UNDER GRADUATE PROGRAMME - COMPUTER APPLICATIONS
CHOICE BASED CREDIT SYSTEM (CBCS PATTERN)
(FOR THE CANDIDATES ADMITTED FROM 2023-24 ONWARDS)

SEMESTER	PART	COURSE CODE	TITLE OF THE COURSE	NATURE OF THE COURSE	IH	CP	EXAM DURATION	MARKS		TOTAL
								CIA	ESE	
I	Part I	23UTAM101/ 23UHIN101/ 23UFRE101	Tamil Course – I / Hindi Course – I / French Course - I	LAN	6	3	3	25	75	100
	Part II	23UENG101/ 23UAEN101	General English Course – I / Advanced English Course - I	ENG	6	3	3	25	75	100
	Part III	23UCA1C01	Core: C Programming	CC	5	5	3	25	75	100
		23UCA1CP1	Core Practical: Office Automation and C Programming ***(Skill Development)***	CC	6	3	3	25	75	100
		23UMA1A13	Allied: Numerical Methods	GEN	5	4	3	20	55	75
	Part IV	15UVAL101	Value Education	AEC	2	2	2	-	50	50
II	Part I	23UTAM202/ 23UHIN202/ 23UFRE202	Tamil Course – II /Hindi Course – II /French Course – II	LAN	6	3	3	25	75	100
	Part II	23UENG202/ 23UAEN202	General English Course – II / Advanced English Course – II	ENG	6	3	3	25	75	100
	Part III	23UCA2C02	Core: Computer System Architecture	CC	4	4	3	25	75	100
		23UCA2C03/ 23UCS2C03/ 23UIT2C03	Core: Python Programming ***(Employability,Skill Development)***	CC	4	4	3	25	75	100

		23UCA2CP2	Core Practical: Python Programming ***(Employability, Skill Development)***	CC	3	2	3	25	75	100
		23UMA2A12	Allied: Operations Research	GEN	5	4	3	20	55	75
	Part IV	21UENS202	Environmental Studies	AEC	2	2	2	-	50	50
III	Part III	23UTAM101/ 23UHIN101/ 23UFRE101	Tamil Course – III / Hindi Course – III / French Course – III	LAN	4	3	3	25	75	100
		23UENG101/ 23UAEN101	General English Course – III / Advanced English Course - III	ENG	4	3	3	25	75	100
		23UCA3C04	Core: Data Structures and Algorithms ***(Skill Development)***	CC	4	4	3	20	55	75
		23UCA3C05/ 23UCS3C05	Core: Java Programming ***(Employability)***	CC	4	4	3	20	55	75
		23UCA3CP3	Core Practical: Java and Data Structures ***(Employability, Skill Development)***	CC	4	2	3	20	55	75
		23UBA3A03	Allied: Financial and Management Accounting	GEN	5	4	3	20	55	75
	Part IV	22UBTA301/ 22UATA301	Basic Tamil/Advanced Tamil	AEC	2	2	2	25	25	50
		21UGEA303	General Awareness					-	50	
		23UCA3SB1	Skill Based: Multimedia Lab ***(Employability, Entrepreneurship, Skill Development)***	SEC	3	2	3	25	75	100
		21UNCCWS1	Women Studies	AEC	2	-	2	-	50	50
IV	Part III	23UTAM101/ 23UHIN101/ 23UFRE101	Tamil Course – IV / Hindi Course – IV / French Course – IV	LAN	4	3	3	25	75	100

		23UENG101/ 23UAEN101	General English Course – III / Advanced English Course - III	ENG	4	3	3	25	75	100
		23UCA4C06	Core: Modern Operating Systems	CC	4	4	3	20	55	75
		23UCA4C07	Core: PHP Programming ***Employability, Entrepreneurship, Skill Development)***	CC	4	4	3	20	55	75
		23UCA4CP4	Core Practical: PHP Programming ***(Employability, Entrepreneurship, Skill Development)***	CC	4	2	3	20	55	75
		23UBA4A04	Allied: Marketing Management	GEN	5	4	3	20	55	75
	Part IV	22UBTA301/ 22UATA301 21UHUR404	Basic Tamil/Advanced Tamil/Non-major Elective (Human Rights)	AEC	2	2	2	25 -	25 50	50
		23UCA4SB2	Skill Based Practical: Operating Systems Lab ***(Skill Development)***	SEC	3	2	3	25	75	100
V	Part III	23UCA5C08	Core: Network Communication and Security ***(Employability, Skill Development)***	CC	5	5	3	20	55	75
		23UCA5C09/ 23UCS5C09	Core: Relational Database Management System ***(Skill Development)***	CC	5	5	3	20	55	75
		23UCA5CP5/ 23UCS5CP5	Core Practical: Relational Database management System ***(Skill Development)***	CC	5	3	3	20	55	75
		23UCA5E01/ 23UCA5E02	Elective: Artificial Intelligence and Expert Systems ***IND 4.0*** / Data Science (***Employability***)	DSE	5	4	3	25	75	100

		23NCA5E01	NME: Mobile Computing	GE	4	4	3	25	75	100
	Part IV	23UCA5SB3	Skill Based: Android Applications Lab ***INDUSTRY 4.0 (Employability, Skill Development)***	SEC	3	2	3	25	75	100
		23UCASB03	Inter disciplinary Skill Based:Illustrative Designing Lab ***(Skill Development)***	SEC	3	2	3	25	75	100
		23UCA6C10/ 23UCS6C10	Core: Software Engineering (***Employability,Entrepreneurship)***	CC	4	4	3	20	55	75
VI	PART III	23UCA6C11	Core: Programming in .Net***(Employability)***	CC	5	5	3	20	55	75
		23UCA6CP6	Core Practical: Programming in .Net ***(Employability,Skill Development)***	CC	5	3	3	20	55	75
		23UCA6E01/ 23UCA6E02	Elective: Internet of Things (***IND 4.0***) (***Employability***)/ Digital Marketing ***(Entrepreneurship)***	DSE	5	4	3	25	75	100
		23UCA6PVV	Project	CC	5	4	3	25	75	100
	Part IV	23UCA6SB4	Skill Based: Testing Lab ***(Employability, Skill Development)***	SEC	3	2	3	25	75	100
		23UCASB03	Inter disciplinary Skill Based:Illustrative Designing Lab ***(Skill Development)***	SEC	3	2	3	25	75	100
		19UCYS605	Cyber Security		2	2	2	-	50	50
	Part V		Co-curricular activities (NSS/NCC/YRC/ SPORTS/RSP/ NECTAR /AICUF/ CHETNA WOMEN CELL)			1	-	-	-	50
			MOOC / SWAYAM / NPTEL			2				

	GRAND TOTAL		**Total**		**180+ 2+2**	**140+ 2+2**				**3800 + 50**

IH - Instructional Hours, CP- Credit Points
CIA – Continuous Internal Assessment, ESE – End Semester Examination

SEMESTER: I

COURSE CODE: 23UCA1C01

TITLE OF THE COURSE: CORE: C PROGRAMMING

COURSE OBJECTIVES:

- To inculcate the domain knowledge of C Programming with real time examples.
- To formulate the student's ability in modular structured programming.

COURSE OUTCOMES

At the end of the Course the students will be able to:

CO1	Illustrate the basic Concepts of C programming.	**K2**
CO2	Implement C program using Expressions with I/O Operations.	**K3**
CO3	Demonstrate the types of flow Control statements such as Branching and Looping.	**K3**
CO4	Discuss the logic of modular programming with derived data types and user defined functions.	**K2**
CO5	Implement C programs for data storage using pointers and File Concept.	**K3**

Syllabus

Total Credits - 5 **Instructional Hours - 75**

UNIT–I: Introduction to Programming Concepts (K2) **15 hours**

History of C - Importance of C - Basic Structure of C Programs - Executing C Program - Character Set - C Tokens - Keywords and Identifiers - Constants - Variables - Data Types - Declaration of Variables - Assigning Values to Variables - Defining Symbolic Constants - Declaring Variable as Constant - Declaring Variable as Volatile.

UNIT–II: I/O Operations (K3) **15 hours**

Types of Operators - Arithmetic Expressions- Evaluation of Expression – Precedence of Arithmetic Operators - Type Conversion in Expression - Operator Precedence and Associativity - Mathematical Functions - Reading and Writing a Character – Formatted Input/Output.

UNIT–III: Control Structures (K3) **15 hours**

Decision Making with IF Statement – Simple If Statement – If… Else – Nesting of If – Else If Ladder – Switch Statement – Ternary Operator – Goto Statement - While Statement – Do Statement – For Statement- Jumps in Loops.

UNIT-IV: Advanced Modular Concepts (K2) **15 hours**

Declaring and Initializing Arrays - Multidimensional Arrays – Dynamic Arrays - Declaring and Initializing String Variables - Reading and Writing Strings- Arithmetic Operation on Characters – Putting Strings together – Comparison of two Strings – String Handling Functions – Elements of User Defined Functions - Definition of Function - Return Values and their Types - Function Calls - Function Declaration - Category of Functions - Recursion - Scope of Variables - Visibility and Lifetime of Variables.

(Self Study: Multidimensional Arrays, Dynamic Arrays)

UNIT-V: Complex Data Storage (K3) **15 hours**

Defining a Structure - Declaring Structure Variables - Accessing Structure Members - Structure Initialization - Arrays of Structure – Arrays within Structure - Structure within Structure – Union - Understanding Pointers - Accessing address - Declaring Pointer Variables - Initialization of Pointer Variable - Accessing Variable through its Pointer - Defining File - Opening and Closing File – Input/Output Operations on File – Random Access Files - Command Line Arguments.

(Beyond the Curriculum: Mapping files into memory, Localizing the name of directory, Dynamic Memory Allocation)

TEXT BOOK

1. Balagurusamy E (2012), Programming in ANSI C (6th Edition), Tata Mc Graw Hill Publications,India.

REFERENCE BOOKS

1. Ashok N Kamthane (2005), Programming in ANSI and TURBO C (5th Edition), Indian Re-print, Pearson Education,India.
2. Yashavant P Kanetkar (2015), Let Us C (13th Edition), BPB Publications,India.
3. Brain W Kernighan, Dennis M Ritche (2015), The C Programming Language, Prentice Hall Software Series Publications,Canada.
4. Byron S Gottfried(2007), Programming with C (2nd Edition), Tata Mc Graw Hill Publications, United States.

BLENDED LEARNING

UNIT V: COMPLEX DATA STORAGE

Topics	Link
Declaring a structure	https://youtu.be/Ranc3VvjI88
Declaring a structure variable	https://youtu.be/3pFSbSVIwKU
Accessing structure members	https://youtu.be/2DidKZmwNMo
Structure initialization	https://youtu.be/A4-b3pbAruI
Arrays of structure	https://youtu.be/3LQTxwKZAOY
Arrays within structures	https://youtu.be/vL83MEFnRG4
Understanding pointers	https://youtu.be/mw1qsMieK5c
Accessing and declaring pointer variable	https://youtu.be/rfII6_8AoXw
Defining file- opening and closing file	https://youtu.be/_KW_YBTXhN0
I/O operations on file	https://youtu.be/dNezzCg6mNo
Random access files	https://youtu.be/Arh-afgeUqA
Command line arguments	https://youtu.be/JArmogmRCcg

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	2	2		2	2		3	3	3
CO2	3	3	3				2	2	3		2	3	3	2
CO3	3	3	3	2	3			2	3		2	3	3	2
CO4	3	3	3	2	3	2			3	3	3	3	3	3
CO5	3	3	3	2	3	2			2		2	3	3	2

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency of Assessment
1.	End Semester Examination	Once in a semester
2.	CIA I	Once in a semester
3.	CIA II	Once in a semester
4.	Model	Once in a semester
5.	Assignment (Unit I &II)	Twice in a semester
6.	Seminar (Unit III & IV)	Twice in a Semester
7.	Workshop (Unit V)	Once in a semester

Course Designed by: Dr.S. BeulaPrincy	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

Dr.S.THAVAMANI Dr.D.SHANMUGA PRIYAA Dr.K.JULIANA GNANASELVI Dr.T.DEEPA Mr.K. BOOPATHIKUMAR

SEMESTER: I

COURSE CODE: 23UCA1CP1

TITLE OF THE COURSE: CORE PRACTICAL: OFFICE AUTOMATION AND C PROGRAMMING

(Skill Development)

COURSE OBJECTIVES:

- To develop the basic programming skills in C.
- To explore knowledge in Office Automation.

COURSE OUTCOMES

At the end of the Course the students will be able to:

CO1	Apply the basic concepts of office automation.	**K3**
CO2	Illustrate the basic concepts of c programming using exceptions with i/o operations and control statements.	**K3**
CO3	Record: Implement programs and present result	**K3**

Total Credits-3 **Instructional Hours - 90**

LIST OF PRACTICALS

OFFICE AUTOMATION

1. Create a news-paper document with at least 200words,
    a. Use margins as, top:1.5, bottom:2, left:2, right:1inches.
    b. Use heading "Gandhi Jayanti", font size: 16, font color: red, font face: Arial Black.
    c. With first letter "dropped" (use drop cap option) of the first paragraph containing a picture at the right side
    d. Use three columns from the second paragraph onwards till the half of the page.
    e. Use heading "Computer basics"
    f. Create paragraph using two columns till the end of the page.
2. Create a table "Student result" with following conditions.
    a. The heading must contain, Sl. No., Name, Mark1, Mark2, Mark3, Total, average and result with manual entry.
    b. Use formulas for total and average.
    c. Find the name of the students who has secured the highest and lowest marks.
    d. Round the average to the nearest highest integer and lowest integer (use ceiling and floor function respectively).
3. Create a document about any topic in mathematics which uses mathematical symbols. At least 5 mathematical symbols should be used. Assign a password for the document to protect it from unauthorized access. Demonstrate the use of Hyperlink Option.
4. Create a sales table using the following data,

Item	Year1	Year2	Year3	Year4
Item1	1000	1050	1100	1200
Item2	950	1050	1150	1200
Item3	1100	1200	1200	1300

    a. Draw the bar-graph to compare the sales of the three items for four years using insert option.
    b. Draw a line-graph to compare the sales of three items for four years using insert option.

c. Draw different pie-charts for the given data using insert option.

d. Use condition, to highlight all the cells having value >=1000 with red color (use conditional formatting).

