BCA

Syllabus

Program Code: UCA

2023 - Onwards

GUIDLINESS FOR OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM

(FOR UG PROGRAM FROM 2023 -2024 ONWARDS)

ELIGIBILITY FOR ADMISSION

Candidates seeking admission to the UG Degree program must have passed the Higher Secondary Education (respective groups – Arts / Science) of the Government of Tamil Nadu or any other state or its equivalent qualification.

DURATION OF THE COURSE

The duration of the course shall be three academic years comprising six semesters with two semesters in each academic year.

Subjects of Study
Part I   : Tamil / Hindi /
Part II : English
Part III :
      1.Core Subjects
      2.Allied Subjects
      3.Electives
 Part IV:
      1.Non Major Electives (I Year)
      2.Skill Based Subjects
      3.Environmental Studies - Mandatory Subject
      4.Value Education - Mandatory Subject
Part V :
      Extension Activities

ARTS & SCIENCE

CBCS COURSE STRUCTURE FOR UG PROGRAMS

Sem I	Credit	Sem II	Credit	Sem III	Credit	Sem IV	Credit	Sem V	Credit	Sem VI	Credit
1.1. Language - Tamil	3	2.1. Language - Tamil	3	3.1. Language - Tamil	3	4.1. Language - Tamil	3	5.1 Core Course – \CC IX	4	6.1 Core Course – CC XIII	4
1.2 English	3	2.2 English	3	3.2 English	3	4.2 English	3	5.2 Core Course – CC X	4	6.2 Core Course – CC XIV	4
1.3 Core Course – CC I	4	2.3 Core Course – CC III	4	3.3 Core Course – CC V	4	4.3 Core Course – CC VII Core Industry Module	4	5.3. Core Course CC -XI	4	6.3 Core Course – CC XV	4
1.4 Core Course – CC II	4	2.4 Core Course – CC IV	4	3.4 Core Course – CC VI	4	4.4 Core Course – CC VIII	4	5.3. Core Course –/ Project with viva-voce CC -XII	4	6.4 Elective -VII Generic/ Discipline Specific	3
1.5 Elective I Generic/ Discipline Specific	3	2.5 Elective II Generic/ Discipline Specific	3	3.5 Elective III Generic/ Discipline Specific	3	4.5 Elective IV Generic/ Discipline Specific	3	5.4 Elective V Generic/ Discipline Specific	3	6.5 Elective VIII Generic/ Discipline Specific	3
1.6 Skill Enhancement Course SEC-1 (NME)	2	2.6 Skill Enhancement Course SEC-2 (NME)	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill)	1	4.6 Skill Enhancement Course SEC-6	2	5.5 Elective VI Generic/ Discipline Specific	3	6.6 Extension Activity	1
1.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-1	2	2.7 Skill Enhancement Course – SEC-3(NME)	2	3.7 Skill Enhancement Course SEC-5	2	4.7 Skill Enhancement Course SEC-7	2	5.6 Value Education	2	6.7 Professional Competency Skill	2
1.8 Skill Enhancement - (Foundation Course)	2	2.8 Ability Enhancement Compulsory Course (AECC) Soft Skill-2	2	3.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-3	2	4.7 7Ability Enhancement Compulsory Course (AECC) Soft Skill-4	2	5.5 Summer Internship /Industrial Training	2		
				3.8 E.V.S	-	4.8 E.V.S	2				
	23		23		22		25		26		21
Total Credit Points											140

QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL ASSESSMENT

Note: Duration – 1 hour

(FOR PART I, PART II & PART III)

The components for continuous internal assessment are:

Part –A

Four multiple choice questions (answer all)   4 x01= 04 Marks

Part –B

Two questions ('either …. or 'type)   2 x05= 10 Marks

Part –C

Two questions ('either …. or 'type)   2 x 08=16 Marks

                                      Total   30 Marks

THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:

(60 Marks of two continuous internal assessments will be converted to 15 marks)

Two   tests and their average   --15 marks

Seminar /Group discussion / Quiz Test   --5 marks

Assignment   --5 marks

            Total   25 Marks

QUESTION PAPER PATTERN FOR THE SUMMATIVE EXAMINATIONS:

Note: Duration- 3 hours

Part –A

Ten multiple choice questions   10 x01   = 10 Marks

No Unit shall be omitted: not more than two questions from each unit.)

Part –B

Five Paragraph questions ('either …. or 'type)   5 x 05   = 25 Marks

(One question from each Unit)

Part –C

Five Paragraph questions ('either …. or 'type)   5 x 08   = 40 Marks

(One question from each Unit)

                                            Total   75 Marks

PART-IV- SKILL BASED PAPERS / NME:

The Scheme of Examination for Skill Based Papers: (Except Practical Lab Subjects)

QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL ASSESSMENT (SKILL BASED AND NME COURSES) DURATION – 1 HOUR

❖ 50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and converted for 15 marks

THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:

Two   tests and their average   --15 marks

Seminar /Group discussion / Quiz Test   -- 5 marks

Assignment   -- 5 marks

                          Total   25 Marks

SUMMATIVE EXAMINATION PATTERN (SKILL BASED AND NME COURSES) DURATION – 3 HOURS

Pattern of the Question Paper for Skill Based and Non-Major Elective courses (External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)

(15MCQ's from each unit)

PART-IV- ENVIRONMENTAL STUDIES AND VALUE EDUCATION

QUESTION PAPER PATTERN (INTERNAL ASSESSMENT)

Pattern of the Question Paper for Environmental Studies & Value Education (Internal)

50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and converted for 15 marks

Two tests and their average	--	15 marks
Project	--	10 marks

Total		25 Marks
		--------------

* The students as Individual or Group must visit a local area to document environmental assets – river / forest / grassland / hill / mountain – visit a local polluted site – urban / rural / industrial / agricultural – study of common plants, insects, birds – study of simple ecosystem – pond, river, hill slopes, etc.

SUMMATIVE EXAMINATION PATTERN

Pattern of the Question Paper for Environmental Studies & Value Education only) (External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)

(15MCQ's from each unit)

PART V EXTENSION ACTIVITIES: (MAXIMUM MARKS: 100)

1. NCC
2. NSS
3. Physical Education
4. YRC
5. RRC
6. Health & Fitness Club
7. Eco Club
8. Human Rights Club

Internal Examinations   - - 25 Marks

Summative Examinations - - 75 Marks

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100

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OUTCOME BASED EDUCATION:

OBE starts with the identification and articulation of clear and measurable learning outcomes for each course or program. These outcomes describe the skills, knowledge, and abilities that students are expected to acquire. The curriculum, instructional methods, and assessments are aligned with the defined learning outcomes. This ensures that everything taught and evaluated is directly related to what students are expected to learn.

The Learning Outcomes-Based Approach to curriculum planning and transaction in our institution ensures whether the teaching-learning processes are oriented towards enabling students to attain the defined learning outcomes relating to the courses within a programme. The outcome based approach, particularly in the context of undergraduate studies, requires a significant shift from teacher-centric to learner-centric pedagogies and from passive to active/participatory pedagogies.

Assessment Method: The students are assessed with 2 internal examination and the summative examination which includes problem based assignments; practical assignment laboratory reports; observation of practical skills; individual project reports ,case-study reports; team project reports; oral presentations, including seminar presentation; viva voce interviews; computerized adaptive testing; etc. and any other pedagogic approaches as per the context.

INSTITUTIONAL VISION

To Mould the learners into accomplished individuals by providing them with a stimulus for social change through character, confidence and competence.

INSTITUTIONAL MISSION

1. Enlightening the learners on the ethical and environmental issues.

2. Extending holistic training to shape the learners in to committed and competent citizens.

3. Equipping them with soft skills for facing the competitive world.

4. Enriching their employability through career oriented courses.

5. Ensuring accessibility and opportunity to make education affordable to the underprivileged.

Highlights of the Revamped Curriculum:

- ➢ Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application oriented content wherever required.
- ➢ The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry / real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- ➢ The General Studies and Mathematics based problem solving skills are included as mandatory components in the 'Training for Competitive Examinations' course at the final semester, a first of its kind.
- ➢ The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.

➢ The Industrial Statistics course is newly introduced in the fourth semester, to expose the students to real life problems and train the students on designing a mathematical model to provide solutions to the industrial problems.

➢ The Internship during the second year vacation will help the students gain valuable work experience that connects classroom knowledge to real world experience and to narrow down and focus on the career path.

➢ Project with viva-voce component in the fifth semester enables the student, application of conceptual knowledge to practical situations. The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.

➢ State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Artificial Intelligence.

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS), MADURAI – 625 004
BACHELOR OF COMPUTER APPLICATIONS CURRICULUM
(For the student admitted during the academic year 2023-2024 onwards)

Course Code	Title of the Course	Hrs	Credits	Maximum Marks		
				Int	Ext	Total
FIRST SEMESTER						
Part – I	**Tamil / Hindi Course**					
23UTAGT11 / 23UHIGH11	தமிழ் இலக்கிய வரலாறு - I / HINDI KA SAMANYA GYAN AUR NIBANDH	6	3	25	75	100
Part – II	**English**					
23UENGE11	GENERAL ENGLISH - I	6	3	25	75	100
Part - III	**Core Courses**					
23UCACC11	PYTHON PROGRAMMING	5	5	25	75	100
23UCACP11	PYTHON PROGRAMMING LAB	5	5	25	75	100
Part - III	**Elective Course**					
23UMTEA12	NUMERICAL METHODS	4	3	25	75	100
Part IV	**Non Major Elective**					
23UCANM11	OFFICE AUTOMATION	2	2	25	75	100
Part IV	**Foundation Course**					
23UCAFC11	STRUCTURED PROGRAMMING IN C	2	2	25	75	100
	Total	**30**	**23**	**175**	**525**	**700**
SECOND SEMESTER						
Part – I	**Tamil / Hindi Course**					
23UTAGT21 / 23UHIGH21	தமிழ் இலக்கிய வரலாறு – II / KATHA SAHITYA AUR VYAKARAN	6	3	25	75	100
Part – II	**English**					
23UENGE21	GENERAL ENGLISH - II	6	3	25	75	100
Part - III	**Core Courses**					
23UCACC21	OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++	5	5	25	75	100
23UCACP21	C++ PROGRAMMING LAB	5	5	25	75	100
Part - III	**Elective Course**					
23UCAEC21	INTRODUCTION TO DATA SCIENCE	4	3	25	75	100
Part IV	**Non Major Elective**					
23UCANM21	UNDERSTANDING INTERNET	2	2	25	75	100
Part IV	**Skill Enhancement course**					
23UCASP21	ADVANCED EXCEL LAB	2	2	25	75	100
	Total	**30**	**23**	**175**	**525**	**700**

FIRST SEMESTER

Course Name	PYTHON PROGRAMMING			
Course Code	23UCACC11	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

➢ To make students understand the concepts of Python programming.
➢ To apply the OOPs concept in PYTHON programming.
➢ To impart knowledge on demand and supply concepts.
➢ To make the students learn best practices in PYTHON programming.
➢ To know the costs and profit maximization.

UNIT – I	Basics of Python Programming, Python Arrays	15

Basics of Python Programming: History of Python - Features of Python – Literal – Constants – Variables – Identifiers – Keywords - Built-in Data Types - Output Statements – Input Statements - Comments – Indentation – Operators – Expressions - Type conversions. Python Arrays: Defining and Processing Arrays–Array methods.

UNIT - II	Control Statements	15

Control Statements: Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.

UNIT - III	Functions, Strings	15

Functions: Function Definition – Function Call – Variable Scope and its Life time-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments- Recursion. Python Strings**:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement- The Python module – dir() function –Modules and Namespace– Defining our own modules.

UNIT - IV	Lists, Tuples, Dictionaries	15

Lists: Creating a list - Access values in List - Updating values in Lists - Nested lists - Basic list operations - List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple–Nested tuples – Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.

UNIT - V	Python File Handling	15

Python File Handling: Types of files in Python -Opening and Closing files-Reading and Writing files: write ( ) and write lines ( ) methods - append ( ) method – read ( ) and read lines ( ) methods–with keyword – Splitting words – File methods - File Positions - Renaming and deleting files.

	Total Lecture Hours	**75**

BOOKS FOR STUDY:

➢ Reema Thareja, Python Programming using problem solving approach, First Edition, 2017, Oxford University Press.
➢ Dr.R.Nageswara Rao, Core Python Programming, First Edition, 2017, Dreamtech Publishers.

BOOKS FOR REFERENCES:

➢ Vamsi Kurama, Python Programming: A Modern Approach, Pearson Education.
➢ Mark Lutz, Learning Python, Orielly.
➢ Adam Stewarts, Python Programming, Online.
➢ Fabio Nelli, Python Data Analytics, APress.
➢ Kenneth A.Lambert, Fundamentals of Python– First Programs, CENGAGE Publication.

WEB RESOURCES:

❖ **https://www.guru99.com/python-tutorials.html**
❖ **https://www.programiz.com/python-programming**
❖ **https://www.w3schools.com/python/python_intro.asp**
❖ **https://www.geeksforgeeks.org/python-programming-language/**
❖ **https://en.wikipedia.org/wiki/Python_(programming_language)**

Nature of Course	EMPLOYABILITY	✔	SKILL ORIENTED		ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL	✔
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✔

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Learn the basics of python, Do simple programs on python, Learn how to use an array.	K1 to K4
CO2	Develop program using selection statement, Work with Looping and jump statements, Do programs on Loops and jump statements.	K1 to K4
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.	K1 to K4
CO4	Work with List, Tuples and dictionary; Write program using list, Tuples and dictionary.	K1 to K4
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

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

<center>S- STRONG   M – MEDIUM   L – LOW</center>

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	2	3	3
CO 2	3	2	2	3	2
CO 3	3	2	2	3	2
CO 4	3	2	2	3	2
CO 5	3	2	2	3	3
WEITAGE	15	10	10	15	13
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	100	67	67	100	87

LESSON PLAN:

UNIT	PYTHON PROGRAMMING	HRS	PEDAGOGY
I	Basics of Python Programming: History of Python - Features of Python – Literal – Constants – Variables – Identifiers – Keywords - Built-in Data Types - Output Statements – Input Statements - Comments – Indentation – Operators – Expressions - Type conversions. Python Arrays: Defining and Processing	15	Black Board/PPT

	Arrays–Array methods.			
II	Control Statements: Selection / Conditional Branching statements: if, if-else, nested if and if-elif-else statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass statements.	15	**Black Board/PPT**
III	Functions: Function Definition – Function Call – Variable Scope and its Life time-Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments- Recursion. Python Strings**:** String operations- Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: import statement - The Python module – dir() function –Modules and Namespace– Defining our own modules.	15	**Black Board/PPT**
IV	Lists: Creating a list - Access values in List - Updating values in Lists - Nested lists - Basic list operations - List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple–Nested tuples – Difference between lists and tuples. Dictionaries: Creating, Accessing, Updating and Deleting Elements in a Dictionary – Dictionary Functions and Methods - Difference between Lists and Dictionaries.	15	**Black Board/PPT**
V	Python File Handling: Types of files in Python -Opening and Closing files-Reading and Writing files: write ( ) and write lines ( ) methods - append ( ) method – read ( ) and read lines ( ) methods–with keyword – Splitting words – File methods - File Positions - Renaming and deleting files.	15	**Black Board/PPT**

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A MCQs		Section B Either or Choice	Section C Either or Choice
			No. of. Questions	K - Level		
CI	**CO1**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
AI	**CO2**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
CI	**CO3**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
AII	**CO4**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
Question Pattern CIA I & II	**No. of Questions to be asked**		4		4	4
	No. of Questions to be answered		4		2	2
	Marks for each question		1		5	8
	Total Marks for each section		4		10	16

Distribution of Marks with K Level CIA I & CIA II

	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

S. No	COs	K - Level	Section A (MCQs) No. of Questions	Section A (MCQs) K – Level	Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
1	CO1	K1-K4	2	K1,K2	2 (K3)	2 (K4)
2	CO2	K1-K4	2	K1,K2	2 (K3)	2 (K4)
3	CO3	K1-K4	2	K1,K2	2 (K3)	2 (K4)
4	CO4	K1-K4	2	K1,K2	2 (K3)	2 (K4)
5	CO5	K1-K4	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level

K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.57	3.57
K2	5			5	3.57	3.57
K3		50		50	35.72	35.72
K4			80	80	57.14	57.14
Marks	10	50	80	140	100	100

NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level			
Answer **ALL** the questions		**PART – A**		**(10 x 1 = 10 Marks)**		
1.	Unit - I	CO1	K1			
				a)		b)
				c)		d)
2.	Unit - I	CO1	K2			
				a)		b)
				c)		d)
3.	Unit - II	CO2	K1			
				a)		b)
				c)		d)
4.	Unit - II	CO2	K2			
				a)		b)
				c)		d)
5.	Unit - III	CO3	K1			
				a)		b)
				c)		d)
6.	Unit - III	CO3	K2			
				a)		b)
				c)		d)
7.	Unit - IV	CO4	K1			
				a)		b)
				c)		d)
8.	Unit - IV	CO4	K2			
				a)		b)
				c)		d)
9.	Unit - V	CO5	K1			
				a)		b)
				c)		d)
10.	Unit - V	CO5	K2			
				a)		b)
				c)		d)

				Answer **ALL** the questions **PART – B** **(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K3**	
			OR	
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
			OR	
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K3**	
			OR	
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
			OR	
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
			OR	
15. b)	**Unit - V**	**CO5**	**K3**	

				Answer **ALL** the questions **PART – C** **(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K4**	
			OR	
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
			OR	
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
			OR	
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
			OR	
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
			OR	
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	PYTHON PROGRAMMING LAB			
Course Code	23UCACP11	**L**	**P**	**C**
Category	CORE	**-**	**5**	**5**

COURSE OBJECTIVES

➢ Be able to design and program Python applications.
➢ Be able to create loops and decision statements in Python.
➢ Be able to work with functions and pass arguments in Python.
➢ Be able to build and package Python modules for reusability.
➢ Be able to read and write files in Python.

