principles. It helps to apply the concepts of Java and OOPs in different applications. The course also covers basic concepts of Bioinformatics.

Course Learning Outcomes

On the Successful Completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the features of OOP's & Java	K1
CLO2	Understand the various types of Methods	K2
CLO3	Apply the concepts of Collections, Events and Swings	K3
CLO4	Implement the real-time applications by using GUI programming.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	M
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

OOPs PROGRAMMING LAB - IN22CP2

75 Hrs

Program List

- Class & Objects
- Constructor
- Recursion
- Inheritance
- Interface
- Exception Handling
- Thread Priority
- I/O Streams

- Collections
- Events
- Swing

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Dr.S.Nithya

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C04	OPERATING SYSTEM	THEORY	58	2	-	3

Preamble

To provide a discussion of the fundamentals of operating system design and to relate these to contemporary design issues and to current directions in the development of operating systems.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall about the basic concepts of operating system.	K1
CLO2	Understand the concept of storage, processor, multiprogramming and various disk optimization approaches.	K2
CLO3	Applying various algorithms for scheduling, partitioning and storage management concepts.	K3
CLO4	Analyze UNIX system and MS DOS for various file and memory management system.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S

S- Strong; M-Medium; L-Low

OPERATING SYSTEM – IN22C04

58 Hrs

Syllabus

UNIT I

12 hrs

Introduction and process concepts: Definition of OS - **Definition of process - Process States - Process State Transition** - Interrupt Processing - Interrupt classes- Semaphores - **Deadlock and Indefinite postponement.**

UNIT II

12 hrs

Storage management: Real storage: Real storage management strategies - **Contiguous Vs non-contiguous storage allocation - Single user contiguous storage allocation** - Fixed partition multiprogramming - Variable partition multiprogramming - **-Virtual storage: Virtual storage management strategies:** Page replacement strategies - working sets - Demand paging-Page Size.

UNIT III**12 hrs**

Processor management: Job and processor scheduling: Preemptive Vs Non-preemptive scheduling – **priorities - Deadline scheduling - FIFO-RR - SJF-SRT-HRN** - distributed computing– Pipelining – **Vector processing** - Dataflow computers – Multiprocessing - **Fault Tolerance.**

UNIT IV**12 hrs**

Device and information management: Disk performance optimization: Operation of moving head disk storage - **Need for disk scheduling – FCFS - SSTF – SCAN** - RAM Disks - Optical Disks - **file and database systems: File system – functions – Organization - Access control by user Classes**Allocating and freeing space - file descriptor -Backup and Recovery.

UNIT V**10 hrs****Case Studies**

UNIX Systems: Kernel-Shell - **File System-Process Management-Memory Management**-Distributed UNIX Systems-UNIX Systems Standardization and open systems. **MS-DOS:MS DOS various Versions.**

Text Book

S.No.	Authors	Title	Publishers	Year Of Publication
1.	Deitel H.M	An Introduction to Operating System	Addison Wesley Publishing Company, Second edition	2005

Reference Books

S.No.	Authors	Title	Publishers	Year Of Publication
1.	Andrew S.Tanenbaum, Albert S.Woodhull,	Operating Systems- Design and Implementation	Pearson Education, 3 rd Edition	2011
2.	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne	Operating System Concepts	John Wiley & Sons,8 th edition	2010
3.	Archer J Harries	Operating Systems	Tata McGraw Hill, First Edition	2008

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Mrs. G.Rubadevi

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C05	DATA STRUCTURE AND ALGORITHM	THEORY	58	2	-	3

Preamble

To provide an overview of data structures and algorithm design methods for programming and problem-solving process.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall about the concepts of Arrays, Stack, Queue, Link List, Trees and Graph.	K1
CLO2	Understand sorting, searching and hashing algorithm	K2
CLO3	Apply the data structures to solve various computing algorithms and sorting algorithms.	K3
CLO4	Analyze lists, queues, stacks, trees and graph according to the needs of different applications	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	S	S
CLO2	S	M	S	M	M
CLO3	M	M	S	M	S
CLO4	S	S	S	M	S

S- Strong; M-Medium; L-Low

DATA STRUCTURE AND ALGORITHM- IN22C05

58 Hrs

Syllabus

UNIT-I

12 Hrs

Introduction to Data Structure: Definition, Basic Terminology, Elementary Data Organization - Types of Data Structures- Linear & Non-Linear Data Structures-Data Structure Operations. Algorithm Specifications: Performance Analysis and Measurement (Time and space analysis). **Abstract Data Types- Advantages of ADT.** Array: Representation of arrays, Types of arrays, Applications of arrays, Sparsematrix and its representation.

UNIT-II

12 Hrs

Stacks and Queues: Stack-Stack Representation & Implementation-Stack Operations-**Applications of Stack.** Queue-Queue Representation & Implementation-Queue Operations-**Types of Queues.**

UNIT-III**11 Hrs**

Linked List: Linked List as Data Structures- Representation of Linked List-Operations on Linked List-Stacks Linked List-Queue as Linked List-**Doubly Linked List-Circular List.**

UNIT-IV**13 Hrs**

Trees: Preliminaries-Binary Trees-**B-Trees**. Graph: Graph Terminologies-**Types of Graphs**-Graph Representation. **Hashing: Hash Functions**. Sorting: Bubble Sort-Selection Sort-Quick Sort-Heap Sort-Merge Sort.

UNIT-V**10 Hrs**

Algorithm Design Techniques: Greedy Algorithms - Prim's Algorithm, Kruskal's Algorithm. **Divide and Conquer: Running Time of Divide and conquer algorithms**. Decrease and Conquer- Depth First Search and Breadth First Search. Backtracking Algorithms - n Queens Problem, **Branch and Bound – Traveling Salesman Problem.**

Text Books

S.No.	Authors	Title	Publishers	Year of Publication
1.	Rajesh K. Shukla	Data Structures using C & C++	Wiley India	2009
2.	Seymour Lipschutz, G A Vijayalakshmi Pai	Data Structures	Tata McGraw-Hill	2014

Reference Books

S.No.	Authors	Title	Publishers	Year of Publication
1.	Anany Levitin	Introduction to Design and Analysis of Algorithms	Pearson Education	2009
2.	Wisnu Anggoro	C++ Data Structures and Algorithms	Packt Publishing	2018
3.	YedidyahLangsam, Moshe J.Augentein, aron M.Tenenbaum	Data Structures using C & C++	PHI Learning, 2 nd Edition	2009

Pedagogy

- Chalk & talk, PPT, Group Discussion, Assignment, Demo, Quiz, Role play.

Course Designer

Dr. R. Jeevitha

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP3	DBMS LAB	PRACTICAL	-	-	75	4

Preamble

The lab course provides a way to explore storing and accessing data in database through query languages and PL/SQL programming language. It enables to experience a NoSQL key/value

store database MongoDB.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand basic SQL query statements	K2
CLO2	Gain knowledge on primary and foreign key constraints	K2
CLO3	Apply functions and joins on data	K3
CLO4	Demonstrate PL/SQL programming on databases and differentiate Key/value store database from relational database	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	M
CO2	S	M	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

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

DBMS LAB - IN22CP3

75 Hrs

Program List

- Different data types and operators.
- ER diagram with entities , attribute ,keys and relations.
- Integrity constraints
- Built-in functions and views.
- Create, insert, update and alter table.
- Implement PL/SQL Block.

- Control Structures and Embedded SQL
- Splitting and Joining the table
- PL/SQL Functions
- PL/SQL Procedure
- A case study and formulate the problem statement on a specify project.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designers

Mrs. V .Deepa

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22SBP1	SBS I: FULL STACK JAVA DEVELOPMENT LAB	PRACTICAL	-	-	45	3

Preamble

To develop will help you master both front-end and backend Java technologies and accelerate your career as a full stack software developer.

Course Learning Outcomes

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

CLOs	CLO Statement	Knowledge Level
CLO1	Tell about basics of Core Java, Data Structures, Frontend Design and Backend development	K1
CLO2	Understand the Data Structure and testing concepts for working in databases, implementing responsive design to scale well across gadgets (PC, Tablets, Mobiles)	K2
CLO3	Applying the servlet services for extend the capabilities of services that host Application	K3
CLO4	Analyze the challenges and inculcating the concepts in real time web-based Applications	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	M	S
CLO2	S	M	S	M	S
CLO3	S	M	M	S	S
CLO4	M	S	S	S	S

S- Strong; M-Medium; L-Low

FULL STACK JAVA DEVELOPMENT LAB - IN22SBP1 45 Hrs

Program List

- Create a java program to get numbers from the user and display the numbers in ascending and descending order using array.
- Create a java program for file handling.

- Create a java program to implement interface.
- Create a login page with database connectivity using java.
- Write a selenium test case for opening our college website's home page.
- Develop a CMS to implement a blog for article writing using java.
- Develop a java program to monitor bitcoin price using coin desk API.
- Develop a java program for implementing ATM Interface.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Mrs. G.Rubadevi

JOB ORIENTED COURSE

Title : Mobile Application

DevelopmentSubject Code : JOB21

OBJECTIVE:

Students can find jobs as mobile computing professionals and application developer.