5. Create a power-point presentation with minimum 5 slides.
   a. The first slide must contain the topic of the presentation and name of the presentation.
   b. Must contain at least one table.
   c. Must contain at least 5 bullets, 5numbers.
   d. The heading must be, font size:32, font-face: Arial Rounded MT Bold, font-color:blue.
   e. The body must be, font size: 24, font-face: Comic Sans MS, font-color: green.
   f. Last slide must contain „thank you".
6. Create a database "Student" with,
   a. At least one table named "mark sheet" with field name "student name, roll number, mark1, mark2, mark3, mark4, total"
   b. The data types are, student name: text, roll number: number, mark1 to mark4: number, total: number. Roll number must be the primary key.
   c. Enter data in the table. The total must be calculated using update query.
   d. Use query for sorting the table according to the descending/ascending order of the total marks.
7. Create a group mail and perform the following activities.
   i. Compose and send e-mail using bcc, cc option to group members.
   ii. Reply to the mail with an attachment
   iii. Download the attached document of a mail received.

C PROGRAMMING

1. Create a program to perform arithmetic operations using different data types.
2. Create a program using decision making statement.
3. Create a program using loop statement.
4. Create a program using string functions.
5. Create a program to perform matrix addition using two dimensional arrays.

6. Create a program to print the students mark sheet with register number, name and marks in five subjects using structure.
7. Create a program to swap two numbers using Pointers.
8. Create a program to perform File Operations**.**

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	2	2	2	2			2	3	2		
CO2	3	3	3				2	2	3		2	3	3	2
CO3	3	3	3	2				2	3		2	3	3	2
CO4	3	3	3	2	2	2			2	3	3	2	2	2
CO5	3	3	3	2	3	2			2		2	3	3	2

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by: Ms.M.Judith Acquline	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

Dr.S.THAVAMANI Dr.D.SHANMUGA PRIYAA Dr.K.JULIANA GNANASELVI Dr.T.DEEPA Mr.K. BOOPATHIKUMAR

SEMESTER: II

COURSE CODE: 23UCA2C02

TITLE OF THE COURSE: CORE - COMPUTER SYSTEM ARCHITECTURE

COURSE OBJECTIVES:

- To learn about Computer Fundamentals and its Architecture.

- To provide a strong foundation in understanding the concept of digital number system and logical circuits.
- To have a deep knowledge on Combinational Circuits, I/O organization and Memory.

COURSE OUTCOMES

At the end of the course the student will be able to:

CO1	Illustrate the conversion among various number systems	**K2**
CO2	Discuss combinational logic design using gates and perform simplifications using Boolean algebra.	**K2**
CO3	Infer Combinational and Sequential Circuits	**K2**
CO4	Compare the different ways of communication with standard I/O Organization.	**K2**
CO5	Distinguish the various memory organization for I/O operations.	**K2**

Syllabus

Total Credits- 4 **Instructional Hours- 60**

UNIT-I: NUMBER SYSTEMS AND CODES (K2) **12 hours**

Number Systems: Decimal, Binary, Octal, Hexadecimal and their inter conversions – Binary Operations – Floating Point Representation - Complements - BCD - Excess 3 Code - Gray Code.

UNIT-II: BOOLEAN ALGEBRA AND LOGIC DESIGN (K2) **12 hours**

Basic gates: NOT, OR, AND, Universal gates: NAND and NOR gates, Other gates: XOR, XNOR gates, Boolean Algebra: Karnaugh Map – Canonical Form1 – Construction and Properties – Implicants – Don't Care Combination – Sum of Products - Product of Sums.

(Self Study: Basic Logic Gates)

UNIT-III: COMBINATIONAL AND SEQUENTIAL CIRCUITS (K2) **12 hours**

Half Adder - Full Adder - Parallel Binary Adder - Half Subtractor - Full Subtractor - Parallel Binary Subtractor, Encoder – Decoder – Multiplexers – Demultiplexers – Counters: Ring Counter – Programmable Counter.

UNIT- IV: REGISTERS AND I/O ORGANIZATION (K2) **12 hours**

Flip flops: RS- D - JK - T Flipflops, Shift Register: Shift Left Register – Shift Right Register, Introduction to Asynchronous Data Transfer - Strobe Control and Handshaking.

UNIT-V: MEMORY ORGANIZATION (K2) **12 hours**

Memory Hierarchy – Main Memory – Associative Memory - Cache Memory - Virtual Memory.

(Beyond the Curriculum: Interleaved Memory)

TEXT BOOKS

1.Puri V. (2010). Digital Electronics Circuits and Systems (3rd Edition). Tata McGraw Hill Publication Company, India.

2.Morris Mano M. (2012). Computer System Architecture (3rd Edition). Pearson Education Publication, India.

REFERENCE BOOKS

1. Morris Mano M (2006), Digital Design (4th Edition), Prentice Hall of India.
2. Ata Elahi (2017), Computer Systems, Digital Design, Fundamentals of Computer Architecture and Assembly Language, Springer.
3. NikrouzFaroughi(2014), Digital Logic Design and Computer Organization with Computer Architecture for Security, McGraw Hill Education, Canada

BLENDED LEARNING

UNIT V: MEMORY ORGANIZATION

Topics	Links
Memory Hierarchy	https://www.youtube.com/watch?v=YVObWiciVgw
Main Memory	https://www.youtube.com/watch?v=bkJx-URsnyc

Associative Memory	https://www.youtube.com/watch?v=zLDZCHrvjs4
Cache Memory	https://www.youtube.com/watch?v=U2iE3MwFYmA
Virtual Memory	https://www.youtube.com/watch?v=ujoJ7J_l9cY

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3			2		3	2	2	3	3
CO2	3	3	3	3	2	2	2	2		3		2	3	3
CO3	3	3	3	3	2	2		2		3		2	3	3
CO4	3	3	3	3	2			3		3		2	3	2
CO5	3	3	2	2		2		2		3	3	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency of Assessment
1.	End Semester Examination	Once in a semester
2.	CIA I	Once in a semester
3.	CIA II	Once in a semester
4.	Model	Once in a semester
5.	Assignment (Unit I & II)	Twice in a semester
6.	Seminar (Unit III & IV)	Twice in a Semester
7.	Quiz (UNIT V)	Once in a semester

Course Designed by: Ms.M.Muthumalathi	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

SEMESTER: II

COURSE CODE: 23UCA2C03/23UCS2C03/23UIT2C03

TITLE OF THE COURSE: CORE - PYTHON PROGRAMMING

(Employability, Skill Development)

COURSE OBJECTIVES:

- To inculcate a greater understanding of programming language design and implementation.
- To comprehend the paradigm of object-oriented concepts with PYTHON Programming.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Discuss the fundamentals of programming with PYTHON.	**K2**
CO2	Illustrate problem solving techniques with Control Structures, Lists and functions	**K2**
CO3	Implement programs for real time problems using Modular Designs and OOPs	**K3**
CO4	Demonstrate the fundamentals of the text files, dictionary and sets	**K3**
CO5	Implement programs for GUIs and Graphics using Turtle and Tkinter	**K3**

Syllabus

Total Credits - 4 **Instructional Hours - 60**

UNIT I: Programming Concepts (K2) **12 hours**

The Python Programming Language: Python - The IDLE Python Development Environment - The Python Standard Library- Python IDLE-Data and Expressions: Literals- Numeric Literals - String Literals - Control Characters - String Formatting Implicit and Explicit Line Joining -Variables and Identifiers: Variable- Variable Assignment and Keyboard Input- Identifier- Keywords and Other Predefined Identifiers in Python Operators – Operator - Arithmetic Operators - Expressions and Data Types: Expression-Operator Precedence - Operator Associativity -Data Type - Mixed-Type Expressions.

UNIT II: Control structures and Functions (K2) **12 hours**

Control Structure - Iterative Control - While Statement - Input Error Checking -Infinite loops - Boolean Flags and Indefinite Loops - Lists: List Structures- Lists (Sequences) in Python: Python List Type – Tuples -Sequences -Nested Lists- Functions: Program

Routines - Defining Functions – Functions - Calling Value-Returning Functions - Calling Non-Value-Returning Functions - Parameter Passing - Keyword Arguments in Python - Default Arguments in Python - Variable Scope

(Self Study: Boolean Expressions – Selection Control)

UNIT III : Modular Design (K3) 12 hours

Modules - Module Specification - Python Modules- Modules and Namespaces- Importing Modules - Object-Oriented Programming: Class - Features of Object-Oriented Programming - Encapsulation - Defining Classes in Python - Inheritance Subtypes - Subclasses in Python - Polymorphism – Recursion: Recursive Functions.

(Beyond the Curriculum: Django web framework in python :The Local Library website-creating a skeleton website using models)

UNIT IV : Text Files and Dictionary & Sets (K3) 12 hours

Text Files: Text File - Text Files Uses- Opening Text Files - Reading Text Files - Writing Text Files - String Processing - String Traversal - Sequence Operations - String Methods - Exception Handling - The Propagation of Raised Exceptions - Catching and Handling Exceptions - Exception Handling and User Input - Exception Handling and File Processing - Dictionaries and Sets: Dictionary Type in Python- Dictionary- Set Data Type in Python Modular Design

UNIT V: Turtle and Tkinter (K3) (Industry 4.0) **12 hours**

Objects and Their Use: Software Objects - Object - Object References - Turtle Graphics - Creating a Turtle Graphics Window - The "Default" Turtle -Fundamental Turtle Attributes and Behavior - Additional Turtle Attributes - Creating Multiple Turtles - GUI Programming : Tkinter – Introduction – Tkinter and Python Programming – GUIs-Related Modules and GUIs.

TEXT BOOKS

1. Charles Dierbach, Introduction To Computer Science Using Python –Computational Problem-Solving Focus,Reprint (2016), Wiley Publication,,India.

2. Wesley J Chun, Sunnyvale, California(2012),Core Python Applications Programming (3rd Edition), Pearson Publications,United Kingdom.

REFERENCE BOOKS

1. ReemaThareja(2019), Python Programming Using Problem Solving Approach (1st Edition), Oxford University, London.
2. Kenneth A. Lambert (2014), Martin Osborne, Fundamentals of Python (1st Edition), Cengage Publication, United Kingdom.
3. Rob Miles(2017), Begin to Code with Python (1st Edition), Pearson Education, United Kingdom.

BLENDED LEARNING

UNIT V: Turtle and Tkinter

Topic	Link
Software Objects	https://www.youtube.com/watch?v=_uYorV9ebLg
Object and Object References	https://www.youtube.com/watch?v=zedS1tR5OCU
Turtle Graphics	https://www.youtube.com/watch?v=ptEVisUCniw
Turtle Graphics Window	https://www.coursera.org/lecture/python-basics/our-first-turtle-program-TOxha
Turtle Attributes and Behavior	https://cleverprogrammer.teachable.com/courses/learn-python/lectures/1539085
Multiple Turtle	https://www.coursera.org/lecture/python-basics/instances-a-herd-of-turtles-hUkpB
Tkinter and Python Programming and GUIs	https://www.youtube.com/watch?v=D8-snVfekto

MAPPING OF COs WITH Pos AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3		2	2			3		3	3	
CO2	3	3	3	3	3	2	3		2	3		3	3	
CO3	3	3	3	3	3	2	3		2	3		3	3	3
CO4	3	3	2	3		2	3	2		2		2		
CO5	3	3	2	3	2	2	3	3		3	3	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency of Assessment
1.	End Semester Examination	Once in a semester
2.	CIA I	Once in a semester
3.	CIA II	Once in a semester
4.	Model	Once in a semester
5.	Assignment (Unit I & II)	Twice in a semester
6.	Seminar (Unit III & IV)	Twice in a semester
7.	Group Discussion (Unit V)	Once in a semester

Course Designed by: Dr.S. BeulaPrincy	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

Dr.S.THAVAMANI Dr.D.SHANMUGA PRIYAA Dr.K.JULIANA GNANASELVI Dr.T.DEEPA Mr.K. BOOPATHIKUMAR

SEMESTER: II

COURSE CODE: 23UCA2CP2

TITLE OF THE COURSE: CORE PRACTICAL - PYTHON PROGRAMMING

(Employability,Skill Development)

COURSE OBJECTIVES:

- To gain programming skills in python**.**
- To inculcate knowledge about the Object-Oriented concepts and file operations.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Apply math functions, control statements and demonstrate the use of stack overflow, Inheritance and recursive functions	**K3**
CO2	Implement the loop methodology, update elements using key values and apply the concepts for Graphical User Interface using Turtle and Tkinter	**K3**
CO3	Record: Implement programs and present result	**K3**

Total Credits-2 **Instructional Hours - 45**

LIST OF PROGRAMS

1) Implement Python program to calculate GCD of two numbers.
2) Write a program that accepts a list from user and reverse the content of list and display it without using built-in function.
3) Write a Python program to findv the index of an item of a tuple.
4) Write a Python function that checks whether a passed string is palindrome or not.

5) Implement function overloading with different function signatures.
6) Write a Python class named Circle constructed by a radius and two methods which will compute the area and the perimeter of a circle.
7) Write a Python program to get the factorial of a non-negative integer using recursive function.
8) Implement Python program to Calculate the most frequent words in a text read from a file.
9) Write a program to implement a multiple inheritance in python
10) Write a program to implement an Exception handling in python.
11) Write a program in python to add, delete, update an key value in dictionary and merge two Dictionary .
12) Write a Python program to count number of vowels using sets in given string
13) Write a Python GUI program to create a label and change the label font style (font name, bold, size) using tkinter module.
14) Write a python program to draw Colourful Star Pattern in Turtle.