S. No.	LAB EXERCISE	75
1.	Program using variables, constants, I/O statements in Python.	
2.	Program using Operators in Python.	
3.	Program using Conditional Statements.	
4.	Program using Loops.	
5.	Program using Jump Statements.	
6.	Program using Functions.	
7.	Program using Recursion.	
8.	Program using Arrays.	
9.	Program using Strings.	
10.	Program using Modules.	
11.	Program using Lists.	
12.	Program using Tuples.	
13.	Program using Dictionaries.	
14.	Program for File Handling.	
	Total Lecture Hours	**75**

BOOKS FOR STUDY:

- Dr.R.Nageswara Rao, Core Python Programming, First Edition, 2017, Dreamtech Publishers.
- Eric Matthes, Python Crash Course, 2nd Edition, 2019, No Starch Press.
- Mark Lutz, Learning Python, 5th Edition, 2013, O'Reilly Media.

BOOKS FOR REFERENCES:

- Al Sweigart, Automate the Boring Stuff with Python, 2nd Edition, 2019, No Starch Press.
- Wes McKinney, Python for Data Analysis, 2nd Edition, 2017, O'Reilly Media.
- KennethA.Lambert, Fundamentals of Python–First Programs, CENGAGE Publication.

WEB RESOURCES:

- ❖ **https://www.programiz.com/python-programming**
- ❖ **https://www.geeksforgeeks.org/python-programming-language/**
- ❖ **https://docs.python-guide.org/**
- ❖ **https://www.pythonweekly.com/**
- ❖ **http://pythontutor.com/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made			New Course	✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Demonstrate the understanding of syntax and semantics.	**K1 to K4**
CO2	Identify the problem and solve using PYTHON programming techniques.	**K1 to K4**
CO3	Identify suitable programming constructs for problem solving.	**K1 to K4**
CO4	Analyze various concepts of PYTHON language to solve the problem in an efficient way.	**K1 to K4**
CO5	Develop a PYTHON program for a given problem and test for its correctness.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	S	M	M	S	S	L
CO2	M	S	L	S	M	L	S	M	M	S
CO3	L	L	S	M	L	S	M	S	M	S
CO4	M	M	M	L	S	M	S	L	S	L

CO5	S	S	S	S	M	L	S	M	L	M

S- STRONG		M – MEDIUM		L – LOW	

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	2	2	2	2	3	2
CO 2	2	1	3	2	-	2
CO 3	3	3	1	1	1	2
CO 4	2	3	3	1	-	1
CO 5	3	2	3	1	1	-
WEITAGE	12	11	12	7	5	7
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	80	73	80	47	33	47

LESSON PLAN:

UNIT	PYTHON PROGRAMMING LAB	HRS	PEDAGOGY
1	Program using variables, constants, I/O statements in Python.		
2	Program using Operators in Python.		
3	Program using Conditional Statements.		
4	Program using Loops.		
5	Program using Jump Statements.		
6	Program using Functions.		
7	Program using Recursion.		Demonstration Hands-on Training
8	Program using Arrays.	75	
9	Program using Strings.		
10	Program using Modules.		
11	Program using Lists.		
12	Program using Tuples.		
13	Program using Dictionaries.		
14	Program for File Handling.		

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
Internal	**Cos**	**K Level**	**Syntax & Semantics**	**Programming principles**	**Concept Applications**	**Coding & Implementation**	**Debugging & Output**
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA		**No. of Questions to be asked**	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	2.5	2.5	2.5	2.5	2.5
		Total Marks for each section	5	5	5	5	5

Distribution of Marks with K Level CIA									
	K Level	**Syntax & Semantics**	**Programming principles**	**Concept Applications**	**Coding**	**Debugging & Output**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
CIA	K1	5					**5**	**20**	**20**
	K2		5				**5**	**20**	**20**
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						**25**	**100**	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

			Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No.	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level								
K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	15	15	15	15	15	75	100	100

Course Name	NUMERICAL METHODS			
Course Code	23UMTEA12	**L**	**P**	**C**
Category	ELECTIVE ALLIED	4	-	3

COURSE OBJECTIVES:

- To introduce the various topics in Numerical methods.
- To make understand the fundamentals of algebraic equations.
- To apply interpolation and approximation on examples.
- To solve problems using numerical differentiation and integration
- To solve linear systems, numerical solution of ordinary differential equations

UNIT - I FUNDAMENTALS OF ALGEBRAIC EQUATION:	12

Solution of algebraic and transcendental equations-Bisection method – Fixed point iteration method – Newton Raphson method –linear system of equations – Gauss elimination method – Gauss Jordan method

UNIT - II ITERATIVE, INTERPOLATION AND APPROXIMATION:	12

Iterative methods - Gauss Jacobi and Gauss Seidel – Eigen values of a matrix by Power method and Jacobi‟s method for symmetric matrices. Interpolation with unequal intervals – Lagrange‟s interpolation – Newton‟s divided difference interpolation

UNIT -III INTERPOLATION WITH EQUAL INTERVAL:	12

Difference operators and relations. -Interpolation with equal intervals – Newton‟s forward and backward difference formulae

UNIT - IV NUMERICAL DIFFERENTIATION AND INTEGRATION:	12

Approximation of derivatives using interpolation polynomials – Numerical integration using Trapezoidal, Simpson‟s 1/3 rule

UNIT - V NITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS:	12

Single step methods – Taylor‟s series method – Euler‟s method – Modified Euler‟s method - RungeKutta method for solving(first, second , Third and 4th) order equations – Multi step methods

	Total Lecture Hours	60

BOOKS FOR STUDY:

- Numerical Methods, Second Edition, S.Arumugam, A.ThangapandiIssac, A.Somasundaram, SCITECH publications, 2009.

BOOKS FOR REFERENCES:

- Mathews J.H. Numerical Method for Maths, Science and Engineering; PHI, New Delhi, 2001
- Iqbal H. Khan & Q. Hassan Numerical Methods for Engineers and Scientist - Galgotia Publications (P) Ltd., New Delhi – 1997
- M.K. Jain, S.R.K. Iyengar&R.K.Jain - Numerical Methods for Scientific and Engineering Computation - New Age International(P) Ltd., New Delhi – 1996

WEB RESOURCES:

- ❖ **Web resources from NDL Library, E-content from open-source libraries**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓

* Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Know how to solve various problems on numerical methods	K1 to K4
CO2	Use approximation to solve problems	K1 to K4
CO3	Differentiation and integration concept are applied	K1 to K4
CO4	Apply , direct methods for solving linear systems PO1, PO2,	K1 to K4
CO5	Numerical solution of ordinary differential equations	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	S	L	S	M	S	S	S	S
CO2	M	M	L	L	L	M	L	M
CO3	S	L	S	S	S	S	S	L
CO4	L	S	S	S	L	M	S	M
CO5	M	M	L	M	M	S	L	S

<p style="text-align:center">S- STRONG   M – MEDIUM   L - LOW</p>

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3
CO 2	3	3	3	2	3
CO 3	2	3	3	3	3
CO 4	3	3	3	3	2
CO 5	3	3	2	3	3
WEITAGE	14	15	14	15	14
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	93.3	100	93.3	100	100

LESSON PLAN:

UNIT	NUMERICAL METHODS	HRS	PEDAGOGY
I	Solution of algebraic and transcendental equations-Bisection method – Fixed point iteration method – Newton Raphson method –linear system of equations – Gauss elimination method – Gauss Jordan method	**12**	**LCD**
II	Iterative methods - Gauss Jacobi and Gauss Seidel – Eigen values of a matrix by Power method and Jacobi's method for symmetric matrices. Interpolation with unequal intervals – Lagrange's interpolation – Newton's divided difference interpolation	**12**	**LCD**
III	Difference operators and relations. -Interpolation with equal intervals – Newton's forward and backward difference formulae	**12**	**LCD**
IV	Approximation of derivatives using interpolation polynomials – Numerical integration using Trapezoidal, Simpson's 1/3 rul	**12**	**LCD**
V	Single step methods – Taylor's series method – Euler's method – Modified Euler's method - RungeKutta method for solving(first, second , Third and 4th) order equations – Multi step methods	**12**	**LCD**

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A MCQs No. of. Questions	Section A MCQs K - Level	Section B Either or Choice	Section C Either or Choice
CI AI	CO1	K1 – K4	2	K1,K2	2 (K3)	2(K4)
CI AI	CO2	K1 – K4	2	K1,K2	2(K3)	2(K4)
CI AII	CO3	K1 – K4	2	K1,K2	2(K3)	2(K4)
CI AII	CO4	K1 – K4	2	K1,K2	2(K3)	2(K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1-K4	2	K1,K2	2 (K3,K3)	2 (K4,K4)
2	CO2	K1-K4	2	K1,K2	2 (K3,K3)	2 (K4,K4)
3	CO3	K1-K4	2	K1,K2	2 (K3,K3)	2 (K4,K4)
4	CO4	K1-K4	2	K1,K2	2 (K3,K3)	2 (K4,K4)
5	CO5	K1-K4	2	K1,K2	2 (K3,K3)	2 (K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level

K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.57	3.57
K2	5			5	3.57	3.57
K3		50		50	35.72	35.72
K4			80	80	57.14	57.14
Marks	10	50	80	140	100	100

NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions			**PART – A**		**(10 x 1 = 10 Marks)**
	Unit - I	**CO1**	**K1**		
1.				a)	b)
				c)	d)
	Unit - I	**CO1**	**K2**		
2.				a)	b)
				c)	d)
	Unit - II	**CO2**	**K1**		
3.				a)	b)
				c)	d)
	Unit - II	**CO2**	**K2**		
4.				a)	b)
				c)	d)
	Unit - III	**CO3**	**K1**		
5.				a)	b)
				c)	d)
	Unit - III	**CO3**	**K2**		
6.				a)	b)
				c)	d)
	Unit - IV	**CO4**	**K1**		
7.				a)	b)
				c)	d)
	Unit - IV	**CO4**	**K2**		
8.				a)	b)
				c)	d)
	Unit - V	**CO5**	**K1**		
9.				a)	b)
				c)	d)
	Unit - V	**CO5**	**K2**		
10.				a)	b)
				c)	d)

Answer **ALL** the questions			PART – B	(5 x 5 = 25 Marks)
11. a)	**Unit - I**	**CO1**	**K3**	
			OR	
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
			OR	
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**		
			OR	
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
			OR	
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
			OR	
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions			PART – C	(5 x 8 = 40 Marks)
16. a)	**Unit - I**	**CO1**	**K4**	
			OR	
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
			OR	
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
			OR	
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
			OR	
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
			OR	
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	STRUCTURED PROGRAMMING IN C			
Course Code	23UCAFC11	**L**	**P**	**C**
Category	FOUNDATION COURSE	2	-	2

COURSE OBJECTIVES:

- ➢ To familiarize the students with the Programming basics and the fundamentals of C.
- ➢ Data Types in Mathematical and logical operations.
- ➢ To understand the concept using if statements and loops.
- ➢ This unit covers the concept of Arrays.
- ➢ This unit covers the concept of Functions.
- ➢ To understand the concept of implementing pointers

UNIT – I Overview of C	**6**

Overview of C: Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, datatypes, declaration of variables, Assigning values to variables ---Assignment statement, declaring a variable as constant, as volatile. Operators and Expression.

UNIT - II Decision Making and Branching	**6**

Decision Making and Branching: Decision making with If, simple IF, IF-ELSE, nested IF-ELSE, ELSE-IF ladder, switch, GOTO statement. **Decision Making and Looping**: While, Do - While, For, Jumps in loops.

UNIT - III Arrays	**6**

Arrays: Declaration and accessing of one & two – dimensional arrays, initializing two –dimensional arrays, multi-dimensional arrays.

UNIT - IV Functions	**6**

Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays, call by value, call by reference, storage classes –character arrays and string functions.

UNIT - V Pointers	**6**

Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.

	Total Lecture Hours	**30**

BOOKS FOR STUDY:

➢ E.Balagurusamy, Programming in ANSIC, Fifth Edition, Tata McGraw Hill, 2010

BOOKS FOR REFERENCES:

➢ Byron Gottfried, Schaum's Outline Programming with C, Fourth Edition, Tata McGraw Hill,2018.
➢ Kernighanand Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998
➢ Yashavant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 2021

WEB RESOURCES:

❖ **https://codeforwin.org/**
❖ **https://www.geeksforgeeks.org/c-programming-language/**
❖ **http://en.cppreference.com/w/c**
❖ **http://learn-c.org/**
❖ **https://www.cprogramming.com/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✔	ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL	REGIONAL		NATIONAL		GLOBAL	✔
Changes Made in the Course	Percentage of Change		No Changes Made			New Course	✔

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Remember the program structure of C with its syntax and semantics.	K1 to K2
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files).	K1 to K2
CO3	Apply the programming principles learnt in real-time problems.	K1 to K2
CO4	Analyze the various methods of solving a problem and choose the best method.	K1 to K2
CO5	Code, debug and test the programs with appropriate test cases.	K1 to K2

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG   **M – MEDIUM**   **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	1	2	2	2	2	-
CO 2	2	2	2	2	-	2
CO 3	3	2	2	1	1	-
CO 4	3	2	2	1	-	1
CO 5	1	2	2	2	2	3
WEITAGE	7	10	10	8	5	6
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	47	67	67	53	33	40

LESSON PLAN:

UNIT	STRUCTURED PROGRAMMING IN C	HRS	PEDAGOGY
I	Overview of C: Importance of C, sample C program, C program structure, executing C program. Constants, Variables, and Data Types: Character set, C tokens, keywords and identifiers, constants, variables, data types, declaration of variables, Assigning values to variables, Assignment statement, declaring a variable as constant, as volatile. Operators and Expression.	6	Black Board/PPT
II	Decision Making and Branching: Decision making with If, simple IF, IF-ELSE, nested IF-ELSE, ELSE-IF ladder, switch, GOTO statement. Decision Making and Looping: While, Do-While, For, Jumps in loops.	6	Black Board/PPT
III	Arrays: Declaration and accessing of one & two- dimensional arrays, initializing two-dimensional arrays, multi-dimensional arrays.	6	Black Board/PPT
IV	Functions: The form of C functions, Return values and types, calling a function, categories of functions, Nested functions, Recursion, functions with arrays, call by value, call by reference, storage classes-character arrays and string functions.	6	Black Board/PPT
V	Pointers: definition, declaring and initializing pointers, accessing a variable through address and through pointer, pointer expressions, pointer increments and scale factor, pointers and arrays, pointers and functions, pointers and structures.	6	Black Board/PPT

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
			Section A	
			MCQs	
Internal	**Cos**	**K Level**	**No. of. Questions**	**K - Level**
CI AI	**CO1**	**K1 – K2**	25	**K1,K2**
	CO2	**K1 – K2**	25	**K1,K2**
CI AII	**CO3**	**K1 – K2**	25	**K1,K2**
	CO4	**K1 – K2**	25	**K1,K2**
Question Pattern CIA I & II		**No. of Questions to be asked**	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

			Section A (MCQs)	
S. No	**COs**	**K - Level**	**No. of Questions**	**K – Level**
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	OFFICE AUTOMATION			
Course Code	23UCANM11	**L**	**P**	**C**
Category	NON MAJOR ELECTIVE	2	-	2

COURSE OBJECTIVES:

➢ Understand the basics of computer systems and its components.
➢ Understand and apply the basic concepts of a word processing package.
➢ Understand and apply the basic concepts of electronic spread sheet software.
➢ Understand and apply the basic concepts of data base management system.
➢ Understand and create a presentation using Power Point tool.