UNIT I

Overview - Environment Setup - Architecture - Applications Component - Developer Tools - SDK Manager – Emulator- Hello World Example

UNIT II

Activities - Services - Broadcast Receivers - Content Providers - Fragments - Intents & Filters - UI Layouts -UI Design - UIControls - Event Handling - Styles & Themes – Notifications - Push Notification

UNIT III

Location-Based Services - Sending Email - Sending SMS – Web View - Phone Calls - Publishing Android Application - Alert Dialog Tutorial - Animations - Audio Capture - Auto complete

UNIT IV

Best Practices - Bluetooth - Camera - Custom Fonts - Gestures Image Effects - Image Switcher - Media Player – Multi touch - Navigation - Progress Circle - Progress Bar Using Progress Dialog

UNIT V

SQLite Database - Login Screen - Internal Storage - JSON Parser - Loading Spinner - Localization - Network Connection - NFC Guide - PHP/MySQL - Sensors - Session Management - Sip Protocol -Support Library – Wi-Fi - Widgets - Xml Parser

TEXT BOOKS:

- 1) Android studio application development by belencruzzapata
- 2) Beginning android programming with android studio by Jerome F. Dimarizio

REFERENCES:

- 1) http://www.tutorialspoint.com/android/android_tutorial.pdf
- 2) http://www.e-reading.club/bookreader.php/142063/Android_-_a_programmers_guide.pdf

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C06	Computer Networks	Theory	58	2	-	3

Preamble

The subject is intended to provide the student with the in-depth knowledge of Networks. It also sheds light around wide spread applications of the Internet.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Tell about the Fundamental concepts of Data communication, Transmission Media and Networking.	K1
CLO2	Understand data communication using the network topologies, layered model and internetworking.	K2
CLO3	Apply the networking concepts and communication protocol in real-time Applications, Virtual LAN Management	K3
CLO4	Analyze the principles of data communication, devices, transmission Mechanism and network protocols.	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	S
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

Computer Networks - IN22C06

(58 hours)

Unit 1:

(12 hours)

Introduction to Networks: Classifications of computer networks- - Modes of Data Transmission: **Simple, Half duplex, Full duplex communication -Topologies of Computer Networks** - The OSI Reference Model: Introduction to the OSI Reference Model - Seven Layers - Functions of OSI Reference Model-Protocols and Standards- Internetworking devices .

Unit 2

(12 hours)

Transmission Media: Guided Media- Unguided Media, - **Techniques for Bandwidth utilization: Multiplexing - Frequency division, Time division and Wave division, Concepts on spread spectrum.** Data Link Layer: Error Deduction and Correction-Sliding window protocol-Stop and wait protocol. LAN: Wired LAN, Wireless LAN, Virtual LAN : Managing VLAN and its benefits.

Unit 3

(11 hours)

Network Layer Services : **Switching: Circuit Switched Network-Packet -Switching**-Structure of a switch- **IP Addressing: The Purpose of IP addresses - The Hierarchy of IP Addresses**-Routing Algorithms – Static routing protocols-Routing Information Protocol- Open Shortest Path First Protocol .

Unit 4

(11 hours)

Transport Layer: Connection establishment, Connection release, The Internet Transport Protocols: UDP, TCP. Application Layer: Providing services, Applications layer paradigms: DNS-Client server model, HTTP, **E-mail, WWW, TELNET.**

Wireless and Mobile Networks: Wireless links, Characteristics-CDMA- Bluetooth - Architecture-Bluetooth layers. **Satellite Networks -Operation, GEO, MEO and LEO satellites.** Cellular Internet Access- Architecture, **Standards-3G,4G,5G**, Near Field Communication (NFC). Mobility - Principles, Addressing and routing to mobile users, Mobile IP, Handling mobility in Cellular Networks.

Text Book

S. No	Authors	Title	Publishers	Year of Publication
1.	Behrouz A. Forouzan	Data Communications and Networking	Tata McGraw-Hill PubCompany Ltd, 5 th Edition,	2017
2	Silviu Angelescu	CCNA Certification All-in - One For Dummies	For Dummies	2010
3	Andrew S. Tanenbaum	Computer Networks	Prentice Hall of India, 4 th Edition	2012

Reference Books

S. No	Authors	Title	Publishers	Year of Publication
1.	Larry L Peterson, Bruce S Davie	Computer Networks - A systems approach	Elsevier Press	5th Edition, 2012
2	Prakash C. Gupta	Data Communication & Computer Networks	PHI Learning Pvt Ltd 2nd Edition	2014

Pedagogy

- Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz, Case study, ICT tools.

Course Designer

Mrs. V. DEEPA

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C07	DIGITAL LOGIC AND CIRCUITS	THEORY	58	2	-	3

Preamble

To impart the knowledge on simulation of digital system and functionality of Combinational circuits Boolean Algebra and flip flops.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the principles of binary number system and basic logic gates.	K1
CLO2	Understand the operations on Boolean laws and Theorems and Karnaugh Map	K2
CLO3	Applying the basic principles and types of registers, counters and the functionality of Multiplexers and Flip Flops	K3
CLO4	Analyze the concept of Memory Addressing and programmable logic devices	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	M	S
CLO2	M	M	S	S	M
CLO3	S	S	S	M	S
CLO4	M	S	S	M	M

S- Strong; M-Medium; L-Low

DIGITAL LOGIC AND CIRCUITS - IN21C07

(58Hrs)

Syllabus

UNIT I:

(12 hrs)

Number Systems and Codes: Binary Number system – Binary to Decimal –Decimal to Binary – Hexa Decimal — Excess-3 Code – Gray code- **Error Detection and Correction. DIGITAL LOGIC: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.**

UNIT II:

(12 hrs)

Combinational Circuits: Boolean Laws and Theorems - Sum of Products method – Truth table to Karnaugh Map –Don't Care Conditions- Product-of sums method -Product-of sums Simplifications.

UNIT III:

(11 hrs)

Data Processing Circuits: Multiplexers – Demultiplexers- Encoders –Decoders. Flip-Flops-RS Flip-Flops - Edge-triggered D Flip-flops--Edge-triggered JK Flip-Flops-JK Master Slave Flip-flops.

UNIT IV:

(12 hrs)

Types of Registers: Serial In-Serial Out – Serial In-Parallel Out – Parallel in Serial Out - Parallel In- Parallel Out – Universal Shift Register. COUNTERS: Ring Counter –Ripple Counter –

Asynchronous Counter - Synchronous Counter.

UNIT V:

(11 hrs)

Memory: Magnetic Memory – optical memory – Memory Addressing – ROM – RAM – EPROM – PROM – **Sequential programmable logic devices – Content Addressable memory.**

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1	Donald P Leach, Albert Paul Malvino, Goutam Saha	Digital Principles and Applications	McGraw-Hill Education, 8th edition	2015

Reference Books

S.No.	Authors	Title	Publishers	Year of Publication
1	R. Anantha Natarajan	Digital Design	PHI Learning	2015
2	K. Meena	Principles of Digital Electronics	PHI Learning	2013

Pedagogy

Chalk & talk PPT, Group Discussion, Assignment, Demo, Quiz, Role play.

Course Designer

Dr .K. Sathyakumari

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP4	Computer Networks Lab	Theory	-	-	75	3

Preamble

The subject is intended to provide the student with the in-depth knowledge of Networks This imparts a detailed knowledge on designing the structure and topology of different types of networks and various routing protocols.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Design the Fundamental concepts of Data communication, Transmission Media and Networking using network devices.	K1
CLO2	Understand by designing various types of network topologies and internetworking.	K2
CLO3	Apply the networking concepts and communication protocol in real-time Applications, Virtual LAN Management	K3
CLO4	Implement and configure different types of routing protocols , TCP,UDP.	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	S
CLO2	M	M	S	S	S
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

Computer Network lab Syllabus -75 hrs

- Basic Switch and End Device Configuration
- Configure SSH, Router Interfaces
- Implement a small network
- Topology of network
- Connecting Router to LAN
- Implementing Vlan
- Static routing protocol
- Routing information protocol
- Open shortest path first protocol
- Investigate the TCP/IP and OSI Models in Action
- Telnet
- Point to point with password authentication protocol
- Exploration of TCP and UDP

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Mrs. V. Deepa

Course Number	Course Name	Category	L	T	P	Credit
AP22A01	Digital Marketing	Theory	58	2	-	3

Preamble

- This course provides an overall understanding of the various digital marketing platforms and tools available for creating an effective digital marketing strategy. It provides technical skills to design and develop an integrated digital marketing plan for an organization.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the role of digital marketing in marketing strategy	K1
CLO2	Understand the key elements of a digital marketing strategy	K2
CLO3	Apply the role that social marketing plays in the digital marketing	K3
CLO4	Analyze common digital marketing tools such as SEO and Social media and apply conceptual frame works of digital marketing	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	M	M
CLO4	S	S	S	M	S

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

Syllabus

Unit – I

(12 Hrs)

Introduction to Digital Marketing: **Introduction - Original and Development of Digital Marketing** - Internet Users: Penetration and Kind of Internet Use - Digital Marketing strategy – Digital Advertising Marketing Plan - Ethical and legal of framework of Digital Marketing - **Skills Required in Digital Marketing** - Digital Advertising: Introduction - Concept of display advertising - Digital Metrics

Types of Digital Ad - Targeting in digital marketing - Challenges faced by display marketing.