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	2	2	2	2			2	3	2		
CO2	3	3	3				2	2	3		2	3	3	2
CO3	3	3	3	2				2	3		2	3	3	2

(Correlation**:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by: Dr. S. Beula Princy	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC:Ms. A. Jansi Rani	**Approved by:** **Principal**

SEMESTER: III

COURSE CODE: 23UCA3C04

TITLE OF THE COURSE: CORE: DATA STRUCTURES AND ALGORITHMS

(Skill Development)

COURSE OBJECTIVES:

- To recognize the problem, properties to develop an algorithm and determine the use of appropriate storage mechanisms of data in computer programs.
- To emphasize the knowledge of data structures and its fundamental operations in different real world applications.
- To apprehend the use of file organization methods to improve file access efficiency.

COURSE OUTCOMES:

At the end of the course the students will be able to:

CO1	Identify the different mechanisms to design algorithms in programming context.	**K1**
CO2	Implement the various operations of linear data structures.	**K3**
CO3	Construct non linear data structures to solve problems.	**K3**
CO4	Distinguish various file organizations for storing and retrieving data.	**K2**
CO5	Apply accessing and arranging techniques in various real time applications.	**K3**

Syllabus

Total Credits: 4 **Instructional Hours: 60**

UNIT-I: INTRODUCTION TO DATA STRUCTURES (K1) **(12 hours)**

History of Algorithms - Definition, Structure and Properties of Algorithms - Development of an Algorithm - Data Structures and Algorithms - Data Structure Definition and Classification - Efficiency of Algorithms - Apriori Analysis - Time Complexity of an Algorithm Using O Notations - Average, Best and Worst Case Complexities

UNIT-II: SEQUENTIAL DATA STRUCTURES (K3) (12 hours)

Introduction to Arrays – Array Operations - Number of elements in an Array - Representation of Arrays in Memory – Applications of Arrays - Introduction to Stack- Stack Operations – Applications of Stack – Introduction to Queues – Operations on Queues – Circular Queues - Other types of Queues- Applications of Queues.

(***Self Study: Applications of Stack***)

UNIT-III: LINKED LIST AND FILE ORGANIZATION (K3) (12 hours)

Introduction to Linked Lists - Singly Linked List – Circularly Linked List - Doubly Linked List - Linked Stacks and Queues – Introduction to File Organization – Files – Keys – File Operations – Heap or Pile Organization – Sequential File Organization – Indexed Sequential File Organization – Direct File Organization

(Beyond the Curriculum: Inverted List in File, Multi List File Organization, Cellular Partitions)

UNIT-IV: NON-LINEAR DATA STRUCTURES (K2) (12 hours)

Tree definition and basic terminologies - Representation of Trees – Binary Trees terminologies and types - Representation of Binary Trees - Binary Tree Traversals- Binary Search Trees and AVL Trees – Graph definitions and basic terminologies - Representation of Graphs – Graph Traversals

UNIT-V: ACCESSING AND ARRANGING (K3) (12 hours)

Searching techniques: Linear Search – Transpose Sequential Search - Binary Search – Sorting techniques - Bubble Sort - Insertion sort - Merge Sort - Quick Sort – Heap Sort. External Sorting-External Storage Devices-Sorting with tapes-Sorting with Disks- Polyphase – Cascade Merge sort.

TEXT BOOK:

1. Vijayalakshmi Pai. G.A., *Data Structures and Algorithms-Concepts, Techniques and Applications* (1st Edition), McGraw Hill Education India Pvt. Ltd. (2016)

REFERENCE BOOKS:

1. Ellis Horowitz, Sahni Sartaj, Dinesh Mehta, *Fundamentals of Data Structures in C++* (2nd Edition), Orient Black Swan. (2007)
2. Seymour Lipschutz, *Data Structures*, Schaum's Outline Series (1st Edition), Tata Mc Graw Hill Publishing Company Ltd, India. (2010)
3. Jean-Paul Temblay, Paul G. Sorenson, *An Introduction to Data Structures with Applications* (2nd Edition), McGraw Hill Computer Science Series, India. (2001)

BLENDED LEARNING

UNIT V: ACCESSING AND ARRANGING	
Topic	**Links**
Searching and Sorting Techniques	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/lecture-videos/lecture-12-searching-and-sorting/
Linear Search	https://www.youtube.com/watch?v=C46QfTjVCNU&feature=youtu.be
Binary Search	https://www.ideserve.co.in/learn/binary-search-in-a-sorted-array
Bubble Sort	https://www.youtube.com/watch?v=N35fv1YA_24
Merge Sort	https://www.coursera.org/lecture/algorithms-part1/mergesort-ARWDq
Quick Sort	https://www.coursera.org/lecture/algorithms-part1/quicksort vjvnC?authMode=signup&redirectTo=%2Flecture%2Falgorithms-part1%2Fquicksort-vjvnC
Heap Sort	https://www.youtube.com/watch?v=B7hVxCmfPtM

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		3		2	2	3	2	3	2	3	2
CO2	3	2	2	2	2	2	3	2	3	2	3	2	3	2
CO3	3	2	2	2	2	2	3	2	3	2	3	2	3	3
CO4	2	3	2		2				3		3	2	3	3
CO5	2	3	2	3	3	3	3	3	3	2	3	2	3	3

(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model	Once in a Semester
4	Assignment (Unit I & II)	Twice in a Semester
5	Seminar (Unit III & IV)	Twice in a Semester
6	Online Quiz (Unit V)	Once in a Semester

Course Designed by: Mrs. M. Judith Acquline	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor,	**Dr.D.Shanmuga Priyaa**	**Dr.K.Juliana Gnanaselvi**	**Dr.T.Deepa Associate Professor,**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist,**

Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**KPR College of Arts and Science, Coimbatore.**	**CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: III

COURSE CODE 23UCA3C05/ 23UCS3C05

TITLE OF THE COURSE: CORE: JAVA PROGRAMMING

(Employability)

COURSE OBJECTIVES:

- To impart the fundamental concepts of JAVA.
- To gain knowledge of standalone and web applications
- To understand the concepts for database connectivity.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Discuss the fundamentals of Java with illustration.	**K2**
CO2	Implement program using Inheritance and Packages concept.	**K3**
CO3	Summarize Exception handling and concurrent programming.	**K2**
CO4	Implement GUI programs for user-friendly environment.	**K3**
CO5	Illustrate File and back end connectivity.	**K2**

SYLLABUS

Credits: 4 **Instructional Hours : 60**

UNIT-I: INTRODUCTION (K2) (12 hours)

Java Features – Byte Code – Lexical issues - Class Fundamentals – Objects – Overloading Methods – Passing and Returning Objects – Recursion – Controlling Access to Members – this Keyword - static and final Keyword.

(Self Study: Recursion)

UNIT-II: INHERITANCE AND PACKAGES (K3) (12 hours)

Nested Classes – Inheritance – super Keyword – Multilevel Hierarchy – Method Overriding - Dynamic Method Dispatch – Object Class – Abstract Classes - Packages – Access Modifiers – Importing Packages – Interfaces – Applying Interfaces.

UNIT-III: EXCEPTION HANDLING AND THREADS (K2) (12 hours)

Exception Handling – Using Try Catch – Nested Try- Throw – Throws – Finally – Built In Exceptions – User Defined Exceptions - Threads – Thread Model – Creating Thread – Thread Priorities – Synchronization – Multithreading – Suspending - Resuming - Stopping Threads.

UNITIV: GUI PROGRAMMING WITH SWING(K3) (12 hours)

Introduction to Swing: Swing Features – MVC Connection – Components and Containers – Swing Packages – Swing Application. Exploring Swing – Swing Menus: Menu Basics – JmenuBar – Jmenu – JmenuItem – Main Menu – Adding Images and Tooltips to Menu Items – Popup Menu – Toolbar.

(Beyond the Curriculum: JSP architecture, Life Cycle of JSP, JSP Tags and Expressions)

UNITV: FILES AND DATABASES (K2) **(12 hours)**

Streams - Stream Classes - Byte Stream Classes - Character Stream Classes - Using Streams - I/O Classes - File Class - I/O Exceptions - Creation of Files - Reading/Writing Characters and Bytes - Primitive Data Types - Random Access File - JDBC Basics - Components of JDBC- Executing DLL and DML Commands.

TEXT BOOKS:

1. Herbert Schildt, *JAVA - The Complete Reference* (9th Edition), Mc Graw Hill Publications, United Kingdom.(2014)
2. Balagurusamy E, Programming with JAVA (5th Edition), Mc Graw Hill Education, India.(2014)
3. Rashmi Kanta Das , *Core Java for Beginners* (3rd Edition), First Reprint, Vikas publishing House Pvt Ltd, India.(2015)

REFERENCE BOOKS:

1. Paul Deitel, Harvey Deitel, *Java How to Program* (9th edition), Pearson Publications, United Kingdom. (2015)
2. Samanta D (2005), *Object Oriented Programming with C++ and JAVA* (2nd edition), Prentice-Hall of India Private Limited, India.
3. Bruce Eckel, Chuck Allison,*Thinking in Java* (3rd Edition), Prentice-Hall of India Private Limited, India. (2002)

BLENDED LEARNING

UNIT V: FILES AND DATABASES	
Topics	**Links**
Streams, Stream Classes,Byte Stream Classes	https://www.youtube.com/watch?v=SjMibFjAjr0
Character Stream Classes,Using Streams, I/O Classes,File Class	https://www.youtube.com/watch?v=NvRswBF-Yiw
I/O Exceptions	https://youtu.be/6LIoSR5N3t0

Creation of Files, Reading / Writing Characters and Bytes	https://www.youtube.com/watch?v=mkqbbkBqOaU
Primitive Data Types	https://youtu.be/Rilk5TayNbI
Random Access File	https://www.youtube.com/watch?v=XW0N07JbiCk
JDBC Basics - Components of JDBC	https://www.youtube.com/watch?v=kLz2h0vA1MI
Executing DLL and DML Commands	https://www.linkedin.com/learning/oracle-database-12c-basic-sql/introduction-to-dml-and-ddl-commands

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3		2	2	2	3		2		2		2	2	3
CO2	3	3	3	2	2	3	2	3		2		2	2	3
CO3	3	3	3	2	2	3		3		2		3	2	3
CO4	3	3	3	2	2	3	2	3		3	3	3	3	3
CO5	3	3	3	2	2	3		3		2	3	3	3	3

(Correlation: 3-High, 2-Medium, 1-Low**)**

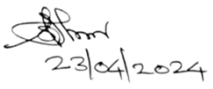
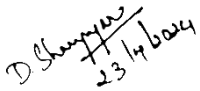
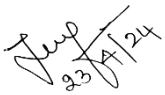
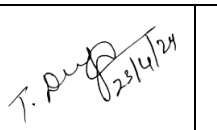
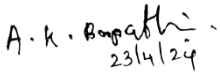
ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model	Once in a Semester
5	Assignment (Unit I & II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Quiz (Unit V)	Once in a Semester

Course Designed by:Dr.K.Gayathri	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:**

	Principal

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: III

COURSE CODE :23UCA3CP3

CORE PRACTICAL: JAVA AND DATA STRUCTURES

(Employability, Skill Development)

COURSE OBJECTIVES:

- To inculcate the knowledge on Java Programming.
- To develop skills to apply the knowledge of basic data structures.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Apply the basic concepts of Java and OOP.	**K3**
CO2	Apply the operations of data structures.	**K3**
CO3	Record: Implement Program and present result	**K3**

Credits: 2 **Instructional Hours: 60**

LIST OF PRACTICALS

JAVA

1. Write a program using decision making statements. Get the input through the keyboard.
2. Write a program to calculate students marks using method overloading.
3. Write a program to calculate electricity bill using inheritance.
4. Write a program to find the area of triangle and rectangle using package.
5. Write a program to handle divide by zero exception.
6. Write a program to implement threads.
7. Write a program that simulates a traffic light using swing components.
8. Write a java program to create a simple calculator using AWT.
9. Write a program to read and write file in java
10. Write a program using JDBC.

DATA STRUCTURES

1. Write a program to implement the operation of Stack.
2. Write a program to implement the operation of Queue.
3. Write a program to implement linked list operations.

4. Write a program to implement insertion sort.

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	3	2	2	2	2		2	2	3
CO2	3	3	3	2	2	3	2	3		2	2	2	2	3
CO3	3	3	3	2	2	3		3	2	2		3	2	3
CO4	3	3	3	2	2	3	2	3		3	3	3	3	3
CO5	3	3	3	2	2	3		3		2	3	3	3	3

(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by: Dr.K.Gayathri	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

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Coimbatore –641006.	**Coimbatore-641042.**	**Coimbatore-641021.**		

SEMESTER: III

COURSE CODE: 24UCA3SB1

TITLE OF THE COURSE: SKILL BASED: VISUAL DESIGN

(Employability, Entrepreneurship, Skill Development)

COURSE OBJECTIVES:

- To design webpages and websites using Figma.
- To Understand the basic concepts of editing tools using Photoshop.
- To inculcate the video editing concepts using Adobe Express.
- To create a video presentation using Canva.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Apply the basic designing concepts using Figma, Photoshop, Video editing and Canva.	**K3**
CO2	Implement the image editing techniques and animations	**K3**
CO3	Record: Implement Program and present Result	**K3**

Credits : 2 **Instructional Hours: 45**

LIST OF PRACTICALS

Figma

1. Design a simple login and registration page for an educational institution App.
2. Create and design a webpage with Login, Home, and Blog screens for any programming language concept.
3. Design an E-commerce website screen with Product, and Check out screens for seamless online shopping.