UNIT – I Introductory concepts	6

Introductory concepts: Memory unit – CPU - Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS – UNIX - Windows. Introduction to Programming Languages.

UNIT - II Word Processing	6

Word Processing: Open, Save and close word document; Editing text tools, formatting, bullets; Spell Checker –Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing – Preview, options, merge.

UNIT - III Spreadsheets	6

Excel – opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying; Charts – creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.

UNIT - IV Database Concepts	6

The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing menu drive applications in query language (MS–Access).

UNIT - V Power point	6

Introduction to Power point - Features – Understanding slide type casting & viewing slides–creating slideshows. Applying special object – including objects & pictures – Slide transition – Animation effects, audio inclusion, timers.

Total Lecture Hours	30

BOOKS FOR STUDY:

➤ Peter Norton, Introduction to Computers – Tata McGraw Hill.

BOOKS FOR REFERENCES:

➤ Jennifer Ackerman Kettel, GuyHat-Davis, Curt Simmons, Microsoft 2003, Tata McGraw Hill.

WEB RESOURCES:

❖ **https://www.udemy.com/course/office-automation-certificate-course/**
❖ **https://www.javatpoint.com/automation-tools**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED		ENTREPRENEURSHIP		✓
Curriculum Relevance	LOCAL	REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course		✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.*

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Possess the knowledge on the basics of computers and its components.	**K1 to K2**
CO2	Gain knowledge on Creating Documents, spread sheet and presentation.	**K1 to K2**
CO3	Learn the concepts of Database and implement the Query In Database.	**K1 to K2**
CO4	Demonstrate the understanding of different automation tools.	**K1 to K2**
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.	**K1 to K2**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG	M – MEDIUM	L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	2	2	2	3	3	1
CO 2	3	1	2	3	3	3

CO 3	**3**	**2**	**1**	**2**	**1**	**3**
CO 4	**3**	**3**	**2**	**2**	**2**	**1**
CO 5	**2**	**2**	**1**	**3**	**1**	**3**
WEITAGE	**13**	**10**	**8**	**13**	**10**	**11**
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	**87**	**67**	**53**	**87**	**67**	**73**

LESSON PLAN:

UNIT	OFFICE AUTOMATION	HRS	PEDAGOGY
I	Introductory concepts**:** Memory unit – CPU - Input Devices: Key board, Mouse and Scanner. Output devices: Monitor, Printer. Introduction to Operating systems & its features: DOS – UNIX - Windows. Introduction to Programming Languages.	**6**	**Black Board/PPT**
II	Word Processing: Open, Save and close word document; Editing text tools, formatting, bullets; Spell Checker –Document formatting – Paragraph alignment, indentation, headers and footers, numbering; printing – Preview, options, merge.	**6**	**Black Board/PPT**
III	Excel – opening, entering text and data, formatting, navigating; Formulas – entering, handling and copying; Charts – creating, formatting and printing, analysis tables, preparation of financial statements, introduction to data analytics.	**6**	**Black Board/PPT**
IV	The concept of data base management system; Data field, records, and files, Sorting and indexing data; Searching records. Designing queries, and reports; Linking of data files; Understanding Programming environment in DBMS; Developing menu drive applications in query language (MS–Access).	**6**	**Black Board/PPT**
V	Introduction to Power point - Features – Understanding slide type casting & viewing slides–creating slideshows. Applying special object – including objects & pictures – Slide transition – Animation effects, audio inclusion, timers.	**6**	**Black Board/PPT**

			Section A	
Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
			MCQs	
Internal	**Cos**	**K Level**	**No. of. Questions**	**K - Level**
CI AI	**CO1**	**K1 – K2**	25	**K1,K2**
	CO2	**K1 – K2**	25	**K1,K2**
CI AII	**CO3**	**K1 – K2**	25	**K1,K2**
	CO4	**K1 – K2**	25	**K1,K2**
Question Pattern CIA I & II		**No. of Questions to be asked**	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	**100**
CIA II	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	**100**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	**COs**	**K - Level**	**Section A (MCQs)**	
			No. of Questions	**K – Level**
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

SECOND SEMESTER

Course Name	OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++			
Course Code	23UCACC21	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

➢ Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
➢ Understand dynamic memory management techniques using pointers, constructors, destructors, etc.
➢ Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
➢ Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
➢ Demonstrate the use of various OOPs concepts with the help of programs.

UNIT - I	Introduction to C++	15

Introduction to C++ - key concepts of Object - Oriented Programming – Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures: Decision Making and Statements: If..else, jump, goto, break, continue, Switch case statements - Loops in C++ : for, while, do - functions in C++ inline functions – Function Overloading.

UNIT - II	Classes and Objects	15

Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects – friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

UNIT - III	Operator Overloading	15

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT - IV	Pointers	15

Pointers – Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object –Binding, Polymorphism and Virtual Functions.

UNIT - V	Files	15

Files –File stream classes – file modes – Sequential Read /Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling- String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions.

	Total Lecture Hours	**75**

BOOKS FOR STUDY:

➢ E.Balagurusamy,Object-OrientedProgrammingwithC++,TMH2013,7thEdition.

BOOKS FOR REFERENCES:

➢ Ashok N Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson Education 2003.
➢ Maria Litvin & Gray Litvin, C++ for you, Vikas Publication, 2002.

WEB RESOURCES:

❖ **https://alison.com/course/introduction-to-c-plus-plus-programming**

Nature of Course	EMPLOYABILITY		✓	SKILL ORIENTED			ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL		✓
Changes Made in the Course	Percentage of Change			No Changes Made			New Course		✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Remember the program structure of C with its syntax and semantics.	**K1 to K4**
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers, and files).	**K1 to K4**
CO3	Apply the programming principles learned in real-time problems.	**K1 to K4**
CO4	Analyze the various methods of solving a problem and choose the best method.	**K1 to K4**
CO5	Code, debug, and test the programs with appropriate test cases.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG	M – MEDIUM	L - LOW

CO / PO MAPPING:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	2	1	-	-	1

CO 2	2	2	2	1	-	-
CO 3	3	1	1	-	1	-
CO 4	1	2	1	2	2	1
CO 5	3	2	1	2	3	2
WEITAGE	12	9	6	5	6	4
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	80	60	40	33	40	27

LESSON PLAN:

UNIT	OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++	HRS	PEDAGOGY
I	Introduction to C++ - key concepts of Object - Oriented Programming – Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures: Decision Making and Statements: If..else, jump, go to, break, continue, Switch case statements - Loops in C++ : for, while, do - functions in C++ inline functions – Function Overloading.	15	**Black Board/PPT**
II	Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects – friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.	15	**Black Board/PPT**
III	Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.	15	**Black Board/PPT**
IV	Pointers – Declaration – Pointer to Class, Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object –Binding, Polymorphism and Virtual Functions.	15	**Black Board/PPT**
V	Files –File stream classes – file modes – Sequential Read /Write operations – Binary and ASCII Files –Random Access Operation – Templates – Exception Handling- String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions.	15	**Black Board/PPT**

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of. Questions	K - Level		
CI AI	CO1	K1 – K4	2	K1,K2	2(K3)	2(K4)
	CO2	K1 – K4	2	K1,K2	2(K3)	2(K4)
CI AII	CO3	K1 – K4	2	K1,K2	2(K3)	2(K4)
	CO4	K1 – K4	2	K1,K2	2(K3)	2(K4)
Question Pattern CIA I & II	No. of Questions to be asked		4		4	4
	No. of Questions to be answered		4		2	2
	Marks for each question		1		5	8
	Total Marks for each section		4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1-K4	2	K1,K2	2 (K3)	2 (K4)
2	CO2	K1-K4	2	K1,K2	2 (K3)	2 (K4)
3	CO3	K1-K4	2	K1,K2	2 (K3)	2 (K4)
4	CO4	K1-K4	2	K1,K2	2 (K3)	2 (K4)
5	CO5	K1-K4	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40

(Figures in parenthesis denotes, questions should be asked with the given K level)

Distribution of Marks with K Level						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.57	3.57
K2	5			5	3.57	3.57
K3		50		50	35.72	35.72
K4			80	80	57.14	57.14
Marks	10	50	80	140	100	100

NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions		**PART – A**		**(10 x 1 = 10 Marks)**	
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		(5 x 5 = 25 Marks)
11. a)	**Unit - I**	**CO1**	**K3**	
		OR		
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K3**	
		OR		
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		(5 x 8 = 40 Marks)
16. a)	**Unit - I**	**CO1**	**K4**	
		OR		
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
		OR		
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	C++ PROGRAMMING LAB			
Course Code	23UCACP21	**L**	**P**	**C**
Category	CORE	-	5	5

COURSE OBJECTIVES:

➢ Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
➢ Understand dynamic memory management techniques using pointers, constructors, destructors, etc.
➢ Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
➢ Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
➢ Demonstrate the use of various OOPs concepts with the help of programs.

LAB EXERCISE	75

1. Write a C++ program to demonstrate function overloading, default arguments, and inline functions.
2. Write a C++ program to demonstrate classes and objects.
3. Write a C++ program to demonstrate the concept of passing objects to functions.
4. Write a C++ program to demonstrate friend functions.
5. Write a C++ program to demonstrate the concept of passing objects to functions.
6. Write a C++ program to demonstrate constructors and destructors.
7. Write a C++ program to demonstrate unary operator overloading.
8. Write a C++ program to demonstrate binary operator overloading.
9. Write a C++ program to demonstrate
   - Single inheritance.
   - Multilevel inheritance.
   - Multiple inheritance.
   - Hierarchical inheritance.
   - Hybrid inheritance.
10. Write a C++ program to demonstrate virtual functions.
11. Write a C++ program to manipulate a text file.
12. Write a C++ program to perform sequential I/O operations on a file.
13. Write a C++ program to find the biggest number using command-line arguments.
14. Write a C++ program to demonstrate class templates.
15. Write a C++ program to demonstrate function templates.
16. Write a C++ program to demonstrate exception handling.

	Total Lecture Hours	75

BOOKS FOR STUDY:

➤ E.Balagurusamy, Object-Oriented Programming with C++, TMH 2013, 7th Edition.

BOOKS FOR REFERENCES:

➤ Ashok N Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson Education 2003.
➤ Maria Litvin & Gray Litvin, C++ for you, Vikas Publication 2002.

WEB RESOURCES:

❖ **https://alison.com/course/introduction-to-c-plus-plus-programming**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL	REGIONAL	NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓
*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.						

COURSE OUTCOMES:	K LEVEL
After studying this course, the students will be able to:	
CO1 Remember the program structure of C with its syntax and semantics.	**K1 to K4**
CO2 Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers, and files).	**K1 to K4**
CO3 Apply the programming principles learned in real-time problems.	**K1 to K4**
CO4 Analyze the various methods of solving a problem and choose the best method.	**K1 to K4**
CO5 Code, debug, and test the programs with appropriate test cases.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG   M – MEDIUM   L – LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	1	2
CO 2	2	3	3	3	1	2

CO 3	2	3	3	3	1	2
CO 4	2	3	3	3	1	2
CO 5	2	3	3	3	1	2
WEITAGE	11	15	15	15	5	10
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	73	100	100	100	33	67

LESSON PLAN:			
UNIT	**C++ Programming Lab**	**HRS**	**PEDAGOGY**
I	1. Write a C++ program to demonstrate function overloading, default arguments, and inline functions. 2. Write a C++ program to demonstrate classes and objects. 3. Write a C++ program to demonstrate the concept of passing objects to functions. 4. Write a C++ program to demonstrate friend functions.	15	Demonstration
II	1. Write a C++ program to demonstrate the concept of passing objects to functions. 2. Write a C++ program to demonstrate constructors and destructors. 3. Write a C++ program to demonstrate unary operator overloading.	15	Hands-on Training
III	1. Write a C++ program to demonstrate binary operator overloading. 2. Write a C++ program to demonstrate a. Single inheritance. b. Multilevel inheritance. c. Multiple inheritance. d. Hierarchical inheritance. e. Hybrid inheritance. 3. Write a C++ program to demonstrate virtual functions.	15	Hands-on Training
IV	1. Write a C++ program to manipulate a text file. 2. Write a C++ program to perform sequential I/O operations on a file. 3. Write a C++ program to find the biggest number using command-line arguments.	15	Demonstration
V	1. Write a C++ program to demonstrate class templates. 2. Write a C++ program to demonstrate function templates. 3. Write a C++ program to demonstrate exception handling.	15	Hands-on Training

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
Internal	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	2.5	2.5	2.5	2.5	2.5
		Total Marks for each section	5	5	5	5	5

Distribution of Marks with K Level CIA									
	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

				Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)							
S. No.	**Cos**	**K Level**	**Syntax & Semantics**	**Programming principles**	**Concept Applications**	**Coding& Implementation**	**Debugging & Output**
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
Distribution of Marks with K Level								
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks						75	100	100

Course Name	INTRODUCTION TO DATA SCIENCE			
Course Code	23UCAEC21	**L**	**P**	**C**
Category	CORE ELECTIVE	4	-	3

COURSE OBJECTIVES:

➢ To learn about the basics of Data Science and Big Data.
➢ To learn about the overview and building process of Data Science.
➢ To learn about various algorithms in Data Science.
➢ To learn about the Hadoop framework.
➢ To learn about a case study about Data Science.

UNIT – I	Basics of Data Science	12

Introduction: Benefits and uses – Facts of data – Data science process – Big data ecosystem and data science.

UNIT - II	Data Science Process	12

The Data science process: Overview – research goals – retrieving data - transformation – Exploratory Data Analysis – Model building.

UNIT - III	Algorithms	12

Algorithms: Machine learning algorithms – Modeling process – Types – Supervised – Unsupervised – Semi-supervised.

UNIT - IV	Hadoop	12

Introduction to Hadoop: Hadoop framework – Spark – replacing MapReduce – NoSQL – ACID – CAP – BASE – types.

UNIT – V	Case Study	12

Case Study: Prediction of Disease - Setting research goals - Data retrieval – preparation - exploration - Disease profiling - presentation and automation.

	Total Lecture Hours	60

BOOKS FOR STUDY:

➢ Davy Cielen, Arno D.B. Meysman, Mohamed Ali, 'Introducing Data Science', Manning Publications, 2016.

BOOKS FOR REFERENCES:

➢ Roger Peng, "The Art of Data Science," Lulu.com, 2016.
➢ Murtaza Haider, "Getting Started with Data Science – Making Sense of Data with Analytics," IBM Press, E-book.
➢ Davy Cielen, Arno D.B. Meysman, Mohamed Ali, "Introducing Data Science: Big Data, Machine Learning, and More, Using Python Tools," Dreamtech Press, 2016.
➢ Annalyn Ng, Kenneth Soo, "Numsense! Data Science for the Layman: No Math Added," 2017, 1st Edition.
➢ Cathy O'Neil, Rachel Schutt, "Doing Data Science: Straight Talk from the Frontline," O'Reilly Media, 2013.
➢ Lillian Pierson, "Data Science for Dummies," 2017, 2nd Edition.