Unit – II

(11 Hrs)

Search Engine Advertising: Introduction – **Why pay for search advertising?** – Understanding Ad Placement – Understanding Ad Ranks – **Why is the Ad rank important?** – Create your first Ad Campaign – Google Ads Account – Best practices for creating effective Ads - Enhance your Ad Campaign – Performance Reports – E-Commerce

Unit – III

(12 Hrs)

Face book Marketing : Introduction – **Organic Marketing** – Paid Marketing – Facebook Insights LinkedIn: Introduction - LinkedIn Strategy - Content Strategy - LinkedIn Native Videos - LinkedIn Analytics - Asset

Copying - LinkedIn Sales Navigator - **Emerging Platforms: Instagram**

Unit – IV

(12 Hrs)

Search Engine Optimization: Introduction – **Search Engine – The Concept of SEO** – SEO Phases – Website Audit – Content – Social Media Reach – Maintenance – Local Search SEO – SEO Visual Search – Voice Change will change the SEO Industry – Sub domains vs Subfolders – Website Navigation - External Links – Pop-ups – **Advanced Website Features.**

Unit – V

(11 Hrs)

Mobile Marketing: Introduction – **Mobile Advertising** – Mobile Marketing Toolkit – Mobile Marketing Features – Mobile Analytics. Digital Analytics: Introduction – **Data Collection** – Key Metrics – Experience Analysis – Making Web Analytics Actionable – **Types of Tracking Code** – Competitive Intelligence.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Seema Gupta	Digital Marketing	McGraw Hill Education 2nd Edition	2018

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Simon Kingsnorth	Digital Marketing Strategy: An Integrated Approach to Online Marketing 2nd Edition	Kogan Page	2 nd Edition, 2019
2	Dave Chaffey	Digital Marketing	Pearson	7 th Edition, 2019
3	Stephanie Diamond	Digital Marketing All-in-One for Dummies	For Dummies	1 st Edition, 2019
4	Kevin Hartman	Digital Marketing Analytics: In Theory and In Practice	Ostmen Bennett Bridge Publishing Services	2 nd Edition, 2020

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer

Dr. G. Sangeetha

Course Number	Course Name	Category	L	T	P	Credit
CS22A02	M-Commerce	Theory	58	2	-	3

Preamble

This course provides an insight on M-Commerce principles and business models. It also explores the concept of mobile commerce technologies, applications, mobile payment methods, security, and ethics.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamental concept of E-commerce and process of business models	K1
CLO2	Understand the architecture and applications of M-Commerce	K2
CLO3	Illustrate the risks, issues, legal and security aspects in M-Commerce	K3
CLO4	Analyze the infrastructure, fraud prevention and payment methodologies and examine the legal and ethical issues in mobile commerce	K4

Mapping with Programme Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	S	S	M	S	M
CLO3	S	S	S	S	M
CLO4	S	S	S	M	S

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

M-Commerce - CS22A02

(58 Hrs)

Syllabus

Unit I

12 Hrs

Introduction to E-commerce: Introduction - **E-commerce** - E-business - Categories of E-commerce applications - Traditional and Electronic commerce - Advantages and disadvantages of E-commerce. Business Models of E-commerce: Introduction - **Business models of E-commerce**- Business to Consumer (B2C) - Business to Business (B2B) - Difference between B2C and B2B - C2C: Definition - **Characteristics and Applications of C2C EC**

Unit II

11 Hrs

Mobile commerce and WAP: Introduction to Mobile commerce - Application - Advantages of M-commerce - **Wireless Application Protocol** - WAP Browser - Features of WAP 2.0 - **Technologies of M-commerce**

Unit III

12 Hrs

Mobile commerce Risk, Security and Payment Methods: Introduction - Security and Payment Methods - **Mobile Commerce Security** - Security Mechanism - Mobile Security - Network Infrastructure and Security- **WLAN and Security** - WAP and Security - Mobile commerce payment methods - **Mobile payment operations**

Unit IV**12 Hrs**

Mobile Money Infrastructure and Fraud Prevention for M- Payment: Introduction - **Requirement for authentication infrastructure for M-commerce** - Trust relationship - Requirement for Mobile commerce - Password based authentication for mobile users with support for public key technology - **M - payment value chain** - Life cycle - Operational Issues in M-Commerce payment - **Mobile payment systems** - General analysis of the payment solutions

Unit V**11 Hrs**

Legal and Ethical Issues : Introduction - **Issues related to E- commerce** - Legal issues - Taxation and E-commerce - Cyber Laws : Introduction - **Cyber laws in India** - Salient Provisions of Cyber Law - Contracting and contract Enforcement - **IT act 2000**

Text Book

S. No	Author	itle of the Book	Publisher	Year of Publication
1	Dr. U.S. Pandey & Er. Saurabh Shukla	E- Commerce and Mobile Commerce Technologies	S. Chand & Company Pvt. Ltd	2 nd Revised Edition, 2014

Reference Books

S. No	Author	Title of the Book	Publisher	Year of Publication
1	Karabi Bandyopadhyay	Mobile Commerce	Prentice Hall India Learning Private Limited	2013
2	Paul May	Mobile Commerce: Opportunities, Applications, and Technologies of Wireless Business	Cambridge University Press;	1 st Edition, 2001
3	Norman Sadeh	M-Commerce: Technologies, Services, and Business Models	John Wiley & Sons,	2003

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies

Course Designer**Dr. S. Nithya**

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22SBP2	SBS:2 LINUX PROGRAMMING LAB	III	-	-	45	3

Preamble

The course is designed to exercise basic linux commands, file and disk handling utilities by using Linux shell environment. To implement shell programming, pipes, control structures, functions, debugging shell scripts.

Course Learning Outcomes

On the Successful Completion of the course, students will be able to

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand basic linux commands, shell scripting	K2
CLO2	Demonstrate the shell scripting using control structures	K2
CLO3	Apply the shell programming to solve real-time problems	K3
CLO4	Analyze file handling utilities and functions in linux shell environment	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	M	S	S	M
CLO2	M	S	S	S	M
CLO3	S	S	S	S	S
CLO4	S	S	S	S	S

S- Strong;
Medium;

M-
L-Low

LINUX PROGRAMMING LAB - IN22SBP2 45 Hrs

Program List

1. Install Linux and exercise Linux basic Commands
2. Exercise Shell variables and environments
3. Exercise Control Structures
4. Exercise a Shell Script that accepts a file name, starting and ending line numbers as arguments and displays all lines between the given line numbers.
5. Exercise a shell script that deletes all lines containing the specified word in one or more files supplied as arguments to it.
6. Exercise a shell script that displays a list of all files in the current directory to which the user has read, write and execute permissions.
7. Exercise a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
8. Exercise a shell script to list all of the directory files in a directory
9. Exercise a shell script to find factorial of a given number.
10. Exercise a shell script to display fibonacci series

11. Exercise a shell script to perform arithmetic operation
12. Exercise a shell script to check palindrome
13. Exercise a shell script to find area and perimeter
14. Exercise a shell script to perform bubble sort
15. Exercise a shell script using function

Pedagogy

Demonstration of working environment/Tools/Software/Program

Course Designer Mrs

G. Rubadevi

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C08	PYTHON PROGRAMING	THEORY	73	2	-	5

Preamble

This course is designed to introduce the python programming language. The focus of the course is to provide students with an introduction to programming the Functions, Module and Packages, sets, Lists, Exception, Tuples, Files, Directories and explores the object-oriented programming aspects of python with help of built in modules.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the fundamental Python syntax and semantics.	K1
CLO2	Applying the concept of functions, operations in file system and exception handling	K2
CLO3	Analyzing the structures of list, tuples and maintaining dictionaries	K3
CLO4	Developing the skill of designing Graphical user Interfaces in Python	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	S
CLO2	S	M	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium.

PYTHON PROGRAMING-IN22C08

(73 hours)

Syllabus

UNIT I

(14 Hrs)

Introduction to Programming in Python: The Python Programming Language-**History, features, Structure of a Python Program**, Installing Python, Running Python program, Debugging- Syntax Errors, Runtime Errors, Semantic Errors, Experimental Debugging. **Variables and Expressions, Operators and Operands. Conditional Statements - if, if-else, nested if –else. Looping-for, while, nested loops. Control statements-Terminating loops**, skipping specific conditions.

UNIT II

(14 Hrs)

Functions and Strings: Functions-**Function Calls, Type Conversion Functions, Math Functions, Adding new functions, Parameters and Arguments, Fruitful functions and void functions**, Recursion. Strings-A String Is a Sequence, Traversal with a for Loop, String Slices, Strings Are Immutable, Searching, Looping and Counting, String Methods, The in Operator, String Comparison, String Operations.