Photoshop

4. Design a basic image editing in Photoshop.
5. Create your own style simple resume using templates (proper layer manipulation) in Photoshop.
6. Design a social media graphic using templates and customizing with images and text (proper layer manipulation) in Photoshop.

Video Editing (Adobe Express)

7. Edit a vlog-style video of your daily routine using Adobe Express, adding transitions between clips.
8. Design a highlight reel of a recent event or celebration using Adobe Express.

Canva

9. Design a short informational video about yourself, utilizing Canva's text and animation tools.
10. Design a video presentation for interview tips using Canva's templates and customization options.

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
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CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

(**Correlation:** 3-High, 2 – Medium, 1 – low)

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Observation Note	Once in a Semester
5	Record Note	Once in a Semester

Course designed by: Dr.K.Gayathri	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by :** **Principal**

MEMBERS OF BOARD OF STUDIES:

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SEMESTER: IV

COURSE CODE: 23UCA4C06

TITLE OF THE COURSE: CORE: MODERN OPERATING SYSTEMS

COURSE OBJECTIVES:

- To understand the essentials of Operating Systems.
- To know the components and management aspects of processor, deadlock and memory.

COURSE OUTCOMES:
At the end of the course the students will be able to:

CO1	Describe the necessary components in operating systems with examples	**K1**
CO2	Illustrate the process management strategies.	**K2**
CO3	Express the various deadlocks algorithms.	**K2**
CO4	Discuss the mechanisms involved in memory management.	**K2**
CO5	Discussion of case study on different Operating Systems.	**K2**

Syllabus

Total Credits: 4 **Instructional Hours: 60**

UNIT-I: INTRODUCTION TO OPERATING SYSTEMS (K1) (12 hours)

History - Operating System Environments - Operating System Components and Goals - operating System Architectures - Hardware Components – Software Overview.

UNIT-II: PROCESS MANAGEMENT (K2) (**12 hours**)

Process - Process States - Process Management – Interrupts – Interprocess Communication – Thread States - Thread Operations - Threading Models – Semaphores - Scheduling Levels - Preemptive Vs Non - Preemptive Scheduling – Priorities - Scheduling Algorithms.

(***Self Study: Thread Operations, Threading Models***)

UNIT-III: DEADLOCK (K2) **(12 hours)**

Deadlock - Indefinite Postponement - Necessary Conditions for Deadlock – Deadlock Solutions- Deadlock Prevention - Deadlock Avoidance - Deadlock Detection – Deadlock Recovery- Deadlock Strategies in Current and Future Systems.

UNIT-IV: MEMORY MANAGEMENT (K2) **(12 hours)**

Memory Management Strategies - Contiguous Vs Non-Contiguous Memory Allocation - Single User Contiguous Memory Allocation - Fixed Partition Multiprogramming – Variable Partition Multiprogramming – Virtual Memory Basic Concepts –Paging :Paging Address Translation by Direct Mapping , Associative Mapping, Direct/Associative Mapping – Segmentation- Locality - Demand Paging - Page Replacement - Page Replacement Strategies.

(Beyond the Curriculum : Managing the free memory)

UNIT-V: CASE STUDY (K2) **(12 hours)**

Linux System — Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, Input-Output Management, File System, Inter-process Communication; Mobile OS — iOS and Android — Architecture and SDK Framework, Media Layer, Services Layer, Core OS Layer, File System.

TEXT BOOK:

1. Harvey M. Deitel, *Operating Systems* (3rd Edition), Pearson Education Publication, United Kingdom.(2013)

REFERENCE BOOKS:

1. Achyut.S Godbole, *Operating Syst*ems (2nd Edition), Tata McGraw Hill Publications, India. (2002)
2. Dhamdhere D.M, *System Programming and Operating System* (2nd Edition),Tata McGraw Hill Publications, India. (1999)
3. Pradeep K Sinha, *Distributed Operating System and Compiler Design* (2nd Edition), Prentice

Hall, India. (1998)

4. Andrew S Tanenbaum, *Modern operating System*(4th Edition), Pearson Education Publications,United Kingdom. (2014)
5. Abraham Silberschatz, Peter B.Galvin, Greg Gane, *Operating System Concepts* (9th Edition), Wiley Global Education. (2012)
6. Daniel P Bovet and Marco Cesati,*Understanding the Linux kernel*, 3rd edition, O'Reilly.

BLENDED LEARNING

UNIT V : CASE STUDY	
Topic	**Links**
Case Study of Linux	https://www.srividyaengg.ac.in/coursematerial/CSE/104455.pdf
iOS and Android	https://www.jeppiaarinstitute.org/pdf/lectures/605.pdf

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	3		2	3		2		3	3	3
CO2	3	3	3	3	3	3	3	3		2	3	3	3	3
CO3	3	3	3	3	3	3	3	3		2	3	3	3	3
CO4	3	2	3			2		2		3	2	3	2	3
CO5	3	2	3			2		2		3	2	3	2	3

(Correlation: 3 – High, 2 – Medium ,1 - Low**)**

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1.	End Semester Examination	Once in a semester
2.	CIA I	Once in a semester
3.	CIA II	Once in a semester
4.	Model	Once in a semester
5.	Assignment (Unit I & II)	Twice in a semester
6.	Seminar (Unit III & IV)	Twice in a semester
7.	Online Quiz (UNIT V)	Once in a semester

Course Designed by:Ms.S.Kulandai Teresa	Verified by HOD:Ms. E. Sylvia
Checked by CDC :Ms.A.Jansi Rani	Approved by: Principal

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: IV

COURSE CODE: 23UCA4C07

TITLE OF THE COURSE: CORE:PHP PROGRAMMING

(Employability, Entrepreneurship, Skill Development)

COURSE OBJECTIVES:

- To analyze the basic structure of PHP Web Applications
- To Understand the concepts of MYSQL

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Discuss the fundamentals of PHP programming with Identifiers Operators and Data Types	**K2**
CO2	Demonstrate the Controlling Program Flow	**K3**
CO3	Examine the PHP program using Arrays.	**K3**

CO4	Illustrate the concept of Functions and Classes, Working with Files and Directories	**K2**
CO5	Illustrate the Working principles of Database and SQL.	**K2**

SYLLABUS

Credits: 4 **Instructional Hours: 60**

UNIT-I: PHP BASICS (K2) **(12 hours)**

Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT-II: CONTROLLING PROGRAM FLOW(K3) **(12 hours)**

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT-III: ARRAYS (K3) **(12 hours)**

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

(***Self study:Working with Dates and Times***)

UNIT-IV: FUNCTIONS,CLASSES, FILES AND DIRECTORIES (K2) **(12 hours)**

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing Files Processing Directories.

(Beyond the Curriculum: Working with XML)

UNIT-V: DATABASE AND SQL (K2) **(12 hours)**

Working with Database and SQL: Introducing Database and SQL- Using MySQL Extension-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Working with Cookies, Sessions and using HTTP Headers.

TEXT BOOK:

1. PHP A Beginner‘s Guide - VIKRAM VASWANI, Tata McGraw-Hill

REFERENCE BOOKS:

1. The PHP Complete Reference – Steven Holzner – Tata McGraw-Hill Edition.
2. Spring into PHP5 – Steven Holzer, Tata McCraw Hill Edition

BLENDED LEARNING

UNIT V: DATABASE AND SQL	
Topic	**Links**
Introducing Database and SQL- Using MySQL Extension	https://www.youtube.com/watch?v=FR4QIeZaPeM
Adding and modifying Data	https://www.youtube.com/watch?v=8aEznmj40sc
Handling Errors	https://www.youtube.com/watch?v=a4u0YulEIX8
Using SQLite Extension and PDO Extension	https://www.youtube.com/watch?v=wcD5HlEHrnc
Working with Cookies, Sessions	https://www.youtube.com/watch?v=jort8_4U-88
HTTP Headers	https://www.youtube.com/watch?v=W7tj0Qlk3rE

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	3	2		3	2	2	3	3	2	3	3
CO2	3	3	3	3	3		3	2	2	2	3	2	2	3
CO3	2	2	2	2	3		3	2	2		2	2	3	2
CO4	3	3	3	3			3	3	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	2	3	3	3	3	3

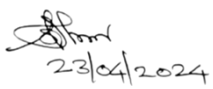
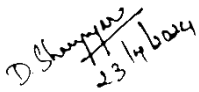
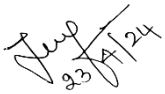
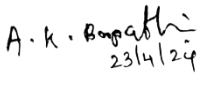
(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model	Once in a Semester
5	Assignment (Unit I &II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Hands on Training (Unit V)	Once in a Semester

Course Designed by:Ms. M.Muthumalathi	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: IV

COURSE CODE: 23UCA4CP4

TITLE OF THE COURSE: CORE PRACTICAL-PHP PROGRAMMING

(Employability, Entrepreneurship, Skill Development)

COURSE OBJECTIVES:

- To impart practical training in PHP Programming Language.
- To impart database connectivity with PHP Programming Language.

COURSE OUTCOMES

At the end of the Course the students will be able to:

CO1	Apply the basic Concepts of PHP, use of Functions and oops Concept.	**K3**
CO2	Create applications using decision-making using file Concepts.	**K3**
CO3	Record: Implement Program and present Result.	**K3**

Credits- 2 **Instructional hours - 60**

LIST OF PRACTICALS

1. Write a Program to print the number triangle.
2. Generating biodata using user input validation in PHP programming.
3. Write a program to check the eligibility of voting using conditional statement.

Functions

4. Write a program using functions in PHP and factorial of n numbers using recursion.

Class and objects

5. Write a program in PHP for student academic information using class and object.

PHP self

6. Write a program for online quiz using PHP self.

Database connectivity

7. Write a program to maintain employee details using input validation and database connectivity.

Cookies

8. Write a program to find the number of times the user has visited a particular web page.

Session

9. Maintain student information using session in PHP.

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	3	2	2	2	2	3		2	3	2	3	2

CO2	3	3	3	3	2		2	2	3		2	3	3	2
CO3	3	3	3	2	2	2	3	2	3	2	2	3	3	2

(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by : Mrs.M.Judith Acquline	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC : Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

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SEMESTER: IV

COURSE CODE: 23UCA4SB2

TITLE OF THE COURSE: SKILL BASED - OPERATING SYSTEMS LAB

(***Skill Development***)

COURSE OBJECTIVES:

- To provide necessary skills for developing and debugging programs in Linux environment.
- To inculcate the knowledge on programming using shell scripts

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Apply the basic LINUX commands and process concepts	**K3**
CO2	Apply the shell scripts to automate different tasks.	**K3**
CO3	Record: Implement Program and present result	**K3**

Credits: 2 **Instructional Hours: 45**

LIST OF PROGRAMS

1. Write Basic Commands for VI-Editor used in Linux.
2. Write a program to create child process and verify the child's parent ID and parentprocess ID.
3. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
4. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
5. Illustrate by writing script using for loop to print the following patterns?

i) *
* *
* * *
* * * *
* * * * *

ii) 1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

6. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
7. Illustrate to redirect the standard input (stdin) and the standard output (stdout) of a process, so that scanf () reads from the pipe and printf () writes into the pipe
8. Write an awk script to count the number of lines in a file that do not contain vowels.

MAPPING OF CO's WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	3	2	3	3	2	2	3	3	3	3
CO2	3	2	3	3	3	3	3	3	2		3	3	3	3
CO3	3	3	3	3	2	3	3	3		2	3	3	3	3

(Correlation: 3-High, 2 – Medium, 1 – Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by:Mrs.S.Kulandai Teresa	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor,	**Dr.D.Shanmuga Priyaa**	**Dr.K.Juliana Gnanaselvi**	**Dr.T.Deepa Associate Professor,**	**Mr.K. Boopathikumar**

Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**KPR College of Arts and Science, Coimbatore.**	**Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER : V

COURSE CODE: 23UCA5C08

TITLE OF THE COURSE:CORE :NETWORK COMMUNICATION AND SECURITY

(Employability, Skill Development)

COURSE OBJECTIVES:

- To understand the basic terminology of computer networks
- To analyze the protocols in networking and the layers in the protocol stack.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Discuss the foreword of networks with network hardware/software and the Architectural models.	**K2**
CO2	Express the functionalities of physical layer with wired and wireless transmission media.	**K2**
CO3	Interpret data link layer that transfers data to other layer using necessary techniques.	**K2**
CO4	Discuss the various routing paths of data transfer for delivering the data to the networked host computers through suitable transport/application layer protocols.	**K2**
CO5	Illustrate the application layer using web based features and Network Security.	**K2**

SYLLABUS

Credits : 5 **Instructional Hours : 75**

UNIT-I: CONCEPTUAL VIEW TO NETWORKS (K2) (15 hours)

Introduction to Network - Uses - Network Hardware - Network Software - The OSI Reference Model - The TCP/IP Reference Model - A Comparison of OSI and TCP/IP Reference Model.

UNIT-II: PHYSICAL LAYER (K2) (15 hours)

Guided Transmission Media - Communication Satellites - Structure of the Telephone System – Modems - Wireless Local Loops - Switching.

UNIT-III: DATA LINK LAYER (K2) (15 hours)

Data Link Design Issues - Error Detection and Correction - The Channel Allocation Problem - Carrier Sense Multiple Access Protocols - Collision-Free Protocols- Bluetooth Architecture - Bluetooth Applications – Repeaters - Hubs - Bridges - Switches - Routers - Gateways.

(Self study: Bluetooth Applications)

UNIT-IV: NETWORK AND TRANSPORT LAYER (K2) (15 hours)

Network Layer Design Issues - Shortest Path Routing - Distance Vector Routing - Routing for Mobile Hosts - The Transport Service - Transport Service Primitives -Berkeley Sockets - Elements of Transport Protocols.