WEB RESOURCES:

❖ **https://www.w3schools.com/datascience/**
❖ **https://en.wikipedia.org/wiki/Data_science**
❖ **http://www.cmap.polytechnique.fr/~lepennec/en/post/references/refs/**

Nature of Course	EMPLOYABILITY	✓	SKILL ORIENTED		ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course		✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the basics in Data Science and Big Data.	**K1 to K4**
CO2	Understand the overview and building process in Data Science..	**K1 to K4**
CO3	Understand various algorithms in Data Science.	**K1 to K4**
CO4	Understand the Hadoop Framework in Data Science	**K1 to K4**
CO5	Case study in Data Science.	**K1 to K4**
MAPPING WITH PROGRAM OUTCOMES:		

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	M	M	M	M
CO2	S	S	M	M	L	M	M	M	M	M
CO3	M	M	M	S	M	S	L	M	M	L

CO4	M	M	M	S	S	S	M	L	M	M
CO5	M	M	S	M	M	L	M	S	M	M

S- STRONG			**M – MEDIUM**				**L - LOW**			

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	2	1	2	2
CO 2	2	3	2	2	-
CO 3	3	2	2	1	1
CO 4	1	2	2	1	3
CO 5	2	2	-	3	1
WEITAGE	11	11	7	9	7
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	73	73	47	60	47

LESSON PLAN:

UNIT	Introduction to Data Science	HRS	PEDAGOGY
I	Introduction: Benefits and uses – Facts of data – Data science process – Big data ecosystem and data science.	12	**Black Board/PPT**
II	The Data science process: Overview – research goals – retrieving data - transformation – Exploratory Data Analysis – Model building.	12	**Black Board/PPT**
III	Algorithms: Machine learning algorithms – Modeling process – Types – Supervised – Unsupervised – Semi-supervised.	12	**Black Board/PPT**
IV	Introduction to Hadoop: Hadoop framework – Spark – replacing MapReduce – NoSQL – ACID – CAP – BASE – types.	12	**Black Board/PPT**
V	Case Study: Prediction of Disease - Setting research goals - Data retrieval – preparation - exploration - Disease profiling - presentation and automation.	12	**Black Board/PPT**

<table>
<tr><td colspan="8" align="center">Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)</td></tr>
<tr><td rowspan="3">Internal</td><td rowspan="3">Cos</td><td rowspan="3">K Level</td><td colspan="2">Section A</td><td rowspan="2">Section B
Either or
Choice</td><td rowspan="2">Section C
Either or Choice</td></tr>
<tr><td colspan="2">MCQs</td></tr>
<tr><td>No. of.
Questions</td><td>K -
Level</td></tr>
<tr><td rowspan="2">CI
AI</td><td>CO1</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td>CO2</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td rowspan="2">CI
AII</td><td>CO3</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td>CO4</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td rowspan="4">Question
Pattern
CIA I & II</td><td colspan="2">No. of Questions to
be asked</td><td>4</td><td></td><td>4</td><td>4</td></tr>
<tr><td colspan="2">No. of Questions to
be answered</td><td>4</td><td></td><td>2</td><td>2</td></tr>
<tr><td colspan="2">Marks for each
question</td><td>1</td><td></td><td>5</td><td>8</td></tr>
<tr><td colspan="2">Total Marks for
each section</td><td>4</td><td></td><td>10</td><td>16</td></tr>
</table>

<table>
<tr><td colspan="8" align="center">Distribution of Marks with K Level CIA I & CIA II</td></tr>
<tr><td></td><td>K
Level</td><td>Section A
(Multiple
Choice
Questions)</td><td>Section B
(Either /
Or Choice)</td><td>Section C
(Either /
Or Choice)</td><td>Total
Marks</td><td>% of (Marks
without choice)</td><td>Consolidate of %</td></tr>
<tr><td rowspan="5">CIA
I</td><td>K1</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td><td rowspan="2">7.2</td></tr>
<tr><td>K2</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td></tr>
<tr><td>K3</td><td></td><td>20</td><td></td><td>20</td><td>35.7</td><td>35.7</td></tr>
<tr><td>K4</td><td></td><td></td><td>32</td><td>32</td><td>57.1</td><td>57.1</td></tr>
<tr><td>Marks</td><td>4</td><td>20</td><td>32</td><td>56</td><td>100</td><td>100</td></tr>
<tr><td rowspan="5">CIA
II</td><td>K1</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td><td rowspan="2">7.2</td></tr>
<tr><td>K2</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td></tr>
<tr><td>K3</td><td></td><td>20</td><td></td><td>20</td><td>35.7</td><td>35.7</td></tr>
<tr><td>K4</td><td></td><td></td><td>32</td><td>32</td><td>57.1</td><td>57.1</td></tr>
<tr><td>Marks</td><td>4</td><td>20</td><td>32</td><td>56</td><td>100</td><td>100</td></tr>
</table>

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1-K4	2	K1,K2	2 (K3)	2 (K4)
2	CO2	K1-K4	2	K1,K2	2 (K3)	2 (K4)
3	CO3	K1-K4	2	K1,K2	2 (K3)	2 (K4)
4	CO4	K1-K4	2	K1,K2	2 (K3)	2 (K4)
5	CO5	K1-K4	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.57	3.57
K2	5			5	3.57	3.57
K3		50		50	35.72	35.72
K4			80	80	57.14	57.14
Marks	10	50	80	140	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions		**PART – A**		**(10 x 1 = 10 Marks)**	
	Unit - I	**CO1**	**K1**		
1.				a)	b)
				c)	d)
	Unit - I	**CO1**	**K2**		
2.				a)	b)
				c)	d)
	Unit - II	**CO2**	**K1**		
3.				a)	b)
				c)	d)
	Unit - II	**CO2**	**K2**		
4.				a)	b)
				c)	d)
	Unit - III	**CO3**	**K1**		
5.				a)	b)
				c)	d)
	Unit - III	**CO3**	**K2**		
6.				a)	b)
				c)	d)
	Unit - IV	**CO4**	**K1**		
7.				a)	b)
				c)	d)
	Unit - IV	**CO4**	**K2**		
8.				a)	b)
				c)	d)
	Unit - V	**CO5**	**K1**		
9.				a)	b)
				c)	d)
	Unit - V	**CO5**	**K2**		
10.				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		(5 x 5 = 25 Marks)
11. a)	**Unit - I**	**CO1**	**K3**	
		OR		
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR		
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K3**	
		OR		
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR		
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR		
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		(5 x 8 = 40 Marks)
16. a)	**Unit - I**	**CO1**	**K4**	
		OR		
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR		
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
		OR		
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR		
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR		
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	UNDERSTANDING INTERNET			
Course Code	23UCANM21	**L**	**P**	**C**
Category	NME	2	-	2

COURSE OBJECTIVES:

- ➢ Knowledge of Internet medium.
- ➢ Internet as a mass medium.
- ➢ Features of Internet Technology.
- ➢ Internet as source of infotainment.
- ➢ Study of internet audiences and about cyber-crime.

UNIT - I	Emergence of Internet	06

The emergence of internet as a mass medium – the world of world wide web.

UNIT - II	Features of Internet	06

Features of internet as a technology.

UNIT - III	Classification	06

Internet as a source of infotainment – classification based on content and style.

UNIT - IV	Effect of Internet	06

Demographic and psychographic descriptions of internet-audiences – effect of internet on the values and life - styles.

UNIT - V	Issues and Possibilities	06

Present issues such as cyber-crime and future possibilities.

	Total Lecture Hours	30

BOOKS FOR STUDY:

➢ Barnouw.E and Krishnaswamy S [1990], Indian Film, New York, OUP.
➢ Kumar, Keval [1999] Mass Communication in India. Mumbai, Jaico.
➢ Srivastava, KM [1992] Media Issues. Sterling Publishers Pvt Ltd.

BOOKS FOR REFERENCES:

➢ Acharya, RN [1987] Television in India. Manas Publications, New Delhi.
➢ Barnouw, E [1974] Documentary – A History of Non-fiction. Oxford, OUP
➢ Luthra, HR [1986] Indian Broadcasting. Ministry of I & B, New Delhi.
➢ Vasudev, Aruna [1986] The New Indian Cinema. Macmillan India, New Delhi.

WEB RESOURCES:

❖ https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf
❖ https://www.w3schools.com/html/default.asp

Nature of Course	EMPLOYABILITY		SKILL ORIENTED		ENTREPRENEURSHIP		✓
Curriculum Relevance	LOCAL	REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course		✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Knows the basic concept in internet Concept of mass medium and world wide web.	K1 to K2
CO2	Knows the concept of internet as a technology.	K1 to K2
CO3	Understand the concept of infotainment and classification based on content And style.	K1 to K2
CO4	Can be able to know about Demographic and psychographic description of Internet.	K1 to K2
CO5	Understand the concept of cyber-crime and future possibilities.	K1 to K2

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	S	M	M	M	M
CO2	S	S	S	S	S	S	M	M	M	M
CO3	S	S	S	S	S	S	M	M	M	M
CO4	S	S	S	S	S	S	M	M	M	M
CO5	S	S	S	S	S	S	M	M	M	M

S- STRONG   M – MEDIUM   L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	3	3
CO 2	3	3	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
WEITAGE	14	15	14	14	15	15
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	93	100	93	93	100	100

LESSON PLAN:

UNIT	UNDERSTANDING INTERNET	HRS	PEDAGOGY
I	The emergence of internet as a mass medium – the world of world wide web.	6	Black Board/PPT
II	Features of internet as a technology.	6	Black Board/PPT
III	Internet as a source of infotainment – classification based on content and style.	6	Black Board/PPT
IV	Demographic and psychographic descriptions of internet-audiences – effect of internet on the values and life - styles.	6	Black Board/PPT
V	Present issues such as cyber-crime and future possibilities.	6	Black Board/PPT

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
			Section A	
Internal	**Cos**	**K Level**	**MCQs**	
			No. of. Questions	**K - Level**
CI AI	**CO1**	**K1 – K2**	25	**K1,K2**
	CO2	**K1 – K2**	25	**K1,K2**
CI AII	**CO3**	**K1 – K2**	25	**K1,K2**
	CO4	**K1 – K2**	25	**K1,K2**
Question Pattern CIA I & II		**No. of Questions to be asked**	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

			Section A (MCQs)	
Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	**COs**	**K - Level**	**No. of Questions**	**K – Level**
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

Course Name	ADVANCED EXCEL LAB			
Course Code	23UCASP21	**L**	**P**	**C**
Category	SKILL ENHANCEMENT	2	-	2

COURSE OBJECTIVES:

➢ Handle large amounts of data
➢ Aggregate numeric data and summarize into categories and subcategories
➢ Filtering, sorting, and grouping data or subsets of data
➢ Create pivot tables to consolidate data from multiple files
➢ Presenting data in the form of charts and graphs

S. No	List of Programs	Hours
1	Use Excel functions like SUM, AVERAGE, MAX, and MIN to calculate totals, averages, and other basic statistics.	
2	Set up data validation rules to control data input and prevent errors in your spreadsheet.	
3	Create simple bar charts, line charts, and pie charts to visualize data trends.	
4	Filter and Sort data to quickly find information in large datasets.	
5	Write basic IF statements to perform conditional calculations in your spreadsheet.	
6	Create data tables to perform sensitivity analysis or to display multiple scenarios of a calculation.	
7	Practice text functions like CONCATENATE, LEFT, RIGHT, and TRIM to clean and manipulate text data.	
8	Use functions like VLOOKUP and HLOOKUP to search for and retrieve specific data from a table.	
9		
10	Build a PivotTable to summarize and analyze data from a large dataset.	
11	Apply conditional formatting rules to highlight specific data based on certain criteria.	
12	Use Subtotal function to group and summarize data in a list.	
	Use date and time functions to calculate dates, durations and time differences	
	Total Lecture Hours	**30**

BOOKS FOR STUDY:

➢ M Alexander ,Microsoft Excel 365 BIBLE,2022,Wiley

BOOKS FOR REFERENCES:

➢ Wanyne. L. Winston, Market Analytics Data Driven Technique with Microsoft Excel,2014
➢ PunitPrabhu, Data Analytics with Excel,2019
➢ Manisha Nigam, Advanced Analytics with Excel, 2019, BPB Publications

WEB RESOURCES:

❖ **https://www.coursera.org/learn/excel-data-analysis**
❖ **https://www.udemy.com/course/data-analytics-in-excel/**

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Remember the syntax and semantics.	K1 to K4
CO2	Understand the programming principles.	K1 to K4
CO3	Apply the principles learned in real-time problems.	K1 to K4
CO4	Analyze the various methods of solving a problem and choose the best method.	K1 to K4
CO5	Code, debug, and test the programs with appropriate test cases.	K1 to K4

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG   M – MEDIUM   L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	2	3	2	2	2
CO 2	3	3	3	2	3	2
CO 3	3	2	2	3	3	3
CO 4	3	2	3	3	3	3
CO 5	3	3	2	3	3	3
WEITAGE	15	12	14	13	14	13
WEIGHTED PERCENTAGE	100%	80%	93%	100%	93%	86%

S. No	List of contents	HRS	PEDAGOGY
	OF COURSE CONTRIBUTION TO POS		
1	Use Excel functions like SUM, AVERAGE, MAX, and MIN to calculate totals, averages, and other basic statistics.		
2	Set up data validation rules to control data input and prevent errors in your spreadsheet.		
3	Create simple bar charts, line charts, and pie charts to visualize data trends.		
4	Filter and Sort data to quickly find information in large datasets.		
5	Write basic IF statements to perform conditional calculations in your spreadsheet.		
6	Create data tables to perform sensitivity analysis or to display multiple scenarios of a calculation.	**30**	**Demonstration Hands-on Training**
7	Practice text functions like CONCATENATE, LEFT, RIGHT, and TRIM to clean and manipulate text data.		
8	Use functions like VLOOKUP and HLOOKUP to search for and retrieve specific data from a table.		
9	Build a PivotTable to summarize and analyze data from a large dataset.		
10	Apply conditional formatting rules to highlight specific data based on certain criteria.		
11	Use Subtotal function to group and summarize data in a list.		
12	Use date and time functions to calculate dates, durations and time differences		

Internal	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	2.5	2.5	2.5	2.5	2.5
		Total Marks for each section	5	5	5	5	5

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

Distribution of Marks with K Level CIA

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

		Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)					
S. No.	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level								
K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks						75	100	100

BCA

Syllabus

Program Code: UCA

2023 - Onwards

MANNAR THIRUMALAI NAICKER COLLEGE

(AUTONOMOUS)

Re-accredited with "A" Grade by NAAC

PASUMALAI, MADURAI – 625 004

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS), MADURAI – 625 004
BACHELOR OF COMPUTER APPLICATIONS CURRICULUM
(For the students admitted from the academic year 2023-2024 onwards)

Course Code	Title of the Course	Hrs	Credits	Maximum Marks		
				Int	Ext	Total
THIRD SEMESTER						
Part – I	**Tamil / Alternative course**					
23UTAGT31 / 23UHIGH31	தமிழக வரலாறும் பண்பாடும் / PATRA LEKHAN AUR PARIBHASHIK SHABDAVALI	6	3	25	75	100
Part – II	**English**					
23UENGE31	GENERAL ENGLISH - III	6	3	25	75	100
Part - III	**Core courses**					
23UCACC31	DATA STRUCTURES AND ALGORITHMS	5	5	25	75	100
23UCACP31	DATA STRUCTURES AND ALGORITHMS LAB	5	5	25	75	100
Part - III	**Elective course**					
23UMTEA31	STATISTICAL METHODS AND ITS APPLICATION	4	3	25	75	100
Part - IV	**Skill Based courses**					
23UCASC31	MULTIMEDIA SYSTEMS	1	1	25	75	100
23UCASP31	INTRODUCTION TO HTML LAB	2	2	25	75	100
Part - IV	**Mandatory course**					
23UEVSG41	ENVIRONMENTAL STUDIES	1	-	-	-	-
	Total	**30**	**22**	**175**	**525**	**700**
FOURTH SEMESTER						
Part – I	**Tamil / Alternative course**					
23UTAGT41 / 23UHIGH41	தமிழும் அறிவியலும் / HINDI BHASHA AUR COMPUTER	6	3	25	75	100
Part – II	**English**					
23UENGE41	GENERAL ENGLISH - IV	6	3	25	75	100
Part - III	**Core courses**					
23UCACC41	PROGRAMMING IN JAVA	5	5	25	75	100
23UCACP41	PROGRAMMING IN JAVA LAB	5	5	25	75	100
Part - III	**Elective course**					
23UCAEC41	DATABASE MANAGEMENT SYSTEM	3	3	25	75	100
Part - IV	**Skill Based courses**					
23UCASC41	BIOMETRICS	2	2	25	75	100
23UCASP41	PHP PROGRAMMING LAB	2	2	25	75	100
Part - IV	**Mandatory course**					
23UEVSG41	ENVIRONMENTAL STUDIES	1	2	25	75	100
	Total	**30**	**25**	**200**	**600**	**800**

THIRD SEMESTER

Course Name	DATA STRUCTURES AND ALGORITHMS			
Course Code	23UCACC31	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

➢ To understand the concepts of ADTs
➢ To learn linear data structures - lists, stacks, queues
➢ To learn tree structures and application of trees
➢ To learn graph structures and application of graphs
➢ To understand various sorting and searching

UNIT – I Abstract Data Types (ADTs)	15

Abstract Data Types (ADTs) - List ADT - Array-based implementation - Linked List implementation - Singly linked lists - Circular linked lists - Doubly-linked lists - Applications of lists - Polynomial Manipulation - All operations - Insertion - Deletion - Merge - Traversal

UNIT - II Stack and Queue	15

Stack ADT - Operations - Applications - Evaluating arithmetic expressions - Conversion of infix to postfix expression - Queue ADT - Operations - Circular Queue – Priority Queue - deQueue - Applications of queues.