UNIT III

(15 Hrs)

Lists, Tuples and Dictionaries: Lists- Values and Accessing Elements, Lists are mutable, traversing a List, List operations, List Slices, List Methods, **Deleting elements from List, Built-in List Operators, Concatenation, Repetition, In Operator, Built-in List functions and methods.** Tuples and Dictionaries-Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, **Basic tuples operations, Concatenation, Repetition, in Operator, Iteration, Built-in Tuple Functions.** Creating, Accessing Values, Updating and Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary, Built-In Dictionary Functions and Methods.

UNIT IV

(15 Hrs)

Files and Exception handling: Files -Text Files, File Objects, **File Built-in Methods, File Built-in Attributes, Standard Files, Reading and writing, Format operator, Filenames and Paths,** Pipes. Exceptions: Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.

UNIT V

(15 Hrs)

Modules and Packages: Modules - Modules and Files, Namespaces, Importing Modules, Importing Module Attributes, **Module Built-in Functions.** Python packages- **Simple programs using the built-in functions of packages matplotlib, numpy, pandas. GUI Programming - Tkinter** introduction, Buttons and callbacks, Canvas widgets, Coordinate sequences, Tk Widgets, Menus and Callables.

Text Book

S.No	Authors	Title	Publishers	Year and Edition
1	Allen B. Downey	Think Python: How to Think like a Computer Scientist	O'Reilly Publishers,	2016 , 2nd Edition,
2	Ashok Namdev Kamthane, Amit Ashok Kamthane	Programming and Problem Solving with PYTHON	McGraw-Hill	2018,2 nd Edition

Reference Book

S.No	Authors	Title	Publishers	Year and Edition
1	E. Balagurusamy	Problem Solving and Python Programming	McGraw-Hill	2017, 1 st Edition
2	Guido van Rossum and Fred L. Drake Jr	An Introduction to Python – Revised and updated for Python 3.2	Python Software Foundation, Network Theory Ltd	2011,1 st Edition
3	Wesley J Chun	Core Python Applications Programming	Prentice Hall	2012, 3 rd Edition

Pedagogy

- Chalk and Talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr. R. Jeevitha

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C09	INTERNET OF THINGS	THEORY	73	2	-	4

Preamble

The course covers the fundamentals of IoT, Understand IoT Market perspective, IoT Architecture and Data and Knowledge Management and use of Devices in IoT Technology. To build a small low cost embedded system using Arduino / Raspberry Pi or equivalent boards. Apply the concept of Internet of Things in the real world scenario.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the vision of IoT from a global context.	K1
CLO2	Design a portable IoT using Arduino/ equivalent boards and relevant protocols.	K2
CLO3	Develop web services to access/control IoT devices.	K3
CLO4	Deploy an IoT application and connect to the cloud	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S

S- Strong; M-Medium.

INTERNET OF THINGS- IN22C09

73 Hrs

Syllabus

UNIT I

(14Hrs)

Introduction & Concepts: Definition & Characteristics of IoT - Physical Design of IoT: Things in IoT - IoT Protocols - Logical Design of IoT: IoT Functional Blocks, Communication Models, Communication APIs - IoT Enabling Technologies: **Wireless Sensor Networks – Cloud Computing – Big Data Analytics – Communication Protocols** – Embedded Systems - IoT Levels & Deployment Templates.

Domain Specific IoTs: Home Automation – Cities – Environment – Energy – Retail -Logistics – Agriculture – Industry – Health & Lifestyle.

UNIT II

(15Hrs)

IoT and M2M: M2M - **Difference between IoT and M2M** – SDN and NFV for IoT: Software Defined Networking – **Network Function Virtualization.**

IoT System Management with NETCONF-YANG: Need for IoT Systems Management – SNMP: Limitations of SNMP – Network Operator Requirements – NETCONF – YANG – IoT Systems Management with NETCONF-YANG: NETOPEER.

UNIT III**(15 Hrs)**

IoT Platforms Design Methodology: Introduction - IoT Design Methodology – **Case Study on IoT System for Weather Monitoring.**IoT Systems Logical Design using Python: Introduction – Installing Python – Python **Datatypes and Data Structures** – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – **Python Packages of Interest for IoT.**

UNIT IV**(15Hrs)**

Intel Galileo and Intel Galileo Gen 2: Why Use Intel Galileo Boards? The Software Advantages - **The Hardware Advantages - Hardware Overview. Arduino IDE and Wiring Language:** Installing the Drivers and the Arduino IDE - Understanding the Arduino IDE - Checking the Port and Board Selected - What Is a Sketch? - **Debugging with Serial Console and Serial Communication** - The Arduino Language Reference and APIs - Running Some Examples - Updating the Firmware Using the IDE.

UNIT V**(14Hrs)**

IoT Physical Devices & Endpoints: **What is an IoT Device – Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi** – Raspberry Pi Interfaces – Programming Raspberry Pi with Python.

IoT Physical Servers & Cloud Offerings: **Introduction to Cloud Storage Models & Communication APIs** – WAMP – AutoBahn for IoT – Python Web Application Framework – Django - Amazon Web Services for IoT.

Text Book

S.No.	Authors	Title	Publishers	Year and Edition
1.	ArshdeepBahga, Vijay Madiseti	Internet of Things – A hands-on approach	Hyderabad : Universities Press	2016,1 st Edition
2.	Manoel Carlos Ramon,	Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers.	Apress	2014,1 st Edition

Reference Book

S.No	Author	Title of the Book	Publishers \Edition	Year and Edition
1	David Easley and Jon Kleinberg	Networks,Crowds,andMarkets:ReasoningAboutaHighlyConnectedWorld UnitedKingdom	Cambridge University Press.	2010, 1 st Edition
2	Honbo Zhou	The Internet of Things in the Cloud: A Middleware Perspective	CRC Press. New york	2012,1 st Edition
2	Francis daCosta,	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	1 st Edition, Apress Publications	2013, 1 st Edition

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer**Dr. R. Sivaranjani**

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
AI22C10	MACHINE LEARNING	THEORY	73	2	-	4

Preamble

This course has been designed to introduce the concepts and techniques of machine learning. It also emphasize various principles, algorithms, and applications of machine learning

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamentals of Machine Learning Concepts.	K1
CLO2	Understand the features of machine learning to apply on real world problems	K2
CLO3	Apply various algorithms of supervised and unsupervised learning	K3
CLO4	Analyze the concepts of linear and non-linear activation functions	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S

S- Strong; M-Medium.

MACHINE LEARNING - AI22C10

73 Hours

Unit I:

(14 Hrs)

The Machine Learning Landscape: Introduction to Machine Learning - Why Use Machine Learning? - Examples of Applications - Types of Machine Learning systems – Main Challenges of Machine Learning – Testing and Validating - Classification and Prediction - The Role of Python in Machine Learning - Anaconda in Python - Python Libraries.

Unit II

(15 Hrs)

Classification: MNIST - Training a Binary Classifier - Performance Measures: Measuring Accuracy Using Cross-Validation - Confusion Matrix - Precision and Recall - Precision/Recall Trade-off - The ROC Curve. Multiclass Classification - Multilabel Classification - Multi Output Classification – Classification Tree. **Advanced Machine Learning: Scikit-Learn Library for Machine Learning** - Cross-Validation. **Support Vector Machine: Linear SVM Classification – Nonlinear SVM Classification.**

Unit III

(15 Hrs)

Linear Regression: Simple Linear Regression – Steps in Building a Regression Model – Building Simple Linear Regression Model – Multiple Linear Regression: Developing Multiple Linear Regression Model Using Python – **Categorical Encoding Features - Splitting the Dataset into Train and Validation Sets -Building the Model on a Training Dataset** – Logistic Regression.

Unit IV**(14 Hrs)**

Unsupervised Learning Techniques: Clustering – K-Means Clustering – Limits of K-Means – Clustering for Image Segmentation - Clustering for Preprocessing - Clustering for Semi-Supervised Learning – DBSCAN – **Other Clustering Algorithm. Creating Product Segments Using Clustering - Hierarchical Clustering.**

Unit V**(15 Hrs)**

Forecasting: Forecasting Overview - Components of Time-Series Data. Recommender Systems: Overview – Association Rules – Applying Association Rules. Text Analytics: Overview – Sentiment Classification - **Naïve-Bayes Model for Sentiment Classification. Introduction to Artificial Neural Networks with Keras: From Biological to Artificial Neurons.** Deep Computer Vision Using Convolutional Neural Networks: Convolutional Layers.

Text Book

S.No.	Authors	Title	Publishers	Year and Edition
1	Manaranjan Pradhan, U Dinesh Kumar	Machine Learning using Python	Wiley India, First edition	2019, 1 st Edition
2	Aurelien Geron	Hands-On Machine Learning with Scikit Learn, Keras and Tensorflow Concepts Tools and Techniques to Build Intelligent Systems	OReilly Media, Second Edition	2019, 2 nd Edition

Reference Book

S.No	Author	Title of the Book	Publishers \Edition	Year and Edition
1	Tom M Mitchell	Machine Learning	Tata McGraw-Hill, New Delhi	2017, 1 st Edition
2	Anuradha Srinivasa Raghavan, Vincy Joseph	Machine Learning	Wiley India, First edition	2019, 1 st Edition
3	Zsolt Nagy	Artificial Intelligence and Machine Learning Fundamentals	Packt publisher	2018, 1 st Edition
4	Dr. S Sridhar Dr. M Vijayalakshmi	Machine Learning	Oxford University Press	2021, 1 st Edition

Pedagogy

Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Mrs. G. Rubadevi

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN21E01	CLOUD COMPUTING	THEORY	73	2	-	5

Preamble

Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the fundamentals of cloud computing, data center and cloud Environment	K1
CLO2	Understand the nature of the cloud, value of cloud for business, managing the data and cloud service	K2
CLO3	Apply the various cloud services like IaaS, PaaS and cloud environment	K3
CLO4	Analyze the Service-oriented architecture, cloud strategy, Virtualization	K4

Mapping with Programme learning outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	M	S	M	M	M
CLO2	S	M	S	S	S
CLO3	M	S	S	M	M
CLO4	S	S	M	S	S

S- Strong; M-Medium.