(Beyond the Curriculum: Quality of Services)

UNIT-V: APPLICATION LAYER AND SECURITY (K2) (15 hours)

DNS – The Domain Name System - Electronic Mail: Architecture and Services –The User Agent. Network Security: Cryptography – DES- Communication Security- E-mail Security- Web Security.

TEXT BOOK:

1. Andrew S. Tanenbaum, *Computer Networks* (4th Edition), Pearson Education Publications, UK.(2006)

REFERENCE BOOKS:

1. Miller, *Data and Network Communications* (1st Edition), Vikas Publications, India. (2001)
2. William A Shay, *Understanding Data Communications and Networks*, (2nd Edition), Vikas Publications, India. (2001)
3. Kirubanand .V.B. & Suresh .S, *Computer Networks* (1st Edition), R.K.Publications. (2003)
4. Behrouz A forouzan, *Data communications and Networking* (4th Edition), Tata Mc Graw Hill Publications, India. (2006)

BLENDED LEARNING

UNIT V: APPLICATION LAYER AND SECURITY	
Topic	**Links**
The application layer: DNS	https://youtu.be/JkEYOt08-rU

ElectronicMail: Architecture and services, the user agent	https://youtu.be/Tlo5IKgfVnghttps://youtu.be/QqTWyl58Rvw https://youtu.be/L2NAQbZeRXo https://youtu.be/ff3YN8qoEQA
Cryptography	https://www.youtube.com/watch?v=C7vmouDOJYM
DES	https://www.youtube.com/watch?v=cVhlCzmb-v0
Communication Security	https://www.youtube.com/watch?v=mAef8iREIt8
E-Mail Security	https://www.youtube.com/watch?v=lcBpC1RsWsw
Web Security	https://www.youtube.com/watch?v=IL7OvI5ohtU

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2					3	2	3		3	2	3
CO2	3	3	2	2	2			2	3	3		3	3	3
CO3	3	2	3	2	2		3	2	3	3	3	3	3	3
CO4	3	3	3	3	2	2	2	3	2	3	3	3	2	3
CO5	3	3	2		2	3	2	2	3	3	2	3	3	3

(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
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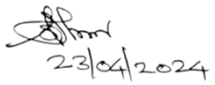
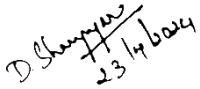
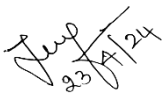
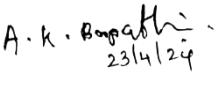
5	Assignment (Unit I & II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Case Study (Unit V)	Once in a Semester

Course Designed by: Dr. S. Beula Princy **Ms. M. Muthumalathi**	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC : Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES: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SEMESTER: V

COURSE CODE: 23UCA5C09/23UCS5C09

TITLE OF THE COURSE: CORE: RELATIONAL DATABASE MANAGEMENT SYSTEM

(Skill Development)

OBJECTIVES:

- To provide the domain concepts to design databases.
- To build effective database tables applying the PL/SQL procedure techniques.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Illustrate the basic concepts of designing database using procedure.	**K2**
CO2	Infer the overview of Oracle environment with the syntax to design tables in real time applications.	**K2**
CO3	Implement the working of tables using SQL queries on data.	**K3**
CO4	Interpret the fundamentals in PL/SQL with examples.	**K2**
CO5	Apply named blocks to modularize PL/SQL programs using cursors.	**K3**

SYLLABUS

Credits:5 **Instructional Hours : 75**

UNIT-I: INTRODUCTION TO DATABASE DESIGN CONCEPTS (K2) (15 hours)

Database – Relationship – DBMS - Relational data Model – Integrity Rules – Theoretical Relational Languages - Data Modeling and Normalization – Dependency - Normal Forms – Dependency Diagrams – Examples of Normalization - De–Normalization.

UNIT-II: Overview of Oracle with Data Definition Language (K2) (15 hours)

Personal Database – Client / Server Database - Oracle Introduction – SQL * Plus Environment – SQL – Logging into SQL *Plus – SQL *Plus Commands – Errors &Help – Alternate Text Editors - SQL *Plus Worksheet - iSQL Plus - Naming Rules and Conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

UNIT-III: DATA MANIPULATION LANGUAGE (K3) (15 hours)

Adding a new Row/Record – Customized Prompts – Updating and Deleting Existing Row/Record – Retrieving Data from Table – Arithmetic Operations – Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – Built in Functions – Grouping Data - Join - Set Operators.

(Beyond the Curriculum: Objects, Transactions and Data Control)

UNIT-IV: PROCEDURAL LANGUAGE EXTENSIONS TO SQL (K2) (15 hours)

History – Fundamentals – Block Structure – Comments – Data Types – Composite Data Types – Declaration – Assignment Operation – Bind Variables – Printing – Arithmetic Operators - Control Structures – Nested Blocks – SQL in PL/ SQL – Data Manipulation – Transaction Control Statements.

(Self Study:Control Structures)

UNIT-V: NAMED BLOCKS USING CURSORS (K3) (15 hours)

Cursors – Implicit & Explicit Cursors and Attributes – Cursors FOR Loops – SELECT … FOR UPDATE – WHERE CURRENT OF Clauses – Cursors with parameters – Cursors Variables – Exceptions – Types of Exceptions - Procedure – Functions – Packages – Triggers – Data Dictionary Views.

TEXT BOOK:

1. Nilesh Shah, *Database Systems Using Oracle* (2nd Edition), Prentice Hall,United States. (2004)

REFERENCE BOOKS:

1. Arun K. Majumdar, Pritimoy Bhattacharya, *Database Management Systems* (1st Edition), McGraw Hill Education,India.(2004)
2. Gerald V. Post, *Database Management Systems*(3rd Edition),Tata McGraw Hill Education.(2004)
3. Ivan Bayross, *SQL, PL/SQL The programming language of Oracle* (4th revised Edition), BPB Publications. (2009)
4. Deshpande P.S, *SQL/PLSQL for Oracle9i*, Reprint edition 2009, Dreamtech press. (2003)

BLENDED LEARNING

UNIT V: NAMED BLOCKS USING CURSORS	
Topic	**Link**
Fundamentals, Block Structure, Assignment Operation	https://www.youtube.com/playlist?list=PLL_LQvNX4xKyiExzq9GKwORoH6nvaRnOQ
Implicit & Explicit Cursors and Attributes Cursors SELECT Cursors Variables	https://www.youtube.com/playlist?list=PLdNnjIwbbBta4OtYXI-C0EceBrl8a5xas

MAPPING OF COs WITH PO's AND PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	3	2	2	2	2	2	2		2	2	3	3	3
CO2	3	3	3	3	2	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	2	3	2	3	3	3	3	3
CO4	3	3	3	2	2	3	2	2		2	2	2	3	3
CO5	3	3	3	2	2	3	2	3		2	2	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model	Once in a Semester
5	Assignment (Unit I & II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Case Study (Unit V)	Once in a Semester

Course Designed by:Ms. S. Kulandai Teresa	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC:Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: V

COURSE CODE: 23UCA5CP5/23UCS5CP5

TITLE OF THE COURSE: CORE PRACTICAL - RELATIONAL DATABASE MANAGEMENT SYSTEM

(Skill Development)

COURSE OBJECTIVES:

- To inculcate knowledge on DML and DDL Commands.
- To inculcate knowledge on Procedures, Functions and Trigger concepts.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Illustrate the basic concepts of Data Definition Language using Built in Functions and different operations in tables.	**K3**
CO2	Manipulate the data using control structures and named blocks in PL/SQL	**K3**

CO3	Record : Implement Program and present Result	**K3**

Credits: 3 **Instructional Hours: 75**

LIST OF PRACTICALS

1. Create an employee table and perform the following updation and alteration.
    a. Add a new column.
    b. Change the size of salary column
    c. Increase the salary of all employees by 20 %
    d. Change the Department for two employees.
    e. Remove one of the employee record
    f. Change the name of employee table.
2. Create an Item table and write queries for the following statements using built in Functions.
    a. Find the minimum and maximum of item price.
    b. Find the average price for two items and display the rounded value of average.
    c. Concatenate Item name and Quantity.
    d. Find the length of the department.
    e. Retrieve the Manufacture date in 'DD/Month/YY' format.
    f. Retrieve the Item name, manufacture date after adding 3 months to the date.
3. Create a Student Information table and perform the following operations.
    a. Comparison Operations
    b. Logical Operations
    c. Set Operations
    d. Sorting and Grouping
4. Create a Students Information table and write a PL/SQL Block. Find the Total, Average marks and Results.
5. Write a PL/SQL Block to split the Students Information table into two, one with the passed and other with failed.
6. Write a PL/SQL Block to join two tables, first table contains Roll Number, Name, Total and second table contains the Roll Number and Address.
7. Write a PL/SQL Block to implement Exception Handling.
8. Write a program to design an Electricity Bill using stored procedure concept.

9. Write a Recursive Function in PL/SQL to find the factorial of N numbers.
10. Write a Database Trigger to implement the Master-Detail Relationship.

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	2	2	3	2	3			2	3	3	3
CO2	3	3	3	2	3	3	2	3			2	3	3	3
CO3	3	3	3	2	3	3	2	3			2	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by:Ms. S. Kulandai Teresa	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

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SEMESTER: V

COURSE CODE: 23UCA5E01

TITLE OF THE COURSE: ELECTIVE: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

(INDUSTRY 4.0)

COURSE OBJECTIVES:

- To introduce to the basic concepts of Artificial Intelligence.

- To Study the characteristics of AI for solving real-world problems.
- To choose the appropriate algorithm for an AI problem.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Explain various AI search algorithms.	**K2**
CO2	Describe the fundamentals of knowledge representation.	**K2**
CO3	Analyze search methods appropriate to AI problems.	**K4**
CO4	Interpret various forms of learning.	**K3**
CO5	Construct the working knowledge in PROLOG.	**K3**

SYLLABUS

Credits - 4 **Instructional Hours - 75**

UNIT I: INTRODUCTION (K2) **(15 hours)**

AI Foundations - History - The Nature of Environments - Structure of Agents - Problem Solving - Problem Solving Agents - Example Problems - Searching for Solutions.

UNIT II: SEARCHING TECHNIQUE (K2) **(15 hours)**

Depth First/Breadth First Search - Heuristic Search: Hill Climbing - Constraint Satisfaction - Mean End Analysis - Best First Search - A* Algorithm - AO* Algorithm.

UNIT III: LOGIC (K4) **(15 hours)**

The Role of Logic – Tautologies - Contradictions and Contingencies - Computer Program for Identifying Whether the Given Proposition is a Tautology - Predicate Logic or First Order Logic - Free and Bound Variables - Normal Forms in Predicate Logic - Methodology for Converting Predicate Logic Formulae into Prenex Normal Form - Herbrand's Theorem and Resolution.

UNIT IV: LEARNING (K3) **(15 hours)**

Learning From Observations - Forms of Learning - Inductive Learning - Learning Decision Trees - Ensemble Learning - Knowledge in Learning - Logical Formulation of Learning - Explanation Based Learning - Learning Using Relevant Information - Inductive Logic Programming - Statistical Learning Methods - Reinforcement Learning.

UNIT V: EXPERT SYSTEMS AND PROLOG (K3) (15 hours)

Logic Programming and Prolog - Preliminaries of PROLOG - Milestones in PROLOG Language Development - Horn Clause - Robinson's Resolution Rule - Parts of a PROLOG Program - Queries to a Database - Query Solving - Compound Queries - Introduction to Expert Systems - Definition of Expert Systems - Characteristics of an Expert System - Architecture and Description of Modules - Knowledge Engineering - Experts System Life Cycle- Expert System tools.

TEXT BOOKS:

1. Stuart Russell and Peter Norvig, *Artificial Intelligence, A Modern Approach* (3rd Edition),Pearson Edition Limited, United Kingdom. (2016)
2. Janakiraman V.S, Sarukesi K and GopalaKrishnan P, *Foundations of Artificial Intelligence and Expert Systems*, Macmillan Publishers, India.(2007)

REFERENCE BOOKS:

1. Russell, S. J. and Norvig, P., *Artificial intelligence: A modern approach*, Upper Saddle River (3rd Edition), NJ: Prentice-Hall, USA. (2010)
2. N.P. Padhy,*Artifical Intelligence and Intelligence Systems* (Illustrated Edition), Oxford UniversityPress, UK. (2005)
3. David Carmona,*The AI Organization* (1st Edition),O'Reilly Media, USA.(2019)

BLENDED LEARNING

UNIT V: EXPERT SYSTEMS AND PROLOG	
Topic	**Links**
Logic Programming and Prolog	https://www.youtube.com/watch?v=jySpg72Vbc4
Preliminaries of PROLOG	https://www.youtube.com/watch?v=pcrZpyu3Snw
Horn Clause	https://www.youtube.com/watch?v=jr0gRcAyOxk
Robinson's Resolution Rule	https://www.engineeringenotes.com/artificial-intelligence-2/robinsons-inference-rule-artificial intelligence/34988#:~:text=Thus%20by%20Robinson's%20rule%2C%20both,Loves%20(joh n%2C%20mary)
Parts of a PROLOG Program, Queries to a Database, Query Solving, Compound Queries	https://www.youtube.com/watch?v=h9jLWM2lF0

Introduction to Expert Systems, Definition of Expert Systems	https://www.youtube.com/watch?v=11nzrNkn9D8
Architecture and Description of Modules	https://www.youtube.com/watch?v=xyqoehKyVhY
Knowledge Engineering	https://www.youtube.com/watch?v=vRlcD4zsts&list=PLUrGA3bee6mH0gcgX1do6Q1WjpE5JMlC6&index=10
Experts System Life Cycle	https://www.youtube.com/watch?v=txZ294S9JLQ
Expert System tools	https://www.engineeringenotes.com/artificial-intelligence-2/expert-systems/construction-of-an-expert-system-4-tools-artificial-intelligence/35582