UNIT - III Trees	15

Tree ADT - Tree traversals –Binary Tree ADT - Expression trees - Applications of trees - Binary search tree ADT - Threaded Binary Trees - AVL Trees - B-Tree - B+ Tree - Heap - Applications of heap.

UNIT - IV Graph	15

Definition - Representation of Graph - Types of graph - Breadth first traversal - Depth first traversal - Applications of graphs.

UNIT - V Searching and Sorting	15

Searching - Linear search - Binary search - Sorting - Bubble sort - Selection sort - Insertion sort - Hashing - Hash functions - Separate chaining - Open Addressing - Rehashing - Extensible Hashing

	Total Lecture Hours	75

BOOKS FOR STUDY:

➤ Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education2014, 4th Edition.

➤ Reema Thareja, Data Structures Using C, Oxford Universities Press 2014, 2ndEdition

BOOKS FOR REFERENCES:

➤ Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.

➤ Aho, Hopcroft, and Ullman, "Data Structures and Algorithms", Pearson Education 2003.

WEB RESOURCES:

❖ **NPTEL & MOOC courses titled Data Structures**
❖ **https://nptel.ac.in/courses/106106127/**

Nature of Course	EMPLOYABILITY		✔	SKILL ORIENTED			ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL		✔
Changes Made in the Course	Percentage of Change			No Changes Made			New Course		✔

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.*

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.	**K1 to K4**
CO2	Understand basic data structures such as arrays, linked lists, stacks, and queues.	**K1 to K4**
CO3	Describe the hash function and concepts of collision and its resolution methods.	**K1 to K4**
CO4	Solve problems involving graphs, trees, and heaps.	**K1 to K4**
CO5	Apply algorithms for solving problems like sorting, searching, insertion, and deletion of data.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG	M – MEDIUM	L – LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	1	2	3
CO 2	1	2	1	2	2	1
CO 3	3	2	2	2	2	3
CO 4	2	2	2	2	2	2
CO 5	3	1	2	2	1	3
WEITAGE	12	10	10	9	9	12
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	80	67	67	60	60	80

LESSON PLAN:

UNIT	DATA STRUCTURES AND ALGORITHMS	HRS	PEDAGOGY
I	Abstract Data Types (ADTs) - List ADT - Array-based implementation - linked list implementation - singly linked lists - circular linked lists - doubly-linked lists - applications of lists - Polynomial Manipulation - All operations - Insertion - Deletion - Merge – Traversal	15	**Black Board/PPT**
II	Stack ADT - Operations - Applications - Evaluating arithmetic expressions - Conversion of infix to postfix expression - Queue ADT - Operations - Circular Queue – Priority Queue - deQueue - applications of queues.	15	**Black Board/PPT**
III	Tree ADT - tree traversals – Binary Tree ADT - expression trees - applications of trees - binary search tree ADT - Threaded Binary Trees - AVL Trees - B-Tree - B+Tree - Heap - Applications of heap.	15	**Black Board/PPT**
IV	Definition - Representation of Graph - Types of graph - Breadth first traversal - Depth first traversal - Topological sort - Bi-connectivity - Cut vertex - Euler circuits - Applications of graphs.	15	**Black Board/PPT**
V	Searching - Linear search - Binary search - Sorting - Bubble sort - Selection sort - Insertion sort - Shell sort - Radix sort - Hashing - Hash functions - Separate chaining - Open Addressing - Rehashing - Extensible Hashing	15	**Black Board/PPT**

			Section A		Section B	Section C
Internal	**Cos**	**K Level**	**MCQs**		**Either or Choice**	**Either or Choice**
			No. of. Questions	**K - Level**		
CI AI	**CO1**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
	CO2	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
CI AII	**CO3**	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
	CO4	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
Question Pattern CIA I & II		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

	K Level	**Section A (Multiple Choice Questions)**	**Section B (Either / Or Choice)**	**Section C (Either / Or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	2			2	**3.6**	**7.2**
	K2	2			2	**3.6**	
	K3		20		20	**35.7**	35.7
	K4			32	32	**57.1**	57.1
	Marks	**4**	**20**	**32**	**56**	**100**	**100**
CIA II	**K1**	2			2	**3.6**	**7.2**
	K2	2			2	**3.6**	
	K3		20		20	**35.7**	35.7
	K4			32	32	**57.1**	57.1
	Marks	**4**	**20**	**32**	**56**	**100**	**100**

Distribution of Marks with K Level CIA I & CIA II

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K - LEVEL
			No. of Questions	K – Level		
1	CO1	K1-K4	2	K1,K2	2 (K3)	2 (K4)
2	CO2	K1-K4	2	K1,K2	2 (K3)	2 (K4)
3	CO3	K1-K4	2	K1,K2	2 (K3)	2 (K4)
4	CO4	K1-K4	2	K1,K2	2 (K3)	2 (K4)
5	CO5	K1-K4	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5			5	3.57	3.57
K2	5			5	3.57	3.57
K3		50		50	35.72	35.72
K4			80	80	57.14	57.14
Marks	10	50	80	140	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level			
Answer **ALL** the questions		**PART – A**			**(10 x 1 = 10 Marks)**	
1.	**Unit - I**	**CO1**	**K1**			
				a)	b)	
				c)	d)	
2.	**Unit - I**	**CO1**	**K2**			
				a)	b)	
				c)	d)	
3.	**Unit - II**	**CO2**	**K1**			
				a)	b)	
				c)	d)	
4.	**Unit - II**	**CO2**	**K2**			
				a)	b)	
				c)	d)	
5.	**Unit - III**	**CO3**	**K1**			
				a)	b)	
				c)	d)	
6.	**Unit - III**	**CO3**	**K2**			
				a)	b)	
				c)	d)	
7.	**Unit - IV**	**CO4**	**K1**			
				a)	b)	
				c)	d)	
8.	**Unit - IV**	**CO4**	**K2**			
				a)	b)	
				c)	d)	
9.	**Unit - V**	**CO5**	**K1**			
				a)	b)	
				c)	d)	
10.	**Unit - V**	**CO5**	**K2**			
				a)	b)	
				c)	d)	

Answer **ALL** the questions		**PART – B**			**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K3**		
				OR	
11. b)	**Unit - I**	**CO1**	**K3**		
12. a)	**Unit - II**	**CO2**	**K3**		
				OR	
12. b)	**Unit - II**	**CO2**	**K3**		
13. a)	**Unit - III**	**CO3**	**K3**		
				OR	
13. b)	**Unit - III**	**CO3**	**K3**		
14. a)	**Unit - IV**	**CO4**	**K3**		
				OR	
14. b)	**Unit - IV**	**CO4**	**K3**		
15. a)	**Unit - V**	**CO5**	**K3**		
				OR	
15. b)	**Unit - V**	**CO5**	**K3**		

Answer **ALL** the questions		**PART – C**			**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K4**		
				OR	
16. b)	**Unit - I**	**CO1**	**K4**		
17. a)	**Unit - II**	**CO2**	**K4**		
				OR	
17. b)	**Unit - II**	**CO2**	**K4**		
18. a)	**Unit - III**	**CO3**	**K4**		
				OR	
18. b)	**Unit - III**	**CO3**	**K4**		
19. a)	**Unit - IV**	**CO4**	**K4**		
				OR	
19. b)	**Unit - IV**	**CO4**	**K4**		
20. a)	**Unit - V**	**CO5**	**K4**		
				OR	
20. b)	**Unit - V**	**CO5**	**K4**		

Course Name	DATA STRUCTURES AND ALGORITHMS LAB			
Course Code	23UCACP31	**L**	**P**	**C**
Category	CORE	-	5	5

COURSE OBJECTIVES

➢ To understand the concepts of ADTs
➢ To learn linear data structures - lists, stacks, queues
➢ To learn tree structures and application of trees
➢ To learn graph structures and application of graphs
➢ To understand various sorting and searching

S. No.	LAB EXERCISE	75

1. Write a program to implement the List ADT using arrays and linked lists.
2. Write a program to implement the following using a singly linked list.
   - Stack ADT
   - Queue ADT
3. Write a program that reads an infix expression, converts the expression to postfix form, and then evaluates the postfix expression (use stack ADT).
4. Write a program to implement priority queue ADT.
5. Write a program to perform the following operations:
   - Insert an element into a binary search tree.
   - Delete an element from a binary search tree.
   - Search for a key element in a binary search tree.
6. Write a program to perform the following operations:
   - Insertion into an AVL-tree
   - Deletion from an AVL-tree
7. Write a program for the implementation of BFS and DFS for a given graph.
8. Write a program for implementing the following searching methods:
   - Linear search
   - Binary search.
9. Write a program for implementing the following sorting methods:
   - Bubble sort
   - Selection sort
   - Insertion sort
   - Radix sort.

	Total Lecture Hours	75

BOOKS FOR STUDY:

➢ Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education 2014, 4th Edition.
➢ ReemaThareja, "Data Structures Using C", Oxford Universities Press 2014, 2nd Edition.

BOOKS FOR REFERENCES:

➢ Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.

WEB RESOURCES:

❖ **NPTEL&MOOCcoursestitledDataStructures**
❖ **https://nptel.ac.in/courses/106106127/**

Nature of Course	EMPLOYABILITY		✓	SKILL ORIENTED			ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL		GLOBAL		✓
Changes Made in the Course	Percentage of Change	**60**	No Changes Made			New Course			

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.	**K1 to K4**
CO2	Understand basic data structures such as arrays, linked lists, stacks, and queues.	**K1 to K4**
CO3	Describe the hash function and concepts of collision and its resolution methods.	**K1 to K4**
CO4	Solve problems involving graphs, trees, and heaps.	**K1 to K4**
CO5	Apply algorithms for solving problems like sorting, searching, insertion, and deletion of data.	**K1 to K4**
MAPPING WITH PROGRAM OUTCOMES:		

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	S	S	M	M	M	M	L
CO2	S	M	L	S	M	L	M	S	M	M
CO3	S	L	S	M	L	S	M	M	M	M
CO4	M	M	S	S	M	M	M	L	M	L
CO5	S	M	M	M	S	S	M	M	L	M
S- STRONG				**M – MEDIUM**				**L – LOW**		

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	2	3	3
CO 2	1	2	2	2	2	1
CO 3	3	2	2	2	2	3
CO 4	2	2	1	2	3	2
CO 5	3	2	2	2	2	3
WEITAGE	12	11	10	10	12	12
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	80	73	67	67	80	80

LESSON PLAN:

DATA STRUCTURES AND ALGORITHMS LAB

	LIST OF PROGRAMS	HRS	PEDAGOGY
1. 2. 3. 4. 5. 6. 7. 8. 9.	Write a program to implement the List ADT using arrays and linked lists. Write a program to implement the following using a singly linked list. • Stack ADT • Queue ADT Write a program that reads an infix expression, converts the expression to postfix form, and then evaluates the postfix expression (use stack ADT). Write a program to implement priority queue ADT. Write a program to perform the following operations: • Insert an element into a binary search tree. • Delete an element from a binary search tree. • Search for a key element in a binary search tree. Write a program to perform the following operations: • Insertion into an AVL-tree • Deletion from an AVL-tree Write a program for the implementation of BFS and DFS for a given graph. Write a program for implementing the following searching methods: • Linear search • Binary search. Write a program for implementing the following sorting methods: • Bubble sort • Selection sort • Insertion sort • Radix sort.	75	Demonstration Hands-on Training

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
Internal	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding & Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA	No. of Questions to be asked		2	2	2	2	2
	No. of Questions to be answered		2	2	2	2	2
	Marks for each question		2.5	2.5	2.5	2.5	2.5
	Total Marks for each section		5	5	5	5	5

Distribution of Marks with K Level CIA									
	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

S. No.	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level

K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	15	15	15	15	15	75	100	100

Course Name	STATISTICAL METHODS AND ITS APPLICATION			
Course Code	23UMTEA31	**L**	**P**	**C**
Category	ELECTIVE ALLIED	**4**	**-**	**3**

COURSE OBJECTIVES:

➢ To make understand the fundamentals of Statistics.
➢ Define the principal concepts about probability.
➢ To explain the Coefficient of Variation
➢ To understand the concept of Conditional Probability
➢ Explain the concept of a random variable and the probability distributions

UNIT – I Introduction to Statistics	12

Introduction to statistics – primary and secondary data – classification, tabulation and Diagrammatic Representation of statistical data – Bar-charts, Pie-diagrams" – Graphical Representation of data

UNIT - II Measures of Dispersion	12

Measures of dispersion – characteristics – coefficient of dispersion - Coefficient of variation – Moments – skewness and kurtosis – Pearson"s coefficient of skewness - Bowley"s coefficient of Skewness

UNIT - III Correlation , Regression	12

Simple correlation – Karl Pearson"s coefficient of correlation – correlation coefficient for A bivariate frequency distribution – Rank correlation – Regression – lines of regression

UNIT - IV Events and Sets	12

Events and sets – sample space – concept of probability – addition and multiplications Theorem on probability – conditional probability and independence of evens – Baye"s Theorem

UNIT - V Sampling Distributions	12

Concept of sampling distributions – standard error – Tests of significance based on t, Chi-square

	Total Lecture Hours	60

BOOKS FOR STUDY:

➢ Statistical Methods, S.P.Gupta, Sultan Chand and sons Publications,4th Edition 2011

BOOKS FOR REFERENCES:

➢ Statistics, Dr. S.Arumugam and A.ThangapandiIssac, New Gamma Publication house, 2002
➢ KishorS. Trivedi - Probability and statistics with reliability queuing and Computer Science Applications - Prentice Hall of India (P) Ltd., New Delhi -1997
➢ Discrete Mathematics - Seymour Lipschutz, Marc Lars Lipson Schaum,,s Outlines- by, 3rd Edition., Tata McGraw Hill, Education Pvt. Ltd., New Delhi. 5th Reprint, 2012

WEB RESOURCES:

❖ **Web resources from NDL Library, E-content from open-source libraries**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL	REGIONAL	NATIONAL	✓	GLOBAL	
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Summarize the concepts of statistical methods	**K1 to K4**
CO2	Analyse the different Statistical measures of data	**K1 to K4**
CO3	Derive the marginal and conditional distributions of random variables, translate realworld problems into probability models	**K1 to K4**
CO4	To understanding the concepts of Probability of an event	**K1 to K4**
CO5	Understand basic probability axioms and rules and the moments of discrete and continuous random variables as well as be familiar with common named discrete and continuous random variables	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG	M – MEDIUM	L – LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	2	3	3
CO 3	2	3	3	3	3	2
CO 4	3	3	3	3	2	3
CO 5	3	3	2	3	3	3
WEITAGE	14	15	14	14	14	14
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	93	100	93	93	93	93

LESSON PLAN:

UNIT	STATISTICAL METHODS AND ITS APPLICATION	HRS	PEDAGOGY
I	Introduction to statistics – primary and secondary data – classification, tabulation and Diagrammatic Representation of statistical data – Bar-charts, Pie-diagrams" – Graphical Representation of data	12	LCD
II	Measures of dispersion – characteristics – coefficient of dispersion - Coefficient of variation – Moments – skewness and kurtosis – Pearson"s coefficient of skewness - Bowley"s coefficient of Skewness	12	LCD
III	Simple correlation – Karl Pearson"s coefficient of correlation – correlation coefficient for A bivariate frequency distribution – Rank correlation – Regression – lines of regression	12	LCD
IV	Events and sets – sample space – concept of probability – addition and multiplications Theorem on probability – conditional probability and independence of evens – Baye"s Theorem	12	LCD
V	Concept of sampling distributions – standard error – Tests of significance basedont, Chi-square	12	LCD

<table>
<tr><th colspan="8">Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)</th></tr>
<tr><th rowspan="3">Internal</th><th rowspan="3">Cos</th><th rowspan="3">K Level</th><th colspan="2">Section A</th><th rowspan="3">Section B
Either or Choice</th><th rowspan="3">Section C
Either or Choice</th></tr>
<tr><th colspan="2">MCQs</th></tr>
<tr><th>No. of. Questions</th><th>K - Level</th></tr>
<tr><td>CI
AI</td><td>CO1</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td></td><td>CO2</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td>CI
AII</td><td>CO3</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td></td><td>CO4</td><td>K1 – K4</td><td>2</td><td>K1,K2</td><td>2(K3)</td><td>2(K4)</td></tr>
<tr><td rowspan="4" colspan="2">Question Pattern CIA I & II</td><td>No. of Questions to be asked</td><td>4</td><td></td><td>4</td><td>4</td></tr>
<tr><td>No. of Questions to be answered</td><td>4</td><td></td><td>2</td><td>2</td></tr>
<tr><td>Marks for each question</td><td>1</td><td></td><td>5</td><td>8</td></tr>
<tr><td>Total Marks for each section</td><td>4</td><td></td><td>10</td><td>16</td></tr>
</table>

<table>
<tr><th colspan="8">Distribution of Marks with K Level CIA I & CIA II</th></tr>
<tr><th></th><th>K Level</th><th>Section A (Multiple Choice Questions)</th><th>Section B (Either / Or Choice)</th><th>Section C (Either / Or Choice)</th><th>Total Marks</th><th>% of (Marks without choice)</th><th>Consolidate of %</th></tr>
<tr><td rowspan="5">CIA I</td><td>K1</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td><td rowspan="2">7.2</td></tr>
<tr><td>K2</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td></tr>
<tr><td>K3</td><td></td><td>20</td><td></td><td>20</td><td>35.7</td><td>35.7</td></tr>
<tr><td>K4</td><td></td><td></td><td>32</td><td>32</td><td>57.1</td><td>57.1</td></tr>
<tr><td>Marks</td><td>4</td><td>20</td><td>32</td><td>56</td><td>100</td><td>100</td></tr>
<tr><td rowspan="5">CIA II</td><td>K1</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td><td rowspan="2">7.2</td></tr>
<tr><td>K2</td><td>2</td><td></td><td></td><td>2</td><td>3.6</td></tr>
<tr><td>K3</td><td></td><td>20</td><td></td><td>20</td><td>35.7</td><td>35.7</td></tr>
<tr><td>K4</td><td></td><td></td><td>32</td><td>32</td><td>57.1</td><td>57.1</td></tr>
<tr><td>Marks</td><td>4</td><td>20</td><td>32</td><td>56</td><td>100</td><td>100</td></tr>
</table>

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	**COs**	**K - Level**	**Section A (MCQs)**		**Section B (Either / or Choice) With K - LEVEL**	**Section C (Either / or Choice) With K - LEVEL**
			No. of Questions	**K – Level**		
1	CO1	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
2	CO2	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
3	CO3	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
4	CO4	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
5	CO5	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	5			5	**3.57**	3.57
K2	5			5	**3.57**	3.57
K3		50		50	**35.72**	35.72
K4			80	80	**57.14**	57.14
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions		**PART – A**		**(10 x 1 = 10 Marks)**	
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

				Answer **ALL** the questions **PART – B** **(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K3**	
				OR
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
				OR
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K3**	
				OR
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
				OR
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
				OR
15. b)	**Unit - V**	**CO5**	**K3**	

				Answer **ALL** the questions **PART – C** **(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K4**	
				OR
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
				OR
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
				OR
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
				OR
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
				OR
20. b)	**Unit - V**	**CO5**	**K4**	

Course Name	MULTIMEDIA SYSTEMS			
Course Code	23UCASC31	**L**	**P**	**C**
Category	SKILLED	1	-	1

COURSE OBJECTIVES:

- ➢ Understand the definition of Multimedia.
- ➢ To study about the Image File Formats, Sounds Audio File Formats.
- ➢ Understand the concepts of Animation and Digital Video Containers.
- ➢ To study about the Stage of Multimedia Project.
- ➢ Understand the concept of Ownership of Content Created for Project Acquiring Talent.

UNIT – I Multimedia	3

Multimedia Definition - Multimedia - Computers and Text Font Editing and Design Tools - Hypermedia and Hypertext. Use of Multimedia - Delivering Multimedia - Text: About Fonts and Faces - Using Text

UNIT - II Images	3

Images: Plan Approach - Organize Tools - Configure Computer Workspace - Making Still Images - Color - Image File Formats. Sound: The Power of Sound - Digital Audio - Midi Audio - Midi vs. Digital Audio - Multimedia System Sounds - Audio File Formats - Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project.

UNIT - III Animation	3

Animation: The Power of Motion - Principles of Animation - Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video.

UNIT - IV Making Multimedia	3

Making Multimedia: The Stage of Multimedia Project - The Intangible Needs - The Hardware Needs - The Software Needs - An Authoring System's Needs - Multimedia Production Team.

UNIT - V Planning and Costing	3

Planning and Costing: The Process of Making Multimedia - Scheduling - Estimating - RFPs and Bid Proposals. Designing and Producing - Content and Talent: Acquiring Content - Ownership of Content Created for Project - Acquiring Talent.

	Total Lecture Hours	15

BOOKS FOR STUDY:

➢ Tay Vaughan, "Multimedia: Making It Work", 8th Edition, Osborne/McGraw-Hill, 2001.

BOOKS FOR REFERENCES:

➢ Ralf Steinmetz &KlaraNahrstedt, "Multimedia Computing, Communication & Applications", Pearson Education, 2012.

WEB RESOURCES:

❖ **https://www.geeksforgeeks.org/multimedia-systems-with-features-or-characteristics/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✔	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL		REGIONAL	NATIONAL	GLOBAL	✔
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✔

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the concepts, importance, application, and the process of developing multimedia.	**K1 & K2**
CO2	To have basic knowledge and understanding about image-related processing.	**K1 & K2**
CO3	To understand the framework of frames and bit images to animations.	**K1 & K2**
CO4	Speak about the multimedia projects and stages of requirements in phases of the project.	**K1 & K2**
CO5	Understanding the concept of cost involved in multimedia planning, designing, and producing.	**K1 & K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	L	M	M	M	M	M	M
CO2	S	S	M	M	M	M	M	L	M	M
CO3	M	L	M	S	L	S	M	M	M	M
CO4	M	M	M	S	S	S	L	M	M	L
CO5	L	M	S	M	M	M	M	S	M	M
S- STRONG				**M – MEDIUM**				**L - LOW**		

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	2	3	3	2	1
CO 2	3	2	3	3	2	1
CO 3	3	2	3	3	2	1
CO 4	3	2	3	3	1	1
CO 5	3	3	3	3	1	1
WEIGHTAGE	15	11	15	15	8	5
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	100	73	100	100	53	33

LESSON PLAN:

UNIT	MULTIMEDIA SYSTEMS	HRS	PEDAGOGY
I	**Multimedia** Definition - Multimedia - Computers and Text Font Editing and Design Tools - Hypermedia and Hypertext.Use Of Multimedia - Delivering Multimedia - Text: About Fonts and Faces - Using Text in	3	**Black Board/PPT**
II	**Images:** Plan Approach - Organize Tools - Configure Computer Workspace - Making Still Images - Color - Image File Formats. Sound: The Power of Sound - Digital Audio - Midi Audio - Midi vs. Digital Audio - Multimedia System Sounds - Audio File Formats - Vaughan's Law of Multimedia Minimums - Adding Sound to Multimedia Project.	3	**Black Board/PPT**
III	**Animation:** The Power of Motion - Principles of Animation - Animation by Computer - Making Animations that Work. Video: Using Video - Working with Video and Displays - Digital Video Containers - Obtaining Video Clips - Shooting and Editing Video.	3	**Black Board/PPT**
IV	**Making Multimedia:** The Stage of Multimedia Project - The Intangible Needs - The Hardware Needs - The Software Needs - An Authoring System's Needs - Multimedia Production Team.	3	**Black Board/PPT**
V	**Planning and Costing:** The Process of Making Multimedia - Scheduling - Estimating - RFPs and Bid Proposals. Designing and Producing - Content and Talent: Acquiring Content - Ownership of Content Created for Project - Acquiring Talent.	3	**Black Board/PPT**

			Section A	
Internal	**Cos**	**K Level**	**MCQs**	
			No. of. Questions	**K - Level**
CI	**CO1**	**K1 – K2**	25	**K1,K2**
AI	**CO2**	**K1 – K2**	25	**K1,K2**
CI	**CO3**	**K1 – K2**	25	**K1,K2**
AII	**CO4**	**K1 – K2**	25	**K1,K2**
Question Pattern CIA I & II		**No. of Questions to be asked**	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I^st Test-2 CO's & IInd Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
Distribution of Marks with K Level				
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	INTRODUCTION TO HTML LAB			
Course Code	23UCASP31	**L**	**P**	**C**
Category	SKILLED	**-**	**2**	**2**

COURSE OBJECTIVES

➤ Insert a graphic within a webpage.
➤ Create a link within a webpage.
➤ Create a table within a webpage
➤ Insert headings levels within a webpage.
➤ Insert ordered and unordered lists within a webpage

LAB EXERCISE	30

HTML

- Basic Html Tags
- Hyper Links, Tables & Multimedia
- Frames

CSS

- Inline, Internal and External Style sheets

JAVA SCRIPT

- Registration Form with Table
- String, Math & Date Object's predefined methods
- Calendar Creation
- Event Handling
- Validating Simple Form
- Multi-Validating Registration Form
- Background Color Change
- On Mouse over event

Total Lecture Hours	30

BOOKS FOR STUDY:

➢ "Mastering HTML5 and CSS3 Made Easy", TeachUComp Inc., 2014.

BOOKS FOR REFERENCES:

➢ Thomas Michaud, "Foundations of Web Design: Introduction to HTML & CSS"

WEB RESOURCES:

❖ **https://www.teachucomp.com/samples/html/5/manuals/Mastering-HTML5-CSS3.pdf**
❖ **https://www.w3schools.com/html/default.asp**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL		NATIONAL	GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course		✓

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Knows the basic concept in HTML. Concept of resources in HTML.	**K1 to K4**
CO2	Knows Design concept. Concept of Meta Data. Understand the concept of saving the files.	**K1 to K4**
CO3	Understand the page formatting, Concept of list.	**K1 to K4**
CO4	Creating Links, Know the concept of creating link to email address.	**K1 to K4**
CO5	Concept of adding images, Understand the table creation.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	S	M	M	M	L
CO2	S	S	S	S	S	S	M	M	M	M
CO3	S	S	S	S	S	S	M	M	M	M
CO4	S	S	S	S	S	S	M	L	M	L
CO5	S	S	S	S	S	S	M	M	L	M
S- STRONG			**M – MEDIUM**				**L – LOW**			

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	3	3
CO 2	3	3	2	3	3	3
CO 3	2	3	3	3	3	3
CO 4	3	3	3	3	3	3
CO 5	3	3	3	2	3	3
WEITAGE	14	15	14	14	15	15
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	93	100	93	93	100	100

LESSON PLAN:

INTRODUCTION TO HTML LAB		
LIST OF PROGRAMS	**HRS**	**PEDAGOGY**
HTML • Basic Html Tags • Hyper Links, Tables & Multimedia • Frames **CSS** • Inline, Internal and External Style sheets **JAVA SCRIPT** • Registration Form with Table • String, Math & Date Object's predefined methods • Calendar Creation • Event Handling • Validating Simple Form • Multi-Validating Registration Form • Background Color Change • OnMouseover event	30	**Demonstration Hands-on Training**

| Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs) | | | | | | | |
Internal	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding & Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA	No. of Questions to be asked		2	2	2	2	2
	No. of Questions to be answered		2	2	2	2	2
	Marks for each question		2.5	2.5	2.5	2.5	2.5
	Total Marks for each section		5	5	5	5	5

| Distribution of Marks with K Level CIA | | | | | | | | |
	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

S.No.	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level

K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	15	15	15	15	15	75	100	100

FOURTH SEMESTER

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

Course Name	PROGRAMMING IN JAVA			
Course Code	23UCACC41	**L**	**P**	**C**
Category	CORE	5	-	5

COURSE OBJECTIVES:

➤ To provide fundamental knowledge of object-oriented programming.
➤ To equip the student with programming knowledge in Core Java from the basic up.
➤ To enable the students to use AWT controls, Event Handling and Swing for GUI.
➤ To provide fundamental knowledge of object-oriented programming.
➤ To equip the student with programming knowledge in Core Java from the basic up.

UNIT – I Introduction and History of JAVA	15

Introduction: Review of Object-Oriented concepts - History of Java - Java buzzwords - JVM architecture - Data types - Variables - Scope and lifetime of variables - Arrays - Operators - Control statements - Type conversion and casting - Simple Java program - Constructors – Methods.

UNIT - II Inheritance , Packages, Interfaces & Exception Handling	15

Inheritance: Basic concepts - Types of inheritance - Member access rules - Usage of this and Super keyword - Method Overloading - Method overriding - Abstract classes - Dynamic method dispatch - Usage of final keyword.

Packages: Definition - Access Protection - Importing Packages.

Interfaces: Definition–Implementation–Extending interfaces.

Exception Handling: try - catch - throw - throws - finally - Built-in exceptions - Creating own Exception classes.

UNIT - III Multithreaded Programming& I/O Streams	15

Multithreaded Programming: Thread Class - Runnable interface – Synchronization – Using synchronized methods – Using synchronized statement - Interthread Communication – Deadlock.

I/O Streams: Concepts of streams - Stream classes - Byte and Character stream - Reading console Input and Writing Console output - File Handling.

UNIT - IV AWT Controls & Event Handling	15

AWT Controls: The AWT class hierarchy - user interface components - Labels - Button - Text Components - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Color - Fonts and layout managers.

Event Handling: Events - Event sources - Event Listeners - Event Delegation Model (EDM) - Handling Mouse and Keyboard Events

UNIT - V Swing	15

Introduction to Swing - Hierarchy of Swing Components - Containers - Top-level containers - JFrame - JWindow - JDialog - JPanel - JButton - JToggleButton - JCheckBox - JRadioButton - JLabel, JTextField - JTextArea - JList - JComboBox - JScrollPane.

	Total Lecture Hours	75

BOOKS FOR STUDY:

- ➢ Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010.
- ➢ Gary Cornell, Core Java 2 Volume I – Fundamentals, Addison Wesley, 1999.