CLOUD COMPUTING- IN21E01

73 Hrs

Syllabus

UNIT I

(14 hrs)

Introduction cloud computing: Grasping the fundamentals- **Discovering the value of the cloud for business getting inside the cloud**-developing your cloud strategy.

UNIT II

(15 hrs)

Understanding the nature of the cloud-seeing the advantages of highly scaled data centre-**Exploring the technical foundation for scaling computer systems**-checking the cloud workload strategy – managing data.

UNIT III**(14 hrs)**Examining the cloud elements: **Seeing infrastructure as a service**-Exploring platform as service.**UNIT IV****(15 hrs)**Managing the cloud: **Managing and securing cloud service** – Governing the cloud – Virtualization and the cloud.**UNIT V****(15 hrs)**Managing the cloud: **Managing desktops and devices in the cloud- Service-oriented architecture and the cloud** – Managing the cloud environment.**Text Book**

S.No.	Authors	Title	Publishers	Year and Edition
1.	Judith Hurwitz, Robin Bloor Marcia Kaufman and Dr. Fernhalper	Cloud Computing For Dummies	Wiley India Publication Edition	2010, 1 st Edition

Reference Books

S.No	Author	Title of book	Publisher	Year and Edition
1	Prasant Kumar Pattnaik	Fundamentals of Cloud Computing	Vikas Publishing House	2014, 1 st Edition
2	Rajkumar Buyya., et.al	Cloud Computing: Principles and Paradigms	Wiley publications	2013, 1 st Edition

Pedagogy

- In Class lecture , PPT, Discussion, Assignment, Seminar ,Quiz.

Course Designer**Dr. G. Sangeetha**

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN21E02	WIRELESS SENSOR NETWORKS	THEORY	73	2	-	5

Preamble

The course is designed to understand about the networking sensor routing and networking database. Examine the essential sensor nodes, general issues and energy constraints. Learn the networking and sensor platform tools.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall the applications, platforms and tools of sensor network,	K1
CLO2	Understand the challenges in sensor network database, high level database organization	K2
CLO3	Apply the geographic and energy aware routing, collaborative processing and future research directions	K3
CLO4	Analyze the medium access control, temporal data and emerging applications	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	S	S
CLO2	M	S	S	M	S
CLO3	S	M	M	S	M
CLO4	M	S	S	M	S

S – Strong; M – Medium.

WIRELESS SENSOR NETWORKS- IN21E02

73 Hrs

Syllabus

UNIT 1

(14hrs)

Introduction: Unique Constraints and challenges of sensor network – Advantages of sensor Network – **Sensor Network Applications** – **Collaborative Processing** – Definition of Sensor Networks

UNIT II**(15hrs)**

Networking Sensors: Medium Access Control – **General issues - Geographic, Energy Aware Routing**
–Attribute Based Routing.

UNIT III**(15hrs)**

Sensor Network Database: challenges - **Querying the physical environment – High level database organization** –Network Aggregation -Data centric storage – Temporal Data.

UNIT IV**(15hrs)**

Sensor Network Platforms and Tools: Sensor node hardware – **Sensor Network Programming challenges** -Node level Software platforms – **Node level simulators.**

UNIT V**(14hrs)**

Application and future Directions: **Emerging Applications** - Future Research directions.

Text Books

S.NO	AUTHOR	TITLE OF BOOK	PUBLISHER	YEAR and EDITION
1	Fengzhao and Leonidas J. Guidas	Wireless Network- An Information processing Approach	Elesiver publication	2007,2 nd Edition

Reference Books

S.NO	AUTHOR	TITLE OF BOOK	PUBLISHER	YEAR and EDITION
1	Fengzhao and Leonidas J. Guidas	Wireless Sensor Network Design	John willey	2003,2 nd Edition
2	Kazemsohraby Daniel minoli and Taiedznati	Wireless sensor network- Technology Protocol and Design	John willey	2007,1 st Edition

Pedagogy

In Class lecture, PPT, Discussion, Assignment, Seminar, Quiz.

Course Designer

Mrs. G. Rubadevi

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN21E03	AUGMENTED REALITY/ VIRTUAL REALITY	THEORY	73	2	-	5

Preamble

The objective of this course is to provide a detailed understanding of the concepts of Augmented / Virtual Reality and its applications.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	To Recall fundamental concepts of computer vision, computer graphics and human-computer interaction techniques related to AR/VR.	K1
CLO2	To understand virtual environment and human factors in VR.	K2
CLO3	To apply various types of hardware and software in virtual Reality systems	K3
CLO4	Analyze and implement Augmented/ Virtual Reality applications.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	M	S	S	S	S
CLO4	S	S	M	S	M

S- Strong; M-Medium.

AUGMENTED REALITY / VIRTUAL REALITY - IN21E03 73 Hrs

Syllabus

UNIT I

(14 Hrs)

Augmented Reality: Taxonomy, Technology and features of augmented reality, **Difference between AR and VR**, Types Of AR, Challenges with AR, Advantages of AR, Ingredients of an Augmented Reality experience, **Visualization techniques for augmented reality**, Applying Augmented Reality to a problem.

UNIT II

(15 Hrs)

Virtual Reality Environment: Introduction, The Three I's of VR, **Computer graphics, Real time computer graphics, Flight Simulation, Virtual environment requirement**, Benefits of virtual reality, Historical development of VR. **3D Computer Graphics:** Introduction, The Virtual world space, positioning the virtual observer, the perspective projection, human vision, stereo perspective projection,

3D clipping, Colour theory, **Realism-Stereographic image.**

UNIT III

(14 Hrs)

VR Hardware: Introduction, Computers, Tracking, Input Devices, Output Devices, Glasses, Displays and Audio. **VR Software: Introduction, VR Software Features, Web-Based VR, Division's dVISE and Blueberry3D.**

UNIT IV

(15 Hrs)

Human Factors: Introduction, Vision, **Vision and Display Technology**, Hearing, Tactile, Cybersickness, VR and Society.

UNIT V

(15 Hrs)

Applications of AR and VR: Applications of AR in education, science, business, manufacturing and medicine. **Application of VR in Film and TV Production**, Military VR applications, **VR Technology in Robotics and Games.**

Text Book

S.No	Author	Title of book	Publisher	Year and Edition
1	John Vince	Introduction to Virtual Reality	Springer	2004, 1 st Edition
2	Alan B. Craig	Understanding Augmented Reality, Concepts and Applications	Morgan Kaufmann	2013, 1 st Edition

Reference Books

S.No	Author	Title of book	Publisher	Year and Edition
1.	Alan Craig, William Sherman and Jeffrey Will	Developing Virtual Reality Applications, Foundations of Effective Design	Morgan Kaufmann	2009, 1 st Edition
2.	Grigore C. Burdea, Philippe Coiffet	Virtual Reality Technology	Wiley	2016, 1 st Edition
3.	Anand R	Augmented and Virtual Reality	Khanna PublishingHouse	2010, 1 st Edition

Pedagogy

Chalk and talk, PPT, Group Discussion, Assignment

Course Designer

Dr. R. Jeevitha

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP5	PYTHON PROGRAMING LAB	Practical		-	75	3

Preamble

To implement python programs with conditional loops and represent compound data using Python List, Tuples, Sets, Packages and Modules and Dictionaries, read write data from/to files in Python.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Define the basic syntax and statements of Python programming.	K1
CLO2	Discuss the various functions and exception handling of python programming	K2
CLO3	Apply object-oriented programming concept in real time problems.	K3
CLO4	Analyze the data structures of list, tuples, dictionaries, Sets, Module and Packages and to develop the python application	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	M
CLO2	S	S	S	S	S
CLO3	S	S	M	M	M
CLO4	S	S	S	S	S

S- Strong; M-Medium.

PYTHON PROGRAMMING LAB –IN22CP5

75 Hours

- Exercises using data types and variables
- Exercise using Conditional statements
- Exercise based on looping statement
- Exercise using recursive function.
- Exercise on Strings
- Exercise on List and Tuple
- Exercise on Dictionaries
- Exercise on Modules and Packages
- Exercise Files handling
- Exercise on Exception handling.