MAPPING OF COS WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	3	2		3	3	3	3	3	3
CO2	3	3	3	3	3	3	2	2	3	3	2	3	3	2
CO3	3	3	3	2	3	3	2	2	3	3	2	3	3	2
CO4	3	3	3	2	3	3	3		3	3	3	3	3	3
CO5	3	3	3	2	3	3	3		2	3	2	3	3	2

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
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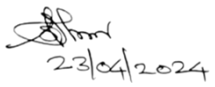
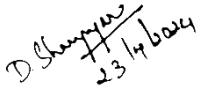
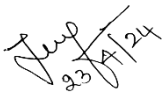
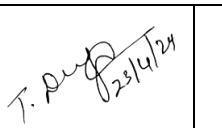
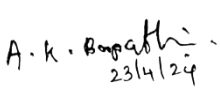
7	Group Discussion (Unit V)	Once in a Semester

Course designed by: Dr.S. BeulaPrincy **Ms.S. Kulandai Teresa** **Ms. M. Muthumalathi**	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by :** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani **Associate Professor,** **Department of Computer Applications,** **Sri Ramakrishna College of Arts & Science (Autonomous).** **Coimbatore –641006.**	**Dr.D.Shanmuga Priyaa** **Assistant Professor,** **Department of Computer Science,** **Sri Krishna Adithya College of Arts and Science,** **Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi** **Head, Department of Information Technology,** **Rathinam College of Arts and science** **Coimbatore-641021.**	**Dr.T.Deepa** **Associate Professor,** **KPR College of Arts and Science,** **Coimbatore.**	**Mr.K. Boopathikumar** **Trainer/Full Stack Developer/Data Scientist,** **CEO, Training Trains,** **New Siddhapudur,** **Coimbatore – 641 044.**

SEMESTER: V

COURSE CODE: 23UCA5E02

TITLE OF THE COURSE: ELECTIVE : DATA SCIENCE

(Employability)

COURSE OBJECTIVE:

- To develop fundamental knowledge of concepts underlying data science and give a hands-on experience with real-world data analysis.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Know basic notions and definitions in data analysis, machine learning.	**K2**
CO2	Know standard methods of data analysis and information retrieval.	**K2**
CO3	Be able to formulate the problem of knowledge extraction as combinations of data filtration, analysis and exploration methods.	**K2**
CO4	Illustrates the challenges that Big Data Using Engine Techniques	**K2**
CO5	Illustrates the Principal Component Level and Create Own Ideas	**K2**

Syllabus

Credits :4 **Instructional Hours : 75**

UNIT-I: INTRODUCTION TO DATA SCIENCE (K2) (15 hours)

Data Science -Data and Data Science hype – and getting past the hype - Datafication - Current landscape of perspectives - Skill sets needed, Statistical Inference - Populations and samples - Statistical modeling, probability distributions, fitting a model - Introduction to R.

UNIT-II: DATA ANALYSIS AND BASIC TOOLS (K2) (15 hours)

Exploratory Data Analysis (EDA) and the Data Science Process - Basic tools (plots, graphs and summary statistics) of EDA - Philosophy of EDA - The Data Science Process- Case Study: Real Direct (online real estate firm), Three Basic Machine Learning Algorithms -

Linear Regression - k-Nearest Neighbors (k-NN) - k-means - Feature Generation and Feature Selection (Extracting Meaning From Data).

UNIT-III: FEATURE EXTRACTION (K2) (15 hours)

User (customer) retention - Feature Generation (brainstorming, role of domain expertise, and place for imagination) - Feature Selection algorithms – Filters; Wrappers; Decision Trees; Random Forests.

UNIT-IV: RECOMMENDATION SYSTEMS (K2) (15 hours)

Building a User-Facing Data Product - Algorithmic ingredients of a Recommendation Engine.

UNIT-V: DIMENSIONALITY REDUCTION (K2) (15 hours)

Singular Value Decomposition - Principal Component Analysis - Exercise: build your own recommendation system

TEXT BOOK:

1. Cathy O'Neil and Rachel Schutt. *Doing Data Science, Straight Talk from the Frontline.* O'Reilly Edition, (2014).

EFERENCE BOOKS:

1. Jure Leskovek, Anand Rajaraman and Jerey Ullman. *Mining of Massive Datasets*, Cambridge University Press. (2014). (free online)
2. Kevin P. Murphy. *Machine Learning: A Probabilistic Perspective*. (2013).
3. Foster Provost and Tom Fawcett,*Data Science for Business: What You Need to Know about.*
4. Data Mining and Data-analytic Thinking. ISBN 1449361323. (2013)

BLENDED LEARNING

UNIT V: SINGULAR VALUE DECOMPOSITION	
Topic	**Link**
Singular Value Decomposition	https://www.youtube.com/watch?v=gXbThCXjZFM,
Principal Component Analysis	https://youtu.be/g-Hb26agBFg
Build your own recommendation system	https://www.youtube.com/watch?v=MVB1cbe923A

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	3	2	2		2	2		3	3	3
CO2	3	3	3				2	2	3		2	3	3	2
CO3	3	3	3	2	3			2	3		2	3	2	2
CO4	3	3	3	2	3	2			3	3	3	3	2	3
CO5	3	3	3	2	3	2			2		2	3	3	2

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
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7	Group Discussion(Unit V)	Once in a Semester

Course Designed by: Ms.M. Judith Acquline	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by :** **Principal**

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Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Coimbatore-641021.**		

SEMESTER: V

COURSE CODE: 23NCA5E01

TITLE OF THE COURSE: NON-MAJOR ELECTIVE - MOBILE COMPUTING

COURSE OBJECTIVES:

- To understand the basics of communication technologies
- To understand the concepts protocols and databases of mobile communications.
- To provide the knowledge on mobile operating system platforms.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Express the essentials of communication technologies.	**K2**
CO2	Interpret about the protocols and the transport of Mobile data.	**K2**
CO3	Discuss the storage of Mobile Environment.	**K2**
CO4	Summarize the routing protocols in Ad Hoc Networks.	**K2**
CO5	Discuss the Operating systems in mobile system security.	**K2**

SYLLABUS

Credits:4 **Instructional hours: 60**

UNIT-I: BASICS OF COMMUNICATION TECHNOLOGIES (K2) (12 hours)

Mobile Handsets, Wireless Communication and Server Applications – Cell Phone System- Types of Telecommunication Networks – Computer Networks – LAN

Architectures- Components of Wireless Communication System- Architecture of a Mobile Telecommunication System- Wireless Local Area Networks – Bluetooth Technology - Mobile Computing – Mobile Computing Vs Wireless Networking – Mobile Computing Applications –Characteristics – Structure – Global System for Mobile Communication – General Packet Radio Service.

UNIT-II: MAC AND MOBILE PROTOCOLS (K2) (12 hours)

Wireless MAC Issues – Fixed Assignment Schemes – Random Assignment Schemes – Reservation Based Schemes – Mobile IP – Packet Delivery - Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization- Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

UNIT-III: MOBILE DATABASES (K2) (12 hours)

Issues in Transaction Processing – Transaction Processing Environment – Data Dissemination – Transaction Processing in Mobile Environment - Data Replication – Mobile Transaction Models – Rollback Process – Two-phase Commit Protocol – Query Processing – Recovery.

(Self Study: Mobile Transaction Models)

UNIT-IV: MOBILE AD HOC NETWORKS(K2) (12 hours)

Ad-Hoc Basic Concepts – Characteristics – Applications – Design Issues – Routing– Essential of Traditional Routing Protocols – Popular Routing Protocols – Vehicular Ad Hoc networks (VANET) – MANET Vs VANET – Security.

UNIT-V: MOBILE PLATFORMS AND APPLICATIONS (K2) (12 hours)

Operating System Responsibilities in Mobile Devices - Mobile O/S Basic Concepts– Special Constrains & Requirements – Commercial Mobile Operating Systems – Android Software Development Kit - Applications of M-Commerce – Business to Business Applications- Structure – Pros & Cons – Mobile Payment System – Security Issues.

TEXT BOOK:

1. Prasant Kumar Pattnaik, RajibMall, *Fundamentals of Mobile Computing* (2nd Edition), PHI Learning Pvt. Ltd, New Delhi, India. (2012)

REFERENCE BOOKS

1. Jochen H. Schller, *Mobile Communications* (2nd Edition), Pearson Education, New Delhi, India.(2007)
2. UweHansmann, LotharMerk, Martin S. Nicklons and Thomas Stober, *Principles of Mobile Computing*, Springer, USA. (2003)
3. William.C.Y.Lee, *Mobile Cellular Telecommunications-Analog and Digital Systems* (2nd Edition), TataMcGraw Hill Edition, USA. (2006)

BLENDED LEARNING

UNIT V: MOBILE PLATFORMS AND APPLICATIONS	
Topic	**Link**
Mobile Operating Systems	https://www.youtube.com/watch?v=ujgL44AEUzs https://www.youtube.com/watch?v=hhfmiE5Kmxs
Android Software Development Kit	https://www.youtube.com/watch?v=Ux5rGubwEOw
Applications of M-Commerce	https://www.youtube.com/watch?v=mdGkR-dVqMc https://www.youtube.com/watch?v=FAdbTAhQstY
Mobile Payment System	https://www.youtube.com/watch?v=U6DkKnT7-Yg
Security Issues.	https://www.youtube.com/watch?v=fDWZs1IfJ48
Emerging Technologies	https://www.coursera.org/learn/smart-device-mobile-emerging-technologies

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3		2	2	2	2		3		3	3	3	3	2
CO2	3		3	2	3	3	2		3	2	3	3	3	3
CO3	3	2		2	3	2		2	3	3	3	3	3	2
CO4	3	2	3		3	3	3		2	2	3	3	2	3
CO5	3	3			3	3	2	2	3	3	2	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
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7	Case Study(Unit V)	Once in a Semester

Course Designed by: Ms.S.Kulandai Teresa	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

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SEMESTER: V

COURSE CODE: 23UCA5SB3

TITLE OF THE COURSE: SKILL BASED - ANDROID APPLICATIONS LAB

(INDUSTRY 4.0) (Employability, Skill Development)

COURSE OBJECTIVES:

- To learn the basics of Android platform and get to understand the application lifecycle.
- To implement applications with Android platform.

COURSE OUTCOMES

At the end of the Course the students will be able to:

CO1	Apply GUI, Layouts and Event Listener and create android applications	**K3**
CO2	Demonstrate and create android applications using Databases, Multi-threading and interactive interface	**K3**
CO3	Record: Implement Program and present Result	**K3**

Credits:2 **Instructional Hours : 45**

LIST OF PRACTICALS

1. Develop an application that uses GUI components, Font and Colours
2. Develop an application that uses Layout Managers and event listeners.
3. Write an application that draws basic graphical primitives on the screen.
4. Develop an application that makes use of database.
5. Implement an application that implements multi-threading.
6. Implement an application that writes data to the SD card.
7. Develop a native application that uses GPS location information.
8. Develop a native calculator application.

MAPPING OF COs WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	3	2	3	2	2	3	2	3		2	2	3	3	2
CO2	3	2	3	2	2	3	2	3			2	3	3	2
CO3	3	3	3	3	2	3	2	3			2	3	3	2

(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by: Ms. S. Kulandai Teresa	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC :Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: VI

COURSE CODE: 23UCA6C10/ 23UCS6C10

TITLE OF THE COURSE: CORE: SOFTWARE ENGINEERING

(Entrepreneurship, Employability)

COURSE OBJECTIVES:

- To inculcate knowledge on different phases of Software Engineering.
- To educate on various mechanisms and tools for creating quality software in various scenarios.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Associate the problem scenario with appropriate software solution strategy.	**K2**
CO2	Estimate the cost for particular software development process using various cost estimation methods.	**K2**
CO3	Compare various design techniques and problem-solving guidelines using modern programming language.	**K2**
CO4	Relate the relevant software testing strategy to ensure the correctness and quality of the product.	**K2**
CO5	Discussthe software engineering tools for different problem areas including web applications using reengineering techniques and tools.	**K2**

SYLLABUS

Credits: 4 **Instructional Hours :60**

UNIT-I: SOFTWARE PROJECT PLANNING CONCEPTS (K2) (12 hours)

Introduction – Definitions – Size factors – Quality and Productivity Factors – Managerial Issues – Planning a Software Project - Defining the Problem- Developing a Solution Strategy – Planning Development Process – Planning an Organizational Structure.

UNIT-II: SOFTWARE COST ESTIMATION (K2) (12 hours)

Software Cost Factors – Software Cost Estimation Techniques – Estimating Software Maintenance Costs - Software Requirements Definition - Software Requirements Specification-Formal Specification Techniques.

UNIT-III: SOFTWARE DESIGN AND IMPLEMENTATION CONCEPTS(K2) (12 hours)

Software Design – Fundamental Design Concepts - Design Notations – Design Techniques –User Interface Design – Interface design activities - Structured Coding Techniques - Modern Programming Language Features - Introduction – Type Checking – User Defined Data Types – Data Abstraction – Exception Handling.

(Beyond the Curriculum: Modularity in Model Checking)

UNIT-IV: SOFTWARE TESTING STRATEGIES(K2) (12 hours)

Software Testing Strategies – Strategic Approach to Software Testing – Validation Testing - System Testing – Art of Debugging –Software Testing Techniques – Software Testing Fundamentals - White Box Testing – Basis Path Testing – Control Structure Testing – Black Box Testing.

UNIT-V: SOFTWARE REENGINEERING AND CASE TOOLS (K2) (12 hours)

Mapping Requirements into a Software Architecture – Transform Mapping – Transaction Mapping. Software Quality – Software Reengineering – Reverse Engineering – Building Blocks for CASE – A Taxonomy Of CASE Tools.