BOOKS FOR REFERENCES:

- ➢ Head First Java, O'Reilly Publications,
- ➢ Y. Daniel Liang, Introduction to Java Programming, 7th Edition, Pearson Education India, 2010.

WEB RESOURCES:

- ❖ **https://javabeginnerstutorial.com/core-java-tutorial**
- ❖ **http://docs.oracle.com/javase/tutorial/**
- ❖ **https://www.coursera.org/**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED		ENTREPRENEURSHIP		✓
Curriculum Relevance	LOCAL	REGIONAL		NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	**30**	No Changes Made		New Course		

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the basic concepts of object-oriented programming and implement the fundamental constructs of Core Java.	**K1 & K2**
CO2	Implement inheritance, packages, interfaces, and exception handling in Core Java	**K1 & K2**
CO3	Implement multi-threading and I/O Streams in Core Java.	**K1 & K2**
CO4	Implement AWT (Abstract Window Toolkit) and event handling in Core Java	**K1 & K2**
CO5	Utilize Swing to create graphical user interfaces (GUIs).	**K1 & K2**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG	M – MEDIUM	L - LOW

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	2	1	2	2	
CO 2	3	1	2	1	2	
CO 3	1	2	2	2	2	
CO 4	2	2	2	2	2	
CO 5	1	2	2	2	2	
WEIGHTAGE	10	9	9	9	10	
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	67	60	60	60	67	

LESSON PLAN:

UNIT	PROGRAMMING IN JAVA	HRS	PEDAGOGY
I	Introduction: Review of Object-Oriented concepts - History of Java - Java buzzwords - JVM architecture - Data types - Variables - Scope and lifetime of variables - Arrays - Operators - Control statements - Type conversion and casting - Simple Java program - Constructors - Methods - Static block - Static Data - Static Method String and String Buffer Classes.	15	**Black Board/PPT**
II	Inheritance: Basic concepts - Types of inheritance - Member access rules - Usage of this and Super keyword - Method Overloading - Method overriding - Abstract classes - Dynamic method dispatch - Usage of final keyword. Packages: Definition - Access Protection - Importing Packages. Interfaces: Definition–Implementation–Extending interfaces. Exception Handling: try - catch - throw - throws - finally - Built-in exceptions - Creating own Exception classes.	15	**Black Board/PPT**
III	Multithreaded Programming: Thread Class - Runnable interface – Synchronization – Using synchronized methods – Using synchronized statement - Interthread Communication – Deadlock. I/O Streams: Concepts of streams - Stream classes - Byte and Character stream - Reading console Input and Writing Console output - File Handling.	15	**Black Board/PPT**
IV	AWT Controls: The AWT class hierarchy - user interface components - Labels - Button - Text Components - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Color - Fonts and layout managers. Event Handling: Events - Event sources - Event Listeners - Event Delegation Model (EDM) - Handling Mouse and Keyboard Events - Adapter classes - Inner classes.	15	**Black Board/PPT**
V	Introduction to Swing - Hierarchy of Swing Components - Containers -	15	**Black**

			Board/PPT
	Top-level containers - JFrame - JWindow - JDialog - JPanel - JButton - JToggleButton - JCheckBox - JRadioButton - JLabel, JTextField - JTextArea - JList - JComboBox - JScrollPane.		

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Section A MCQs		Section B Either or Choice	Section C Either or Choice
			No. of. Questions	K - Level		
CI AI	CO1	K1 – K4	2	K1,K2	2(K3)	2(K4)
	CO2	K1 – K4	2	K1,K2	2(K3)	2(K4)
CI AII	CO3	K1 – K4	2	K1,K2	2(K3)	2(K4)
	CO4	K1 – K4	2	K1,K2	2(K3)	2(K4)
Question Pattern CIA I & II	No. of Questions to be asked		4		4	4
	No. of Questions to be answered		4		2	2
	Marks for each question		1		5	8
	Total Marks for each section		4		10	16

Distribution of Marks with K Level CIA I & CIA II

	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.6	7.2
	K2	2			2	3.6	
	K3		20		20	35.7	35.7
	K4			32	32	57.1	57.1
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	**COs**	**K - Level**	**Section A (MCQs)**		**Section B (Either / or Choice) With K - LEVEL**	**Section C (Either / or Choice) With K - LEVEL**
			No. of Questions	**K – Level**		
1	CO1	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
2	CO2	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
3	CO3	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
4	CO4	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
5	CO5	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	5			5	**3.57**	3.57
K2	5			5	**3.57**	3.57
K3		50		50	**35.72**	35.72
K4			80	80	**57.14**	57.14
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions		**PART – A**		**(10 x 1 = 10 Marks)**	
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**			**(5 x 5 = 25 Marks)**
11. a)	**Unit - I**	**CO1**	**K3**		
		OR			
11. b)	**Unit - I**	**CO1**	**K3**		
12. a)	**Unit - II**	**CO2**	**K3**		
		OR			
12. b)	**Unit - II**	**CO2**	**K3**		
13. a)	**Unit - III**	**CO3**	**K3**		
		OR			
13. b)	**Unit - III**	**CO3**	**K3**		
14. a)	**Unit - IV**	**CO4**	**K3**		
		OR			
14. b)	**Unit - IV**	**CO4**	**K3**		
15. a)	**Unit - V**	**CO5**	**K3**		
		OR			
15. b)	**Unit - V**	**CO5**	**K3**		

Answer **ALL** the questions		**PART – C**			**(5 x 8 = 40 Marks)**
16. a)	**Unit - I**	**CO1**	**K4**		
		OR			
16. b)	**Unit - I**	**CO1**	**K4**		
17. a)	**Unit - II**	**CO2**	**K4**		
		OR			
17. b)	**Unit - II**	**CO2**	**K4**		
18. a)	**Unit - III**	**CO3**	**K4**		
		OR			
18. b)	**Unit - III**	**CO3**	**K4**		
19. a)	**Unit - IV**	**CO4**	**K4**		
		OR			
19. b)	**Unit - IV**	**CO4**	**K4**		
20. a)	**Unit - V**	**CO5**	**K4**		
		OR			
20. b)	**Unit - V**	**CO5**	**K4**		

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

Course Name	PROGRAMMING IN JAVA LAB			
Course Code	23UCACP41	**L**	**P**	**C**
Category	CORE	**-**	**5**	**5**

COURSE OBJECTIVES

➤ To provide fundamental knowledge of object-oriented programming.
➤ To equip the student with programming knowledge in Core Java from the basic sup.
➤ To enable the students to know about Event Handling.
➤ To enable the students to use String Concepts.
➤ To equip the student with programming knowledge into creating GUI using AWT controls.

LAB EXERCISE	75

1. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer.
2. Write a Java program to multiply two given matrices.
3. Write a Java program that displays the number of characters, lines, and words in a text.
4. Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.
5. Write a program to do String Manipulation using Character Array and perform the following string operations: a. String length b. Finding a character at a particular position c. Concatenating two strings
6. Write a program to perform the following string operations using String class: a. String Concatenation b. Search a substring c. To extract substring from given string
7. Write a program to perform string operations using String Buffer class: a. Length of a string b. Reverse a string c. Delete a substring from the given string
8. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
9. Write a threading program which uses the same method asynchronously to print the numbers 1 to 10 using Thread1 and to print 90 to 100 using Thread2.
10. Write a program to demonstrate the use of following exceptions: a. Arithmetic Exception b. Number Format Exception Array Index Out Of Bounds Exception d. Negative Array Size Exceptions

11. Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

12. Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.

13. Write a Java program that handles all mouse events and shows the event name atThe center of the window when mouse event is fired (Use adapter classes)

14. Write a program that simulates a traffic light. The Program lets the user select one of three lights: red, yellow, or green with radio buttons.

15. Write a Java Program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +.-,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by Zero.

	Total Lecture Hours	75

BOOKS FOR STUDY:

➢ Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010

➢ Gary Cornell, Core Java 2 Volume I – Fundamentals, Addison Wesley, 1999

BOOKS FOR REFERENCES:

➢ Head First Java, O'Reilly Publications

➢ Y. Daniel Liang, Introduction to Java Programming, 7th Edition, Pearson Education India, 2010

WEB RESOURCES:

❖ **http://docs.oracle.com/javase/tutorial/**

❖ **https://javabeginnerstutorial.com/core-java-tutorial**

❖ **https://www.coursera.org**

Nature of Course	EMPLOYABILITY		✔	SKILL ORIENTED			ENTREPRENEURSHIP		
Curriculum Relevance	LOCAL		REGIONAL			NATIONAL		GLOBAL	✔
Changes Made in the Course	Percentage of Change		**50**	No Changes Made				New Course	

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.	**K1 to K4**
CO2	Implement inheritance, packages, interfaces, and exception handling of Core Java.	**K1 to K4**
CO3	Implement multi-threading and I/O Streams of Core Java.	**K1 to K4**
CO4	Implement AWT and Event handling.	**K1 to K4**
CO5	Use Swing to create GUI.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG   **M – MEDIUM**   **L – LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	2	1	3	2	3
CO 2	3	2	1	3	1	3
CO 3	3	2	1	3	2	3
CO 4	3	2	1	3	2	3
CO 5	3	2	1	3	2	3
WEITAGE	15	10	5	15	9	15
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	100	67	33	100	60	100

LESSON PLAN:

PROGRAMMING IN JAVA LAB

LIST OF PROGRAMS	HRS	PEDAGOGY
1. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer. 2. Write a Java program to multiply two given matrices. 3. Write a Java program that displays the number of characters, lines, and words in a text. 4. Generate random numbers between two given limits using Random class and print messages according to the range of the value generated. 5. Write a program to do String Manipulation using Character Array and perform the following string operations: a. String length b. Finding a character at a particular position c. Concatenating two strings 6. Write a program to perform the following string operations using String class: a. String Concatenation b. Search a substring c. To extract substring from given string 7. Write a program to perform string operations using String Buffer class: a. Length of a string b. Reverse a string c. Delete a substring from the given string 8. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, the second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number. 9. Write a threading program which uses the same method asynchronously to print the numbers 1 to 10 using Thread1 and to print 90 to 100 using Thread2. 10. Write a program to demonstrate the use of following exceptions: a. Arithmetic Exception b. Number Format Exception Array Index Out Of Bounds Exception d. Negative Array Size Exceptions 11. Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes. 12. Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls. 13. Write a Java program that handles all mouse events and shows the event name at The center of the window when mouse event is fired (Use adapter classes) 14. Write a program that simulates a traffic light. The Program lets the user select one of three lights: red, yellow, or green with radio buttons. 15. Write a Java Program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +.-,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by Zero.	**75**	**Demonstration Hands-on Training**

Internal	Cos	K Level	Syntax & Semantics	Programmingprinciples	Concept Applications	Coding& Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	2.5	2.5	2.5	2.5	2.5
		Total Marks for each section	5	5	5	5	5

	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
Distribution of Marks with K Level CIA									
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

S. No.	Cos	K Level	Syntax & Semantics	Programmingprinciples	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level

K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	**15**	**15**	**15**	**15**	**15**	**75**	**100**	**100**

Course Name	DATA BASE MANAGEMENT SYSTEM			
Course Code	23UCAEC41	**L**	**P**	**C**
Category	ELECTIVE CORE	3	-	3

COURSE OBJECTIVES:

➢ To enable the students to learn the designing of database systems, foundation on the relational model of data and normal forms.
➢ To understand the concepts of database management system, design simple database models.
➢ To learn and understand to write queries using SQL, PL/SQL.
➢ To enable the students to learn the designing of database systems, foundation on the relational model of data and normal forms.
➢ To understand the concepts of database management system, design simple database models.

UNIT – I	**Database Concepts**	9

Database Concepts: Database Systems - Data vs Information - Introducing the database - File system - Problems with file system – Database systems. Data models - Importance - Basic Building Blocks - Business rules - Evolution of Data models - Degrees of Data Abstraction

UNIT - II	**Design Concepts**	9

Design Concepts: Relational database model - logical view of data - keys - Integrity rules - relational set operators - data dictionary and the system catalog - relationships - data redundancy revisited - indexes - Codd's rules. Entity-relationship model - ER diagram

UNIT - III	**Normalization, Introduction to SQL**	9

Normalization of Database Tables: Database tables and Normalization – The Need for Normalization – The Normalization Process – Higher level Normal Form.
Introduction to SQL: Data Definition Commands – Data Manipulation Commands – SELECT Queries – Additional Data Definition Commands – Additional SELECT Query Keywords – Joining Database Tables.

UNIT - IV	**Advanced SQL, Sub Queries and Correlated Queries, SQL Functions**	9

Advanced SQL: Relational SET Operators: UNION – UNION ALL – INTERSECT - MINUS. SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join.
Sub Queries and Correlated Queries: WHERE – IN – HAVING – ANY and ALL – FROM.
SQL Functions: Date and Time Function – Numeric Function – String Function – Conversion Function.

UNIT - V	**PL/SQL, Cursors and Exceptions**	9

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Variable Declaration – Assignment operation – Arithmetic operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements.
PL/SQL Cursors and Exceptions: Cursors – Implicit Cursors, Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Curso Variables – Exceptions – Types of Exceptions.

	Total Lecture Hours	**45**

BOOKS FOR STUDY:

➢ Coronel, Morris, Rob, "Database Systems, Design, Implementation and Management", Ninth Edition

➢ Nilesh Shah, "Database Systems Using Oracle", 2nd edition, Pearson Education India, 2016

BOOKS FOR REFERENCES:

➢ Abraham Silberschatz, Henry F. Korth and S. Sudarshan, —Database System Concepts‖, McGraw Hill International Publication, VI Edition

➢ Shio Kumar Singh, —Database Systems—, Pearson publications, II Edition

WEB RESOURCES:

❖ **Web resources from NDL Library, E-content from open-source libraries /**

Nature of Course	EMPLOYABILITY	✔	SKILL ORIENTED		ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL		REGIONAL	NATIONAL	GLOBAL	✔
Changes Made in the Course	Percentage of Change	25	No Changes Made		New Course	

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Understand the various basic concepts of Database System. Difference between file system and DBMS and compare various data models.	**K1 to K4**
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.	**K1 to K4**
CO3	Design database schema considering normalization and relationships within the database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML).	**K1 to K4**
CO4	Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.	**K1 to K4**
CO5	Learn to design Database operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions.	**K1 to K4**
MAPPING WITH PROGRAM OUTCOMES:		

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	M	M	M	M	M	M	L	L
CO2	S	S	M	M	M	M	M	L	M	L

CO3	M	M	M	S	M	S	L	M	L	M
CO4	M	M	M	S	S	S	L	L	M	M
CO5	M	M	S	M	M	M	M	S	L	M

S- STRONG **M – MEDIUM** **L - LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	3	3	3	3	3	3
CO 2	3	3	3	3	2	3
CO 3	3	3	3	3	3	3
CO 4	3	3	2	3	3	3
CO 5	3	3	3	3	3	2
WEIGHTAGE	15	15	14	15	14	14
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	100	100	93	100	93	93

LESSON PLAN:

UNIT	DATA BASE MANAGEMENT SYSTEM	HRS	PEDAGOGY
I	**Database Concepts:** Database Systems - Data vs Information - Introducing the database - File system - Problems with file system – Database systems. Data models - Importance - Basic Building Blocks - Business rules - Evolution of Data models - Degrees of Data Abstraction	9	**Black Board/PPT**
II	**Design Concepts:** Relational database model - logical view of data - keys - Integrity rules - relational set operators - data dictionary and the system catalog - relationships - data redundancy revisited - indexes - Codd's rules. Entity-relationship model - ER diagram	9	**Black Board/PPT**
III	**Normalization of Database Tables:** Database tables and Normalization – The Need for Normalization – The Normalization Process – Higher level Normal Form. **Introduction to SQL:** Data Definition Commands – Data Manipulation Commands – SELECT Queries – Additional Data Definition Commands – Additional SELECT Query Keywords – Joining Database Tables.	9	**Black Board/PPT**
IV	**Advanced SQL:** Relational SET Operators: UNION – UNION ALL – INTERSECT - MINUS. SQL Join Operators: Cross Join – Natural Join – Join USING Clause – JOIN ON Clause – Outer Join. **Sub Queries and Correlated Queries:** WHERE – IN – HAVING – ANY and ALL – FROM. **SQL Functions:** Date and Time Function – Numeric Function – String Function – Conversion Function.	9	**Black Board/PPT**
V	**PL/SQL:** A Programming Language: History – Fundamentals – Block	9	**Black Board/PPT**

Structure – Comments – Data Types – Other Data Types – Variable Declaration – Assignment operation – Arithmetic operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements.