Pedagogy

System, White board, Demonstration through PPT

Course Designer

Dr. R. Jeevitha

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN20SBCE	Coursera: PROGRAMMING IN PHP AND MYSQL	Theory	41	4	-	3

Coursera - Programming in PHP and MySQL

Course Contents

45 Hrs

- PHP Objects (3 hrs)
- Connecting PHP and MySQL (6 hrs)
- PHP Cookies and Sessions (3 hrs)
- PHP Redirect, Routing, and Authentication (6 hrs)
- Introduction to JavaScript and JavaScript Objects (10 hrs)
- Using JQuery (7 hrs)
- JSON - JavaScript Object Notation (9 hrs)

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22SBP3	SBS : III DATA VISUALIZATION TOOLS LAB	Practical	-	4	41	3

Preamble

This course is aimed for providing graphical representation for real time data using visualization tools. It facilitates the students to gain skills on geo spatial data visualization and to create dashboard.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Design bar chart and pie chart for real time data	K2
CLO2	Choose the right visualization tool for different data source	K2
CLO3	Develop geo map and symbol map for geospatial data	K3
CLO4	Construct dashboard for business data presentation and for decision making	K3

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

List of Programs- IN22SBP3

Exercises to be performed using data visualization tool.

1. Create a bar chart for the given data
2. Create a pie chart for the given data
3. Create a scatter chart for the given data
4. Create a time series chart for the given data
5. Create a histogram for the given data
6. Create a area chart for the given data
7. Create a heat map for the given data
8. Create a geo map for the given data
9. Create a filled map for the given data
10. Create a dashboard and format it
11. Create a boxplot for given data

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

Dr. S. Beula Princy

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
NM21CS1	CYBER SECURITY 1	Theory	30	-	-	Grade

Preamble

This course introduces fundamental concepts of Cyber Security in the digital era. It provides the knowledge of cybercrimes, cyber laws and also the security of digital devices. It helps to do secure digital transactions and safe usage of social media.

CYBER SECURITY

30 Hrs

Syllabus

Unit I

(6 Hrs)

Principles of Cyber security: Introduction to Cyber security - Defining cyberspace - Architecture of cyberspace - Communication and web technology - Internet infrastructure for data transfer and governance - Regulation of cyber space - Concept of Cyber security - Issue and challenges of cyber security.

Unit II

(6 Hrs)

Cyber Crime: Introduction to Cyber crime - Classification of Cyber-crimes – Cyber-crime against women and children – Financial frauds - Social engineering attacks – Malware - Zero day and zero click attacks.

Unit III

(6 Hrs)

Cyber Law: Cyber Criminals modus-operandi – Reporting of cybercrimes – remedial and mitigation measures – Legal perspective of cybercrime– IT Act 2000 and its amendments – Organization dealing with cyber crimes and cyber security in India.

Unit IV

(6 Hrs)

Social Media Security: Introduction to social network – Types of social media – Social media platform – Hashtag – Viral content – Security issues related to social media. – **Cyber Security tools:** Nmap – Introduction to Nmap – Nmap scan types- Nmap command list.

Digital Transaction: Introduction to digital payments – Components of digital payments – Modes of digital payments – Banking cards – UPI (Unified Payment Interface) – e-Wallets. (Aligned 90% with UGC)

Unit V

(6 Hrs)

Digital Devices Security: End point device and Mobile phone security – Password policy – Security patch management – Data backup – Device security policy – Cyber security best practices. Installation and configuration of Computer Anti-Virus.

Case studies: Illustrations of Financial frauds – Digital Signature. Prepare a checklist for secure net banking

Reference books:

1. Raef Meeuwisse , Cybersecurity For Beginners, Lulu Publishing Services,2nd Edition,2017
2. Scott Augenbaum, The Secret to Cybersecurity-A Simple Plan to Protect Your Family and Business from Cybercrime , Forefront Books Publisher,2019
3. Sumit Belapure and Nina GodBole, Cyber security understanding cyber crimes computer forensics and Legal perspectives, Wiley India Pvt Ltd, 2011
4. Christopher Hadnagy, Social Engineering: The Science of Human Hacking,Wiley Publisher, 2nd Edition,2018
5. Pavan Duggal, Artificial Intelligence, Cybercrimes & Cyberlaw,2018
6. Joe Gray, Practical Social Engineering: A Primer for the Ethical Hacker, 2022 Security in the digital age: social media security threads and vulnerabilities by Henry A. Oliver, Create Space Independence publishing platform.

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN16AC1	DATA MINING	Theory	-	-	-	5

Preamble

This paper helps the students to gain knowledge about various techniques used in variety of industries. Data mining has become an essential practice for maintaining a competitive edge in every phase of the customer life cycle. To understand various tools of Data Mining and their techniques to solve the real time problems

DATA MINING - IN16AC1

UNIT-I

Introduction -What is Data mining , Data mining -important Data mining -various kind of data Data mining Functionalities –Various kinds of Patterns Pattern Interesting Classification of Data mining Systems Data mining Task Primitives Integration of Data Mining System Major issues in Data Mining

UNIT-II

Data Processing -Process the Data Descriptive Data Summarization –Measuring Central Tendency Dispersion of Data Graphic Displays of –Basic Descriptive Data Summaries Data Cleaning. Data Integration and Transformation- data Reduction-Data Discrimination -Concept Hierarchy Generation.

UNIT-III

Data Warehouse OLAP Technology An overview -Data Warehouse Multidimensional Data Model, Data Warehouse Architecture- Data Warehouse Implementation From Data Warehouse to Data Mining

UNIT-IV

Mining –Frequent Patterns Associations Correlations -Basic Concepts Road Map Efficient Scalable Frequent Item set Mining methods Mining –Various Kinds of Association rules Analysis - Association mining to Correlation Constrain Based Association mining

UNIT-V

Applications Trends -Data mining Applications Data mining –System Products Research Prototype Additional Themes on Data Mining Social impact of Data mining Trends in Data mining.

Text Books

S.NO	AUTHOR	TITLE OFBOOK	PUBLISHER	YEAR OF PUBLICATION
1	Karguta, Joshi, Sivakumar	Data Mining	PHI	2007,1 st Edition
2.	Ian H. Witten &Eibe Frank	Data Mining	Morgan Kaufmann Publishers	2009,2 nd Edition

Reference Books

S.NO	AUTHOR	TITLE OF BOOK	PUBLISHER	YEAR OF PUBLICATION
1	Jiawei Han and MichelineKamber	Data Mining Concepts and Techniques	Morgan Kaufmann Publishers	An imprint of Elsevier
2.	N.P.Gopalan,B.Sivaselvan	Data Mining Techniques and Trends	PHI	2009,1 st Edition

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN16AC2	INFORMATION RETRIEVAL	Theory	-	-	-	5

Preamble

Understand the concepts of document representation, document indexing, digital information storage, retrieval, and distribution. Summarize the advantages and disadvantages of different information-retrieval design models. Translate vague information needs into specific queries that a given IR system can parse and execute correctly.

INFORMATION RETRIEVAL - IN16AC2

UNIT I

Boolean retrieval: Information retrieval problem - Processing Boolean queries - Boolean model versus ranked retrieval. The term vocabulary and postings lists: Document delineation and character sequence decoding - Determining the vocabulary of terms - Faster postings list intersection via skip pointers

UNIT II

Dictionaries and tolerant retrieval: Search structures for dictionaries - Wildcard queries - Spelling correction - Phonetic correction. Index construction: Hardware basics - Blocked sort-based indexing - Single-pass in-memory indexing - Distributed indexing - Dynamic indexing .

UNIT III

Scoring, term weighting and the vector space model: Parametric and zone indexes - Term frequency and weighting - The vector space model for scoring. Evaluation in information retrieval: Information retrieval system evaluation - Standard test collections - Evaluation of unranked retrieval sets -Evaluation of ranked retrieval results

UNIT IV

XML retrieval: Basic XML concepts - Challenges in XML retrieval - A vector space model for XML retrieval - Evaluation of XML retrieval - Text-centric vs. data-centric XML retrieval.

UNIT V

Text classification and Naive Bayes: The text classification problem - Naive Bayes text classification - Properties of Naive Bayes - Feature selection - Evaluation of text classification.

Text Book

S.NO	AUTHOR	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Christopher D. Manning, Prabhakar Raghavan, Henrich Schutze	Introduction to Information Retrieval	Cambridge University Press, New York, 1 st Edition	2008, 1 st Edition

Reference Books

S.NO	AUTHOR	TITLE OF BOOK	PUBLISHER	YEAR OF PUBLICATION
1	Stefan Butcher et.al	Information Retrieval - Implementing and Evaluating	MIT Press	2012, 1 st Edition
2	Dr Ricardo Baeza-Yates et.al	Modern Information Retrieval: The Concepts and Technology	Addison Wesley	2011, 1 st Edition
3	DavidA. Grossman and OphirFrieder	Information Retrieval	Universities Press, 2 nd Edition,	2010, 1 st Edition

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN21C11	SOFTWARE ENGINEERING AND TESTING	THEORY	73	2	-	4

Preamble

The course is designed to impact the knowledge on building reliable software products. It also emphasize various testing's undergone to enhance the quality of the software.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Recall about the software evolution, software engineering practice, life cycle models and testing concepts.	K1
CLO2	Understand on Agile models, various Phases of software Project and its life cycle models.	K2
CLO3	Apply the various building models, software testing tactics and its Methodologies.	K3
CLO4	Analyze the System, Acceptance and Performance Testing's criteria and its best practice.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	M	S	M	M
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S

S- Strong; M-Medium;

SOFTWARE ENGINEERING AND TESTING- IN21C11 73Hrs

Syllabus

UNIT I

14 hrs

Introduction to Software Engineering: The Evolving role of Software - **Software - Changing nature of Software - Legacy Software** - Software myths. Software Engineering Practice: Software engineering practice - Communication practices - Planning practices - Modeling practices - Construction practice-Deployment.