(Self Study: Issues in Software Maintenance)

TEXT BOOKS:

1. Richard Fairley, *Software Engineering Concepts*(3rd Edition) reprint, Tata McGraw Hill Publication Company,(2010).
2. Roger S. Pressman, *Software Engineering*(5th Edition), McGraw Hill International,United States. (2010)

REFERENCE BOOKS:

1. Ian Sommerville, *Software Engineering*(5th Edition), Pearson Education.(2003)
2. Rajib Mall, *Fundamentals of Software Engineering* (4th Edition), Eastern Economy Edition, Prentice-Hall India,(2014).
3. ClaesWohlin, Per Runeson, Martin Höst, Magnus C. Ohlsson, BjörnRegnell, Anders Wesslén,*Experimentation in Software Engineering* (1st Edition),Springer,(2012).

BLENDED LEARNING

UNIT IV: SOFTWARE TESTING STRATEGIES	
Topic	**Links**
Software testing strategies	https://www.youtube.com/watch?v=7eHES5V8YPA
The Art of Debugging	https://www.youtube.com/watch?v=0Mcn8atRGfU
Validation testing	https://www.youtube.com/watch?v=5_GA2XHb8zY
System testing	https://www.youtube.com/watch?v=bp9qi3R7K0U

UNIT V: SOFTWARE REENGINEERING AND CASE TOOLS	
Topic	**Links**
Software Reengineering	https://www.youtube.com/watch?v=51BY-x3LeV8
Reverse engineering -	https://www.youtube.com/watch?v=3XQvaxYEI48

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		2	2	2	2	3		3	3	3	3
CO2	2	3			3	3		3	2		3	3	3	2
CO3	3	3	2	2	2		2	2	2	3	3	3	3	3
CO4	3	3	2	2	2	2	2	3		2	3	3	3	3
CO5	3	3	2	2	2	2	3	3	2	3	3	3	3	3

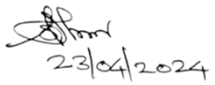
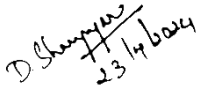
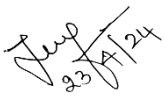
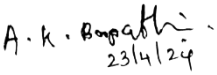
(Correlation: 3-High, 2-Medium, 1-Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model	Once in a Semester
5	Assignment (Unit I &II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Case Study (Unit V)	Once in a Semester

Course Designed by:Ms. M. Lincy Jacquline	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC:Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani **Associate Professor,** **Department of Computer Applications,** **Sri Ramakrishna College of Arts & Science (Autonomous).** **Coimbatore –641006.**	**Dr.D.Shanmuga Priyaa** **Assistant Professor,** **Department of Computer Science,** **Sri Krishna Adithya College of Arts and Science,** **Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi** **Head, Department of Information Technology,** **Rathinam College of Arts and science** **Coimbatore-641021.**	**Dr.T.Deepa** **Associate Professor,** **KPR College of Arts and Science,** **Coimbatore.**	**Mr.K. Boopathikumar** **Trainer/Full Stack Developer/Data Scientist,** **CEO, Training Trains,** **New Siddhapudur,** **Coimbatore – 641 044.**

SEMESTER : VI

SUBJECT CODE :23UCA6C11

TITLE OF THE COURSE: CORE PAPER: PROGRAMMING IN .NET
(Employability)

COURSE OBJECTIVES:

- To inculcate the knowledge of Dot Net programming concepts.
- To design and develop Windows based applications using Visual Basic .net that meet commercial standards.
- To develop Web based applications using ASP .Net and connecting data sources using ADO.net

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Illustrate the fundamental concepts of Visual Basic.net	**K2**
CO2	Implement simple programs by using windows Form controls.	**K3**
CO3	Construct Applications using File IO and Control Applications.	**K3**
CO4	Implement database applications using ADO .Net.	**K3**
CO5	Demonstrate database Access in Web Application.	**K3**

SYLLABUS

Credits: 4 **Instructional Hours :75**

UNIT-I: FUNDAMENTALS OF VISUAL BASIC.NET (K2) (15 hours)

Introduction to .NET: .Net Defined -The .Net Frame Work - Object - Oriented Programming and VB.Net - Encapsulation - Inheritance - Polymorphism - Creating a window Form Application - Creating a web Form Application - Data Types and Variables and Operators: VB.Net Data Types - Declaring variables - Constants - Variable Scopes - Type Conversions - Operators.

UNIT-II: ARRAYS AND WINDOWS FORM CONTROLS (K3) (15 hours)

Arrays: Introduction to Array - Multidimensional Array - Dynamic Array - Array Class Members -Conditional Logic: If Then Else Statement - The Select Case Statement - Do Loop - While - End While Statement - For Next Statement - For Each Next Statement -

Procedures: Procedures Overview - Types Of Procedures - Build-in Functions - Dialog Boxes: Introduction – MessageBox Class – Common Dialog Class

(Self Study: Dialog Boxes)

UNIT-III: FILE IO AND CLASSES (K3) (15 hours)

File IO: Introduction to IO - Directory and DirectoryInfo Class - Reading and Writing Files - Error Handling: Errors in Programming - Structured exception Handling - Classes and Objects: Introduction - Creating a Class- Class Block - Inside Classes - Overloading and Overriding - Constructors and Destructors - Multithreading: Creating Multithreaded applications

UNIT-IV: VISUAL BASIC AND DATA ACCESS USING ADO.NET (K3) (15 hours)

Visual Basic .NET IDE: The Start Page - First Visual Basic .NET Solutions - The IDE - Introduction to Data Access in .NET - Open Database Connectivity - OLEDB - ADO .NET Structures ADO.NET: Accessing ADO.NET Features and Namespaces - Using ADO.NET - Data Access in Visual Studio .NET

UNIT-V: DATABASE ACCESS IN WEB APPLICATION (K3) (15 hours)

Window Form: Introduction to Forms - Basics of the Window Form - Controls - Specific Controls: Base Controls - Derived Controls - Display Controls - Dialog Controls - Introduction to ASP.NEt: ASP.NET Controls - Web Controls - User Controls - Validation Controls - User Controls - Building a simple User Control - Building a simple User Control - ASP.NET Applications: Creating a Web Applications.

(Beyond the Curriculum: Progressive Web Apps, Cross-platform Apps Serverless Development)

TEXT BOOK:

1. Bill Evjen ,JasonBeres , Etal., *Visual Basic .Net Programming Bible* , Wiley India Pvt. Ltd, (2014).

REFERENCE BOOKS:

1. Bill Evjen, Jason Beres,*Visual Basic .NET Programming Bible***,**Wiley India Pvt.Ltd
2. Mattj.Crouch, *ASP.Net and VB.Net Web Programming* (1st Edition). Pearson Education.(2002)

BLENDED LEARNING

UNIT V: DATABASE ACCESS IN WEB APPLICATION	
Topics	**Link**
Basics of the Window Form	https://www.youtube.com/watch?v=nif7ViGaNrs
Controls	https://www.youtube.com/watch?v=rY3nDOaD878
Introduction to ASP.NET	https://www.youtube.com/watch?v=IZ4sJVgsv_I
Building a simple User Control	https://www.youtube.com/watch?v=_JciF4fa4mo
ASP.NET Applications	https://www.youtube.com/watch?v=xhPHMXu1agM
Creating a Web Applications	https://www.youtube.com/watch?v=z7AtCqsaioI

MAPPING OF CO'S WITH POs AND PEOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	3	3	2	-	2	-	2	-	2	-	-	2	2
CO2	3	2	3	2	-	-	3	2	2	3	-	3	3	3
CO3	3	3	2	2	2	-	3	2	2	3	2	3	3	3
CO4	3	3	3	3	2	3	3	2	2	3	2	3	3	3
CO5	3	3	2	2	2	2	3	2	2	3	2	3	3	3

(Correlation: 3- High, 2 -Medium, 1- Low**)**

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
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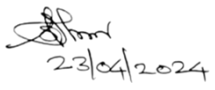
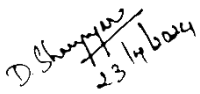
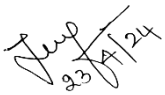
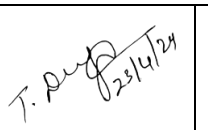
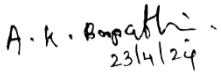
5	Assignment (Unit I & II)	Once in a Semester
6	Seminar (Unit III & IV)	Once in a Semester
7	Group Discussion (Unit V)	Once in a Semester

Course designed by: Mrs. M. Judith Acquline	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by :** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani **Associate Professor,** **Department of Computer Applications,** **Sri Ramakrishna College of Arts & Science (Autonomous).** **Coimbatore –641006.**	**Dr.D.Shanmuga Priyaa** **Assistant Professor,** **Department of Computer Science,** **Sri Krishna Adithya College of Arts and Science,** **Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi** **Head, Department of Information Technology,** **Rathinam College of Arts and science** **Coimbatore-641021.**	**Dr.T.Deepa** **Associate Professor,** **KPR College of Arts and Science,** **Coimbatore.**	**Mr.K. Boopathikumar** **Trainer/Full Stack Developer/Data Scientist,** **CEO, Training Trains,** **New Siddhapudur,** **Coimbatore – 641 044.**

SEMESTER: VI

SUBJECT CODE: 23UCA6CP6

TITLE OF THE COURSE: CORE PRACTICAL: PROGRAMMING IN .NET

(Employability, Skill Development)

COURSE OBJECTIVES

- To inculcate knowledge on Visual Basic .Net programming concepts.
- To inculcate knowledge on ASP.NET And Web Applications

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Apply the Visual Basic .Net programming concepts to develop simple	**K2**
CO2	Demonstrate database access using web applications.	**K3**
CO3	Record: Implement program and present result.	**K3**

Credits:3 **Instructional Hours: 75**

LIST OF PRACTICALS

1. Create a program to develop a calculator using operators.
2. Create a program to display date in various formats.
3. Create a program to implement inheritance concepts.
4. Create a program using Arrays.
5. Create a program to calculate student attendance using decision making Statements.

6. Create a program using menus and toolbars.
7. Create a program to print the Employee details using class and objects.
8. Develop a simple project for Railway Reservation System
9. Create a table salesman with the following field

   a) ID b)Name c)Phone number d) Sales Amount

   List all the contents of the table and list the details of the sales amount exceeda RS.20,000/- using ADO.NET
10. Create a web format that uses validation controls to check the user's input .The web format should contain the following fields.

    A) Card Holder b) Card Number c) Expression d) Payment Type

    Each textbox should have a corresponding required Field Validator.

    - The Card Number: Textbox should use a Regular Expression Validator to check that only digits were entered.(Dashes and Spaces should not be allowed)
    - The Expiration (MM/YY): Textbox should use a Regular Expression Validator check that input matches MM/YY.
11. Create a web Application using User Control.
12. Create a web Application for a shopping mall using session tracking in ASP.NeT

MAPPING OF CO'S WITH POs AND PEOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	2	-	2	2	3	1	2	2	-	3	-	-	2
CO2	-	3	3	2	-	3	2	1	1	2	2	2	-	2
CO3	2	3	3	1	2	-	2	2	2	3	1	2	-	3
CO4	2	2	2	-	2	2	1	1	-	3	2	2	2	-
CO5	2	3	3	1	2	3	-	2	2	2	2	-	3	-

(Correlation: 1-Low, 2-Medium, 3-High**)**

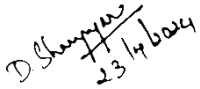
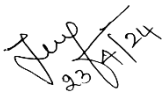
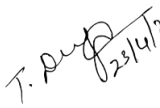
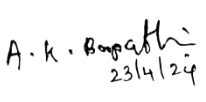
ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**

1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
5	Observation Note	Once in a Semester
6	Record Note	Once in a Semester

Course Designed by: Ms.M.Judith Acquline	**Verified by HOD:Ms.E.Sylvia**
Checked by CDC:Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: VI

COURSE CODE:23UCA6E01

TITLE OF THE COURSE: ELECTIVE - INTERNET OF THINGS

(INDUSTRY 4.0)(Employability)

COURSE OBJECTIVES

- To know the fundamentals of Internet of Things.
- To learn about the basic components of IoT.
- To understand various opportunities to work with IoT.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Understand the basic ideas of IoT	**K2**
CO2	Learn the functional design of the IoT based devices	**K2**
CO3	Design and implement an IoT device for a given problem-domain	**K3**

CO4	Understand the areas in which IoTs can be designed	**K2**
CO5	Master the basics of IoT design methodologies	**K3**

SYLLABUS

Credits : 4 **Instructional Hours : 75**

UNIT I: INTRODUCTION TO IoT (K2) (15 hours)

Introduction – Definition and Characteristics - Physical Design of IoT. Logical Design of IoT – Functional blocks, Communication models and APIs. IoT enabling technologies – WSN, Cloud computing, Big data analytics, Embedded systems.

UNIT II: DOMAIN SPECIFIC IoTs (K2) (15 hours)

Home Automation – Smart lighting, Smart appliances, Smoke/Gas detectors. Cities – Smart parking, Surveillance, Emergency response. Environment – Weather monitoring, Air pollution, River flood detections. Health & Lifestyle – Health and Fitness monitoring, Wearable devices.

(Self-Study: Weather Monitoring)

UNIT III: IoT DESIGN METHODOLOGY (K3) (15 hours)

Introduction – Purpose and requirements specification, Process specification, Domain model specification, Information model specification, Service specification, IoT level specification, Functional view specification, Operational view specification, Device and component integration, Application development.

UNIT IV: IoT PHYSICAL DEVICES AND ENDPOINTS (K2) (15 hours)

IoT Device – Building blocks of IoT. Exemplary Device: Raspberry PI - About the Board - Linux on Raspberry PI - Raspberry PI Interfaces – Serial interfaces, SPI, I2C. Programming Raspberry PI with Python – Controlling and interfacing LED switches. Other IoT Devices – pcDuino, BeagleBone Black, Cubieboard - Amazon web services for IoT.