UNIT II

15 hrs

Software Development Life Cycle models: **Phases of Software project-Quality, Quality Assurance, Quality control** - Testing, Verification and Validation - Process Model to represent Different Phases - Life Cycle models.

UNIT III

15 hrs

Agile Development: Agile Process –Agile Process Model-Building the Analysis Model: Requirement Analysis - **Data Modeling concepts - Object Oriented Analysis -Flow Oriented Modeling-Design Engineering: Design concepts.**

UNIT IV**14 hrs**

Testing Tactics: Software Testing Fundamentals -Types of Testing: White Box Testing - Static Testing- Structural Testing-Black box Testing-**Integration Testing: Integration testing-Integration Testing as Type of Testing.**

UNIT V**15 hrs**

System and Acceptance Testing: System Testing Overview-**Functional testing versus Non-functional Testing-Functional testing - Non-functional Testing** – Acceptance Testing and its criteria –Performance Testing: Factors governing Performance testing.

Text Books

S.No	Authors	Title	Publishers	Year and Edition
1.	Roger S. Pressman	Software Engineering: A Practitioner's Approach	McGraw-Hill Education,	2011,6 th Edition
2.	Srinivasan Desikan , Gopalaswamy Ramesh	Software Testing Principles and Practices	Pearson Education	2012,1 st edfition

Reference Books

S.No	Authors	Title	Publishers	Year and Edition
1.	Rajib Mall	Fundamentals of Software Engineering	Prentice Hall of India Pvt Ltd,	2010,3 rd Edition
2.	Sandeep Desai, AbhishekSrivastava	Software Testing: A Practical Approach	PHI Learning Pvt. Ltd	2012,1 st Edition
3.	David Burns	Selenium 2 Testing Tools: Beginner's Guide	Tata MCGraw Hill Edition	2012,1 st Edition

Pedagogy

- Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Dr. R. Jeevitha

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22C12	ARTIFICIAL INTELLIGENCE OF THINGS	THEORY	73	2	-	4

Preamble

This course provides an overview of Artificial Intelligence of Things (AIoT), focusing on the integration of AI and IoT technologies. Students will gain foundational knowledge in AI and IoT and will explore their combined applications in real-world scenarios.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Understand the fundamental principles of AI and IoT.	K1
CLO2	Design AI techniques can be applied in IoT environments to enhance decision-making, automation, and analytics.	K2
CLO3	Develop web services to access/control IoT devices.	K3
CLO4	Explore practical applications of AIoT across various industries.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	S	M	S
CLO2	S	S	S	M	S
CLO3	S	S	M	S	S
CLO4	S	S	M	M	S

S- Strong; M-Medium;

ARTIFICIAL INTELLIGENCE OF THINGS- IN22C12 73 Hrs

Syllabus

UNIT I:

14Hrs

Artificial Intelligence (AI): **Introduction To AI: Definition of AI, History, and Evolution –Intelligent Agents-Solving Problems By Searching: Uninformed And Informed Search Strategies- Heuristic Functions-Local Search Algorithms and Optimization Problems- Adversial Search: Games-Optimal Decisions In Games-Alpha-Beta Pruning. Constraint Satisfaction Problems**

UNIT II:

15Hrs

Artificial Intelligence Of Things: Internet of Things- Artificial Intelligence-Artificial Intelligence of Things-Applications-The Convergence of AIoT -AIoT Architecture: Mobile Edge Computing Module- AI Module. Communication and Networks: AI Usage In Communication Systems. Existing Challenges And Issues-Security In AIoT Networks

UNIT III:

15 Hrs

Networking And Protocols For AIoT Networks: AIoT Networking Stack -AIoT Computing Layers: Device Layer-

Network Layer- Cloud Layer- Application Layer.

AIoT Protocols: Machine Learning Algorithms -Deep Learning Algorithms -Reinforcement Learning. **AIoT Communication Protocols:** MQTT -CoAP (Constrained Application Protocol) -AMQP (Advanced Message Queuing Protocol)- DDS (Data Distribution Service)

UNIT IV:

15Hrs

AIoT Application Development- The Impact Of AIoT On Connectivity -Benefits Of AIoT Application Development -AIoT Application Development Trends -Key Components Of AIoT Applications -Challenges In AIoT Application Development - **AIoT Application Development Platforms And Tools-Steps To Develop An AIoT Application.**

UNIT V

14Hrs

AIoT Applications And Services- Introduction - **Artificial Intelligence In IoT Applications:** AI Usage In AIoT Networks- Biometrics – Artificial Intelligence In Vehicles -AI Enabled Voice Assistants-Robots-Smart Devices - Automobiles - Smart Transport and AIoT -Smart Healthcare And AIoT -Ecological Smart Farming and AIoT - Automation and Computer Vision In AIoT- **Cyber Security In AIoT**

Text Book

Web Link: <https://www.iot83.com/blog-posts/the-future-of-connectivity-exploring-aiot-application-development>

S.No.	Authors	Title	Publishers	Year and Edition
1.	Stuart Russell and Peter Norvig	Artificial Intelligence: A Modern Approach	Hyderabad : Universities Press	2020 ,4 th Edition
2.	Kashif Naseer Qureshi and Thomas Newe	Artificial Intelligence of Things (AIoT)New Standards, Technologies and Communication Systems	Taylor & Francis Group, LLC	2024, Ist Edition

Reference Book

S.No	Author	Title of the Book	Publishers \Edition	Year and Edition
1	Honbo Zhou	The Internet of Things in the Cloud: A Middleware Perspective	CRC Press. New york	2012
2	Francis daCosta,	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	Apress Publications	2013,1 st Edition

Pedagogy

- Chalk and talk PPT, Discussion, Assignment, Demo, Quiz, Case study.

Course Designer

Mrs.V.Deepa

Mrs.G.Rubadevi

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN21C13	FULL STACK WEB DEVELOPMENT	THEORY	73	2	-	3

Preamble

This course gives the basic principle, strategies and methodologies of Full Stack web development. The Course is designed to develop dynamic web page using scripting languages and various styles with HTML, XML and jQuery for web application

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1.	Recall about the basics of HTML, XML, CSS, Scriting application language.	K1
CLO2.	Understand the various designing concept for dynamic presentation effect in HTML and XML documents.	K2
CLO3.	Apply the mark-up languages and Scripting languages for processing, identifying and presenting information in web pages with JQuery.	K3
CLO4.	Analyze the web page design requirements and design web pages using JQuery built in plug-ins.	K4

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1.	S	M	S	M	S
CLO2.	S	S	S	M	S
CLO3.	M	S	M	M	M
CLO4.	M	S	S	S	S

S- Strong; M-Medium;

Syllabus-Full Web Stack Development - 73 Hours

UNIT I:

14 Hrs

Fundamentals of HTML:-Understanding Elements: Root Elements-**Metadata Elements Section Elements**-Heading Elements. **Describing data types.**

UNIT II:

15 Hrs

HTML 5: HTML5 and its essentials-**Exploring New Features of HTML5**-Next Generation of Web Development-Structuring a HTML Document-Exploring Editors and Browsers Supported by HTML5- Creating and Saving a HTML Document-Validating a HTML Document-**Viewing an HTML Document-Hosting Web Pages.**

UNIT III:

14Hrs

Extensible mark-up language (xml): Introduction- HTML vs. XML- Syntax of the XML Document**XML Attributes- XML Validation- XML DTD-** The Building Blocks of XML

Documents-DTD Elements - DTD Attributes- DTD Entities- DTD Validation –XSL - **XSL Transformation- XML Namespaces- XML Schema.**

UNIT IV:

15 Hrs

INTRODUCTION TO JQUERY - What jQuery Can Do for You - **Who Develops jQuery? - Obtaining jQuery** - Installing jQuery - Programming Conventions – **EVENTS - The Various Event Wrapper Methods** - Attaching Other Events - **MANIPULATING CONTENT AND ATTRIBUTES** - Manipulating HTML and Text Content

UNIT V:

15 Hrs

CSS – AJAX - **Making a Server Request-** Loading HTML Snippets from the Server – **PLUGINS - Writing a Plugin** - Good Practice for jQuery Plugin Development - HTML5 DRAG AND DROP - Implementing Drag-and-Drop File Uploads.