UNIT V: CASE STUDIES ILLUSTRATING IoT DESIGN (K3) (15 hours)

Home Automation – Home Intrusion Detection. Productivity Applications – IoT printers.

TEXT BOOK :

1. ArshdeepBahga, Vijay Madisetti, *Internet of Things:A Hands-On Approach* (1st Edition), VPT Publishers, India, (2014).

REFERENCE BOOKS:

1. Adrian McEwen, Hakim Cassimally, *Designing the Internet of Things*, Wiley Publications, India. (2013).
2. CunoP fister, *Getting Started with the Internet of Things: Connecting Sensors and Microcontrollers to the Cloud* (1st Edition), Maker Media Inc, USA(2011).
3. Ahmed Banafa, *Secure and Smart Internet of Things (IoT) Using Blockchain and Artificial Intelligence (AI)* (1st Edition), River Publishers, Denmark.(2019).

BLENDED LEARNING

UNIT IV: IOT PHYSICAL DEVICES AND END POINTS	
Topics	**Link**
IoT Device	https://www.youtube.com/watch?v=17HMbyNaDjM
Building blocks of IoT	https://www.youtube.com/watch?v=tiK3cX-Yf14
Exemplary Device:RaspberryPI,About the Board	https://www.youtube.com/watch?v=QlApoEKGfU4
Linux on Raspberry PI	https://www.youtube.com/watch?v=iQZN3kEylqM&t=69s
Raspberry PI Interfaces	https://www.youtube.com/watch?v=OOKK9RCHj9A&t=5s
Serial interfaces	https://www.youtube.com/watch?v=ODKOfLL7sB4
SPI	https://www.youtube.com/watch?v=qyHaiDMf7p4
I2C	https://www.youtube.com/watch?v=HGX457RA4IU
Programming Raspberry PI with Python	https://www.youtube.com/watch?v=RpseX2ylEuw
Controlling and interfacing LED switches	https://www.youtube.com/watch?v=ksNbEuhO4fU
Other IoT Devices– pcDuino, BeagleBone Black, Cubieboard	https://www.youtube.com/watch?v=Gaz7BnMEWdc
Amazon web services for IoT	https://www.youtube.com/watch?v=etrELgrffrc

MAPPING OF CO'S WITH POs AND PSOs

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**

CO1	3	3	2	3	3	2	2		2	2		3	3	3
CO2	3	3	3				2	2	3		2	3	3	2
CO3	3	3	3	2	3			2	3		2	3	3	2
CO4	3	3	3	2	3	2			3	3	3	3	3	3
CO5	3	3	3	2	3	2			2		2	3	3	2

(Correlation: 3-High, 2 – Medium, 1 – Low**)**

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**FrequencyofAssessment**
1.	End Semester Examination	Once in a Semester
2.	CIA I	Once in a Semester
3.	CIA II	Once in a Semester
4.	Model	Once in a Semester
5.	Assignment (Unit I & II)	Twice in a Semester
6.	Seminar (Unit III & IV)	Twice in a Semester
7.	Hands on Training (Unit V)	Once in a Semester

Course Designed by: Ms.M. Muthumalathi	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

23/04/2024	23/4/2024	23/4/24	23/4/24	23/4/24
Dr.S.Thavamani Associate Professor, Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Dr.D.Shanmuga Priyaa Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**Dr.T.Deepa Associate Professor, KPR College of Arts and Science, Coimbatore.**	**Mr.K. Boopathikumar Trainer/Full Stack Developer/Data Scientist, CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: VI

COURSE CODE: 23UCA6E02

TITLE OF THE COURSE: ELECTIVE-DIGITAL MARKETING

(Entrepreneurship)

COURSE OBJECTIVES:

- To Introduce to the basic concepts of Digital Marketing.
- To Study the Techniques of Search Engine Optimization.

- To choose the appropriate strategies and plans of Online Advertising and Marketing.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Explain the fundamental concepts behind digital marketing.	**K2**
CO2	Understandthe strategies and techniques used in Search Engine Optimisation.	**K2**
CO3	Illustrate the importance of Content Marketing, Business Analysis and Web Presence	**K3**
CO4	Demonstrate the functioning of Online Advertising and Mobile marketingstrategy andplan.	**K3**
CO5	Illustrating Web Analytics, E-mail and Social Media Marketing.	**K3**

SYLLABUS

Credits : 4 **Instructional Hours : 75**

UNIT-I: INTRODUCTION TO DIGITAL MARKETING (K2) (15 hours)

Difference between Traditional Marketing and Digital Marketing- Benefits of using Digital Media -Inbound and Outbound Marketing- Online marketing POEM: (Paid, Owned, and Earned Media)-Components of Online Marketing (Email, Forum, Social network, Banner, Blog)- Impact of Online Marketing- Basics of Affiliate Marketing- Viral Marketing- Influencer Marketing-Referral Marketing.

(Self-Study: Influencer Marketing)

UNIT-II: SEARCH ENGINE OPTIMISATION (SEO) (K2) (15 hours)

About SEO - Need of an SEO friendly website - Importance of Internet andSearchEngines- Role of Keywords in SEO - On-Page Optimization (Onsite):Basics of Website Designing / Development -HTML Basics for SEO- Onsite Optimization Basics - Website Structure and Navigation Menu Optimization-SEO Content Writing- Off Page Optimization: Introduction; Local marketing of websites depending on locations; Promoting Subsequent pages of the website - Introduction to organic SEO vs non-organic SEO- Social Media Optimization Techniques and Page Rank Technology.

UNIT-III: CONTENT MARKETING, ANALYSIS AND WEB PRESENCE(K3) (15 hours)

Content Marketing Strategy: Goals and concepts - Strategic building blocks -Content creation & channel distribution - Tools of the trade - Advantages and challenges – Keywords Research and Analysis: Introduction to Keyword Research –Business Analysis - Types of Keywords – Keywords Analysis Tools - Web Presence: How to increase online

presence and drive more traffic for awebsite - Search result visibility in search engines for chosen keyword andphrases- Using e-mail marketing to drive traffic for a website - Posting socialmedia content for lead generation - Tools to create and manage content - Use of Blogging as content strategy.

UNIT-IV: ONLINE ADVERTISING, MOBILEMARKETING (K3) (15 hours)

Introduction to Online Advertising and its advantages –Paid versus Organic –Pay Per Click (PPC) Model. Cost per Click (CPC) – CPM – CTR - CR- Mobile Marketing-Objectives of Mobile Advertising - Creating a Mobile Marketing Strategy-Introduction to SMS Marketing.

UNIT V:WEB ANALYTICS AND SOCIAL MEDIA MARKETING(K3) (15 hours)

Web Analytics: About Web Analytics – Types of Web Analytics (On-site,Off-site) – Importance of Web Analytics – Email Marketing: Email newsletters –Digests –Dedicated Emails –Lead Nurturing - Sponsorship Emails and Transactional Emails - Drawbacks of Email Marketing -Social Media Marketing (SMM): Different types of Social Media Marketing.

TEXTBOOKS:

1. Puneet Singh Bhatia, *Fundamentals of Digital Marketing* (1st Edition, Pearson Publication.(2017)
2. Vandana Ahuja, *Digital Marketing* (1stEdition), OUP India Publications.(2015)
3. Shivani Karwal, *Digital Marketing Handbook* (1st Edition), Create space Independent Publications.(2015)

REFERENCE BOOKS

1. Ian Dodson, *The Art of Digital Marketing: The Definitive Guide to Creating Strategic, Targeted and Measurable Online Campaigns*(1st Edition), Publication Wiley India Pvt Ltd.(2016)
2. Philip Kotler, Hermawan Kartajaya, Iwan Setiawan, *Marketing 4.0: Moving from Traditional to Digital* (1st Edition), Publication Wiley India Pvt Ltd.(2016)

BLENDED LEARNING

UNIT V: WEB ANALYTICS, E-MAIL AND SOCIAL MEDIA MARKETING	
Topics	**Link**
Web Analytics	https://www.youtube.com/watch?v=zEUrfmpHXLg

E-Mail Marketing	https://www.youtube.com/watch?v=AzcSQl_MEeo
Social Media Marketing	https://www.youtube.com/watch?v=KEirK5QWgrA

MAPPING OF COs WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2			2	2			2		3		3
CO2	3	3	2		3	3	3		2	3	2	3	3	
CO3	3	3	3	2	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3	2	3		3
CO5	3	3	3	2	3	3	3	3	3	3	2	3	3	3

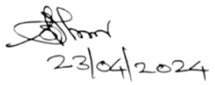
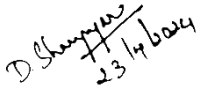
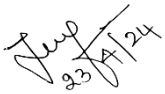
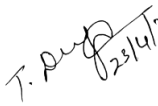
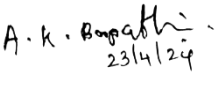
(Correlation: 3-High, 2 – Medium, 1 – Low**)**

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1.	End Semester Examination	Once in a Semester
2.	CIA I	Once in a Semester
3.	CIAII	Once in a Semester
4.	Model	Once in a Semester
5.	Assignment (UnitI & II)	Twice in a Semester
6.	Seminar (UnitIII & IV)	Twice in a Semester
7.	Online Quiz (Unit V)	Once in a Semester

Course Designed by: Ms.S.Kulandai Teresa	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

MEMBERS OF BOARD OF STUDIES:

				
Dr.S.Thavamani **Associate Professor,** **Department of Computer Applications,** **Sri Ramakrishna College of Arts & Science (Autonomous).** **Coimbatore –641006.**	**Dr.D.Shanmuga Priyaa** **Assistant Professor,** **Department of Computer Science,** **Sri Krishna Adithya College of Arts and Science,** **Coimbatore-641042.**	**Dr.K.Juliana Gnanaselvi** **Head, Department of Information Technology,** **Rathinam College of Arts and science** **Coimbatore-641021.**	**Dr.T.Deepa** **Associate Professor,** **KPR College of Arts and Science,** **Coimbatore.**	**Mr.K. Boopathikumar** **Trainer/Full Stack Developer/Data Scientist,** **CEO, Training Trains,** **New Siddhapudur,** **Coimbatore – 641 044.**

SEMESTER : VI

COURSE CODE :23UCA6SB4

TITLE OF THE COURSE: SKILL BASED: TESTING LAB

(Employability, Skill Development)

COURSE OBJECTIVES:

- Understand the concept and need of software testing.
- Understand the need and usage of software tools required for manual and automated testing.

COURSE OUTCOMES

At the end of the Course the students will be able to:

CO1	Demonstrate the ability to apply Selenium tool to check the reliability of a software system and to identify and apply redundancy for a medium-sized application.	**K3**
CO2	Examine the data driven testing and check the validation for the inputs.	**K3**
CO3	Record: Implement Program and present Result.	**K3**

Credits: 2 **Instructional hours : 45**

LIST OF PRACTICALS

1. Create and record a project using Selenium IDE.
2. Write a program to open a specific web page.
3. Write a program to provide the total number of links available on the web page.
4. Write a program to select the specified item from the combo box.
5. Write a program to count the number of check boxes on the page checked and unchecked count.
6. Write a program to display values to the Excel worksheet cell.
7. Write a program using Radio Buttons.
8. Write a program and perform data driven testing line by line.

MAPPING OF COs WITH POs AND PSOs

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CO1	3	3	3	3	3	3	3	3	3	2	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

(**Correlation:** 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	**Assessment Methods**	**Frequency of Assessment**
1	End Semester Examination	Once in a Semester
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3	CIA II	Once in a Semester
4	Observation Note	Once in a Semester
5	Record Note	Once in a Semester

Course Designed by: Dr.S. Beula Princy	**Verified by HOD: Ms. E. Sylvia**
Checked by CDC: Ms. A. Jansi Rani	**Approved by:** **Principal**

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Department of Computer Applications, Sri Ramakrishna College of Arts & Science (Autonomous). Coimbatore –641006.	**Assistant Professor, Department of Computer Science, Sri Krishna Adithya College of Arts and Science, Coimbatore-641042.**	**Head, Department of Information Technology, Rathinam College of Arts and science Coimbatore-641021.**	**KPR College of Arts and Science, Coimbatore.**	**CEO, Training Trains, New Siddhapudur, Coimbatore – 641 044.**

SEMESTER: V & VI

COURSE CODE: 23UCASB03

TITLE OF THE COURSE: INTER DISCIPLINARY SKILL BASED - ILLUSTRATIVE DESIGNING LAB

(Skill Development)

COURSE OBJECTIVES:

- To create a graphical presentation with Illustrator tool.
- To create a Logo design with Illustrator tool.

COURSE OUTCOMES

At the end of the course the students will be able to:

CO1	Demonstrate the tools for working with images.	**K3**
CO2	Illustrate the tools for designing Logo and Images	**K3**
CO3	Record: Implement Program and present result	**K3**

Credits: 2 **Instructional Hours: 45**

LIST OF PRACTICALS

1. Draw a simple image using lines and shapes.
2. Create an artwork and assign colors using tools.
3. Trace a bitmap image.
4. Create an image using fills and strokes.
5. Design an image with drop shadows, glows, and feathering effects.
6. Create a fresh and artful watercolor text vector image.

7. Create a smooth Satin background using blends
8. Create a Logo design.

MAPPING OF CO'S WITH POsAND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	3	2	2		2			2	2	3	3
CO2	3	3		3	3	3		2		2		2	3	3
CO3	3	3	2	3	3	3		2		2	2	3	3	3

(Correlation: 3-High, 2 – Medium, 1 – Low**)**

ASSESSMENT TOOLS

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Course Designed by:Dr.S.BeulaPrincy	**Verified by HOD:Ms. E. Sylvia**
Checked by CDC:Ms.A.Jansi Rani	**Approved by:** **Principal**

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