Text Books

S.No	Author	Title of book	Publisher	Year and Edition
1.	Kogent Learning Solutions Inc	HTML5 BlackBook	Dreamtech Press	2011,1 st Edition
2.	N.P.Gopalan, J.Akilandeswari	Web Technology A Developer’s-Perspective	PHI Learning Pvt.,Ltd	2011, 4 th Edition
3.	Richard York	Web Development With JQUERY	John Wiley & Sons, Inc	2015, 2nd Edition

Reference Books

S.No	Author	Title of book	Publisher	Year and Edition
1	AkankshaRastogi	Web Technology	K.Nath& Co Educational Publishers	2012, 1 st Edition
2.	AnuranjanMisra, Arjun Kumar Singh	Intoduction to Web Technology	Laxmi Publication	2011, 1 st Edition
3.	C.Xavier	World Wide Web Design with HTML	TMH Publishers	2008, 1 st Edition
4.	Ray Rischpater	JavaScript JSON Cookbook	Packt Publishing Ltd.	2015, 1 st Edition

Pedagogy

- Lecture, Group Discussion, PPT

Course Designer

Dr.G.Sangeetha

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22CP6	IoT and FSW LAB	PRACTICAL	-	-	75	3

Preamble

The course is designed to develop IoT based applications using structured and object oriented programming with the help of Arduino / Raspberry Pi boards. It covers the overall concepts of Interface, Sensor and Network together. And it also gives knowledge to install and configure R tool for an analytics programming environment and gain basic analytics skills via this high-level analytical language.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Defining the basic concepts of IoT in embedded devices.	K1
CLO2	Discussing on the IoT applications for connecting into communication modules	K2
CLO3	Analyzing the networks in current area using sensors.	K3
CLO4	Applying the interface concepts for developing IoT applications on different devices.	K4

Mapping with Programme Learning Outcomes

S- Strong; M-Medium ; L-Low

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	S	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	M	S
CLO4	S	S	S	S	S

IoT LAB- IN22CP6

75 Hours

Program List

ARDUINO:

- Write a program to sense the available networks in your computer using Arduino.
- Write a program to measure the distance using ultra sonic sensor and make LED Blink using Arduino.
- Write a program to detect the vibration using vibration sensor using Arduino.
- Write a program to connect with the available wifi using Arduino.
- Write a program to sense a finger when it is placed in board Arduino.
- Write a program to get temperature notification using Arduino.
- Write a program for LDR to vary the light intensity of LED using Arduino.

RASPBERRY PI:

- Write a python program to get 10 numbers from the user and display the numbers in odd and even form separately in Raspberry pi.

FSW

Write a program to create a simple webpage using HTML.

Write a program to create a website using HTML CSS and JavaScript.

Write a program to build a Chat module using HTML CSS and JavaScript.

Write a program to create a simple calculator Application using React JS.

Pedagogy

- Demonstration of working environment/Tools/Software/Program

Course Designer

Dr.R.Jeevitha

Course Code	Course Name	Category	L	T	P	Credit
IN22AC3	ROBOTIC PROCESS AUTOMATION	Theory	-	-	-	5

Objective

Robotic Process Automation aims to provide a comprehensive understanding of RPA technologies, methodologies, and their applications across various industries. This paper helps the students to acquire knowledge on robotic process automation, concepts, workflows, and automation tools. Students will explore real-world case studies, best practices, and the challenges associated with bot deployment.

ROBOTIC PROCESS AUTOMATION - IN22AC3 Syllabus

Unit I

RPA Foundations: RPA -History of RPA- Benefits of RPA- Downsides of RPA-RPA Compared to BPO, BPM, and BPA - Consumer Willingness for Automation- The Workforce of the Future- RPA Skills: On-Premises Vs. the Cloud- OCR - Web Technology- Programming Languages and Low Code- Automation- Waterfall, Agile, Scrum, Kanban and -DevOps.

Unit II

Process Methodologies – Lean -Six Sigma –Implementation of Six Sigma –Roles and levels of Six Sigma – Applying Lean and Six Sigma to RPA – Planning: RPA consulting – ROI for RPA –RPA use cases.

Unit III

Bot Development–Preliminaries-Installation of UiPath - Getting Started-Activities - Flowcharts and Sequences - Log Message -Variables - Loops and Conditionals - For Each Loop - Do While Loop and While Loop-IF/THEN/ELSE Conditionals -Switch-Debug-Common UiPath Functions

Unit IV

Email Automation - Move e-mails to another folder-Mark e-mail as read or unread - Save attachments and e-mails. Word Automation - Save document as a different file-Read text from a document- Export a word document as pdf. Excel automation: Write values into cells - Read values from cells- Save an excel file indifferent formats (Pdfs, CSV).

Unit V

RPA vendors - Comparison of RPA Tools : UiPath - Automation Anywhere - Blue Prism Tool – Kofax – Open Source RPA –Business model of Open Source –Pros and cons of Open Source Software - OpenRPA –ULVision –Robot Framework –Robocorp.

Text Books

S.No	Author	Title of the Book	Publishers	Year oand Edition
1	Tom Taulli	The Robotic Process Automation Handbook-A Guide to Implementing RPA Systems	Apress	2020 , 1 st Edition
2	Adeel Javed, Anum Sundrani, Nadia Malik, Sidney Madison Prescott	Robotic Process Automation using UiPath StudioX: A Citizen Developer's Guide to Hyperautomation	Apress	2021 ,1 st Edition

Reference Books

S.No	Author	Title of the Book	Publishers	Year of Publication
1	NandanMullakara and Arun Kumar Asokan	Robotic Process Automation Projects	Packt Publishing	2020, 2 nd Edition
2	Dr. Jisu Elsa Jacob and Manjunath N	Robotics Simplified	BPB Publications	2022, 1 st Edition
3	Arun Kumar Asokan	UiPath Administration and Support Guide	Packt Publishing	2022, 1 st Edition

Pedagogy

- Lectures, Group discussions, Demonstrations, Case studies.

Course Designer

Dr. P. Parvathi.

COURSE CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN18AC4	BIG DATA ANALYTICS	Theory	-	-	-	5

Objective

This Course deals with the Basics of Big Data and Hadoop architecture. It deals with working of MapReduce and Query Model of NoSQL Databases. It also includes the Advantages of MongoDB.

BIG DATA ANALYTICS – IN18AC4

UNIT – I

Overview of Big Data: Defining Big Data - Big Data Types – Big Data Analytics – Industry Examples of Big Data - Big Data and Data Risk – Big Data Technologies – Benefits of Big Data.

UNIT- II

Basics of Hadoop: Big Data and Hadoop – Hadoop Architecture – Main Components of Hadoop Framework – Analysing Big Data with Hadoop – Benefits of Distributed Applications – Hadoop Distributed File System – Advantages of Hadoop – Ten Big Hadoop Platforms.

UNIT-III

MapReduce: Introduction to MapReduce –Working of MapReduce – Map operations – MapReduce User Interfaces.

UNIT-IV

NoSQL Databases: NoSQL Data Management – Types of NoSQL Databases – Query Model for Big Data – Benefits of NoSQL – MongoDB – Advantages of MongoDB over RDBMS – Replication in MongoDB.

UNIT- V

HBase, CASSANDRA and JAQL: Introduction to HBase – Row-oriented and Column-oriented Data Stores – HDFS Vs HBase – Hbase Architecture – HBase Data Model – Introduction to Cassandra –Features of Cassandra . Introduction to JAQL – JSON – Components of JAQL.

Text Book

S.No	Author	Title of Book	Publisher	Year of Publication
1	V.K. Jain	Big Data and Hadoop	Khanna Book Publishing	2017

Reference Books

S.No	Author	Title of Book	Publisher	Year of Publication
1	Frank J Ohlhorst	Big Data Analytics: Turning Big Data into Big Money	Wiley and SAS Business Series	2012
2	Anand Rajaraman, Jeffrey David Ullman	Mining of Massive Datasets	Cambridge University Press	2012
3	Paul Zikopoulos, Chris Eaton, Paul Zikopoulos	Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data	Tata McGraw Hill	2011

COURSE NUMBER	COURSE NAME	CATEGORY	L	T	P	CREDIT
IN22SBP3	SBS : III DATA VISUALIZATION TOOLS LAB	Practical	-	4	41	3

Preamble

This course is aimed for providing graphical representation for real time data using visualization tools. It facilitates the students to gain skills on geo spatial data visualization and to create dashboard.

Course Learning Outcomes

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

CLO Number	CLO Statement	Knowledge Level
CLO1	Design bar chart and pie chart for real time data	K2
CLO2	Choose the right visualization tool for different data source	K2
CLO3	Develop geo map and symbol map for geospatial data	K3
CLO4	Construct dashboard for business data presentation and for decision making	K3

Mapping with Programme Learning Outcomes

CLOs	PLO1	PLO2	PLO3	PLO4	PLO5
CLO1	S	M	M	S	S
CLO2	S	S	S	S	S
CLO3	S	S	M	S	S
CLO4	S	S	S	S	S

S- Strong; M-Medium; L-Low

List of Programs- IN22SBP3

Exercises to be performed using data visualization tool.

1. Create a bar chart for the given data
2. Create a pie chart for the given data
3. Create a scatter chart for the given data
4. Create a time series chart for the given data
5. Create a histogram for the given data
6. Create a area chart for the given data
7. Create a heat map for the given data
8. Create a geo map for the given data
9. Create a filled map for the given data
10. Create a dashboard and format it
11. Create a boxplot for given data

Pedagogy

- Demonstration of working environment / Tools / Software / Program

Course Designers

Dr. S. Beula Princy