PL/SQL Cursors and Exceptions: Cursors – Implicit Cursors, Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	**Cos**	**K Level**	**Section A**		**Section B** **Either or** **Choice**	**Section C** **Either or Choice**
			MCQs			
			No. of. **Questions**	**K -** **Level**		
CI **AI**	CO1	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
	CO2	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
CI **AII**	CO3	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
	CO4	**K1 – K4**	2	K1,K2	2(K3)	2(K4)
Question **Pattern** **CIA I & II**		**No. of Questions to be asked**	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K **Level**	**Section A** **(Multiple** **Choice** **Questions)**	**Section B** **(Either /** **Or Choice)**	**Section C** **(Either /** **Or Choice)**	**Total** **Marks**	**% of (Marks** **without choice)**	**Consolidate of %**
CIA **I**	**K1**	2			2	**3.6**	**7.2**
	K2	2			2	**3.6**	
	K3		20		20	**35.7**	35.7
	K4			32	32	**57.1**	57.1
	Marks	4	20	32	56	100	100
CIA **II**	**K1**	2			2	**3.6**	**7.2**
	K2	2			2	**3.6**	
	K3		20		20	**35.7**	35.7
	K4			32	32	**57.1**	57.1
	Marks	4	20	32	56	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	**COs**	**K - Level**	**Section A (MCQs)**		**Section B (Either / or Choice) With K - LEVEL**	**Section C (Either / or Choice) With K - LEVEL**
			No. of Questions	**K – Level**		
1	CO1	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
2	CO2	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
3	CO3	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
4	CO4	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
5	CO5	**K1-K4**	2	K1,K2	2 (K3)	2 (K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

Distribution of Marks with K Level						
K Level	**Section A (Multiple Choice Questions)**	**Section B (Either or Choice**	**Section C (Either/ or Choice)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	5			5	**3.57**	3.57
K2	5			5	**3.57**	3.57
K3		50		50	**35.72**	35.72
K4			80	80	**57.14**	57.14
Marks	**10**	**50**	**80**	**140**	**100**	**100**
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.						

Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer **ALL** the questions **PART – A**				**(10 x 1 = 10 Marks)**	
1.	**Unit - I**	**CO1**	**K1**		
				a)	b)
				c)	d)
2.	**Unit - I**	**CO1**	**K2**		
				a)	b)
				c)	d)
3.	**Unit - II**	**CO2**	**K1**		
				a)	b)
				c)	d)
4.	**Unit - II**	**CO2**	**K2**		
				a)	b)
				c)	d)
5.	**Unit - III**	**CO3**	**K1**		
				a)	b)
				c)	d)
6.	**Unit - III**	**CO3**	**K2**		
				a)	b)
				c)	d)
7.	**Unit - IV**	**CO4**	**K1**		
				a)	b)
				c)	d)
8.	**Unit - IV**	**CO4**	**K2**		
				a)	b)
				c)	d)
9.	**Unit - V**	**CO5**	**K1**		
				a)	b)
				c)	d)
10.	**Unit - V**	**CO5**	**K2**		
				a)	b)
				c)	d)

Answer **ALL** the questions		**PART – B**		**(5 x 5 = 25 Marks)**	
11. a)	**Unit - I**	**CO1**	**K3**	
		OR			
11. b)	**Unit - I**	**CO1**	**K3**	
12. a)	**Unit - II**	**CO2**	**K3**	
		OR			
12. b)	**Unit - II**	**CO2**	**K3**	
13. a)	**Unit - III**	**CO3**	**K3**	
		OR			
13. b)	**Unit - III**	**CO3**	**K3**	
14. a)	**Unit - IV**	**CO4**	**K3**	
		OR			
14. b)	**Unit - IV**	**CO4**	**K3**	
15. a)	**Unit - V**	**CO5**	**K3**	
		OR			
15. b)	**Unit - V**	**CO5**	**K3**	

Answer **ALL** the questions		**PART – C**		**(5 x 8 = 40 Marks)**	
16. a)	**Unit - I**	**CO1**	**K4**	
		OR			
16. b)	**Unit - I**	**CO1**	**K4**	
17. a)	**Unit - II**	**CO2**	**K4**	
		OR			
17. b)	**Unit - II**	**CO2**	**K4**	
18. a)	**Unit - III**	**CO3**	**K4**	
		OR			
18. b)	**Unit - III**	**CO3**	**K4**	
19. a)	**Unit - IV**	**CO4**	**K4**	
		OR			
19. b)	**Unit - IV**	**CO4**	**K4**	
20. a)	**Unit - V**	**CO5**	**K4**	
		OR			
20. b)	**Unit - V**	**CO5**	**K4**	

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

DEPARTMENT OF COMPUTER APPLICATIONS

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

Course Name	BIOMETRICS			
Course Code	23UCASC41	**L**	**P**	**C**
Category	SKILLED	2	-	2

COURSE OBJECTIVES:

➢ Identify the various biometric technologies.
➢ Design of biometric recognition.
➢ Develop simple applications for privacy.
➢ Understand the need of biometric in the society.
➢ Understand the scope of biometric techniques.

UNIT – I Introduction, Face Biometrics	6

Introduction: What is Biometrics, History, Types of biometric Traits, General architecture of biometric systems, Basic working of biometric matching, Biometric system error and performance measures, Design of biometric system, Applications of biometrics, Biometrics versus traditional authentication methods.

Face Biometrics: Introduction, Background of Face Recognition, Design of Face Recognition System, Neural Network for Face Recognition, Face Detection in Video Sequences, Challenges in Face Biometrics, Face Recognition Methods, Advantages and Disadvantages.

UNIT - II Retina and Iris Biometrics, Vein and Fingerprint Biometrics	6

Retina and Iris Biometrics: Introduction, Performance of Biometrics, Design of Retina Biometrics, Design of Iris Recognition System, Iris Segmentation Method, Determination of Iris Region, Applications of Iris Biometrics, Advantages and Disadvantages.

Vein and Fingerprint Biometrics: Introduction, Biometrics Using Vein Pattern of Palm, Fingerprint Biometrics, Fingerprint Recognition System, Minutiae Extraction, Fingerprint Indexing, Experimental Results, Advantages and Disadvantages.

UNIT - III Privacy Enhancement Using Biometrics, Multimodal Biometrics	6

Privacy Enhancement Using Biometrics: Introduction, Privacy Concerns Associated with Biometric Deployments, Identity and Privacy, Privacy Concerns, Biometrics with Privacy Enhancement, Comparison of Various Biometrics in Terms of Privacy, Soft Biometrics.

Multimodal Biometrics: Introduction to Multimodal Biometrics, Basic Architecture of Multimodal Biometrics, Multimodal Biometrics Using Face and Ear, Characteristics and Advantages of Multimodal Biometrics.

UNIT - IV Watermarking Techniques	6

Watermarking Techniques: Introduction, Data Hiding Methods, Basic Framework of Watermarking, Classification of Watermarking, Applications of Watermarking, Attacks on Watermarks, Performance Evaluation, Characteristics of Watermarks, General Watermarking Process, Image Watermarking Techniques, Watermarking Algorithm, Experimental Results, Effect of Attacks on Watermarking Techniques, Attacks on Spatial Domain Watermarking.

UNIT - V Scope and Future, Biometric Standards	6

Scope and Future: Scope and Future Market of Biometrics, Biometric Technologies, Applications of Biometrics, Biometrics and Information Technology Infrastructure, Role of Biometrics in Enterprise Security, Role of Biometrics in Border Security, Smart Card Technology and Biometrics, Radio Frequency Identification (RFID) Biometrics, DNA Biometrics, Comparative Study of Various Biometric Techniques.

Biometric Standards: Introduction, Standard Development Organizations, Application Programming Interface (API), Information Security and Biometric Standards, Biometric Template Interoperability.

	Total Lecture Hours	30

BOOKS FOR STUDY:

➢ Biometrics: Concepts and Applications by G.R. Sinha and Sandeep B. Patil, Wiley, 2013

BOOKS FOR REFERENCES:

➢ Guide to Biometrics by Ruud M. Bolle, SharathPankanti, Nalini K. Ratha, Andrew W. Senior, Jonathan H. Connell, Springer 2009

➢ Introduction to Biometrics by Anil K. Jain, Arun A. Ross, KarthikNandakumar

➢ Handbook of Biometrics by Anil K. Jain, Patrick Flynn, Arun A. Ross.

WEB RESOURCES:

❖ **Web resources from NDL Library, E-content from open-source libraries /**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL	REGIONAL	NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change		No Changes Made		New Course	✓
***Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.**						

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	To understand the basic concepts and the functionality of the Biometrics, Face Biometrics, Types, Architecture, and Applications.	**K1 & K2**
CO2	To know the concepts Retina and Iris Biometrics and Vein and Fingerprint Biometrics.	**K1 & K2**
CO3	To analyze the Privacy Enhancement and Multimodal Biometrics.	**K1 & K2**
CO4	To gain analytical idea on Watermarking Techniques.	**K1 & K2**
CO5	To gain knowledge on Future scope of Biometrics, and Study of various Biometric Techniques.	**K1 & K2**

MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	M	S	M	S	L	L
CO2	S	S	S	M	M	S	M	L	M	L
CO3	M	M	S	M	S	M	L	M	L	M
CO4	S	S	S	M	M	M	S	L	M	M
CO5	M	S	M	M	M	S	S	M	L	M
S- STRONG				**M – MEDIUM**				**L - LOW**		

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	1	3	2	2	1	1
CO 2	3	1	3	2	3	3
CO 3	3	2	1	-	2	3
CO 4	3	-	3	3	3	1
CO 5	3	3	3	3	1	2
WEIGHTAGE	**13**	**9**	**12**	**10**	**10**	**10**
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	87	60	80	67	67	67

LESSON PLAN:

UNIT	BIOMETRICS	HRS	PEDAGOGY
I	**Introduction:** What is Biometrics, History, Types of biometric Traits, General architecture of biometric systems, Basic working of biometric matching, Biometric system error and performance measures, Design of biometric system, Applications of biometrics, Biometrics versus traditional authentication methods. **Face Biometrics:** Introduction, Background of Face Recognition, Design of Face Recognition System, Neural Network for Face Recognition, Face Detection in Video Sequences, Challenges in Face Biometrics, Face Recognition Methods, Advantages and Disadvantages.	6	**Black Board/PPT**

II	**Retina and Iris Biometrics:** Introduction, Performance of Biometrics, Design of Retina Biometrics, Design of Iris Recognition System, Iris Segmentation Method, Determination of Iris Region, Applications of Iris Biometrics, Advantages and Disadvantages. **Vein and Fingerprint Biometrics:** Introduction, Biometrics Using Vein Pattern of Palm, Fingerprint Biometrics, Fingerprint Recognition System, Minutiae Extraction, Fingerprint Indexing, Experimental Results, Advantages and Disadvantages.	**6**	**Black Board/PPT**
III	**Privacy Enhancement Using Biometrics:** Introduction, Privacy Concerns Associated with Biometric Deployments, Identity and Privacy, Privacy Concerns, Biometrics with Privacy Enhancement, Comparison of Various Biometrics in Terms of Privacy, Soft Biometrics. **Multimodal Biometrics:** Introduction to Multimodal Biometrics, Basic Architecture of Multimodal Biometrics, Multimodal Biometrics Using Face and Ear, Characteristics and Advantages of Multimodal Biometrics.	**6**	**Black Board/PPT**
IV	**Watermarking Techniques:** Introduction, Data Hiding Methods, Basic Framework of Watermarking, Classification of Watermarking, Applications of Watermarking, Attacks on Watermarks, Performance Evaluation, Characteristics of Watermarks, General Watermarking Process, Image Watermarking Techniques, Watermarking Algorithm, Experimental Results, Effect of Attacks on Watermarking Techniques, Attacks on Spatial Domain Watermarking.	**6**	**Black Board/PPT**
V	**Scope and Future:** Scope and Future Market of Biometrics, Biometric Technologies, Applications of Biometrics, Biometrics and Information Technology Infrastructure, Role of Biometrics in Enterprise Security, Role of Biometrics in Border Security, Smart Card Technology and Biometrics, Radio Frequency Identification (RFID) Biometrics, DNA Biometrics, Comparative Study of Various Biometric Techniques. **Biometric Standards:** Introduction, Standard Development Organizations, Application Programming Interface (API), Information Security and Biometric Standards, Biometric Template Interoperability.	**6**	**Black Board/PPT**

			Section A	
			MCQs	
Internal	**Cos**	**K Level**	**No. of. Questions**	**K - Level**
CI **AI**	**CO1**	**K1 – K2**	25	**K1,K2**
	CO2	**K1 – K2**	25	**K1,K2**
CI **AII**	**CO3**	**K1 – K2**	25	**K1,K2**
	CO4	**K1 – K2**	25	**K1,K2**
Question Pattern **CIA I & II**		**No. of Questions to be asked**	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

Table heading: **Learning Outcome Based Education & Assessment (LOBE)**
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (Ist Test-2 CO's & IInd Test-2 CO's) in equal weightage

	K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidate of %**
CIA I	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	**K1**	30	30	60	**100**
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

Table heading: **Distribution of Marks with K Level CIA I & CIA II**

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	**COs**	**K - Level**	**Section A (MCQs)**	
			No. of Questions	**K – Level**
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	**Section A (Multiple Choice Questions)**	**Total Marks**	**% of (Marks without choice)**	**Consolidated %**
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.				

Course Name	PHP PROGRAMMING LAB			
Course Code	23UCASP41	L	P	C
Category	SKILLED	-	2	2

COURSE OBJECTIVES

➢ To provide the necessary knowledge on basics of PHP.
➢ To design and develop dynamic, database-driven web applications using PHP version.
➢ To get an experience on various web application development techniques.
➢ To learn the necessary concepts for working with the files using PHP.
➢ To get a knowledge on OOPS with PHP.

S. No	LAB EXERCISE	30

1. Get name of the user from a form and show greeting text.

2. Write a PHP program to check whether given number is palindrome or not.

3. Write a PHP program to check whether given number is Armstrong or not.

4. Write a PHP program to find largest values of two numbers using nesting of function

5. Write a Mathematical calculator program.

6. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.

7. Write a PHP program to display a digital clock which displays the current time of the server

8. Write a PHP program using function.

9. Write a PHP program to Array manipulation.

10. Write a PHP program to design personal information

11. Create a PHP page for login page with sql connection.

12. Write a PHP program to Read from existing file.

13. Write a PHP program to Write a file

14. Write a PHP program to design Curriculum Vitae.

15. Write a PHP program hit counter using cookies.

16. Create a web page to advertise a product of the company using images and audio.

17. Create a web page for Travel agency.

18. Create a web page for software company websites.

	Total Lecture Hours	30

BOOKS FOR STUDY:

➤ Head First PHP & MySQL: A Brain-Friendly Guide - 2009 - Lynn Mighley and Michael Morrison.

➤ The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL - Alan Forbes

BOOKS FOR REFERENCES:

➤ PHP: The Complete Reference - Steven Holzner.

➤ DT Editorial Services (Author), "HTML5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)", Paperback 2016, 2nd Edition.

WEB RESOURCES:

❖ **Refer MOOC Courses like NPTEL and SWAYAM**

❖ **https://www.w3schools.com/php/default.asp**

Nature of Course	EMPLOYABILITY		SKILL ORIENTED	✓	ENTREPRENEURSHIP	
Curriculum Relevance	LOCAL	REGIONAL	NATIONAL		GLOBAL	✓
Changes Made in the Course	Percentage of Change	50	No Changes Made		New Course	

*Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.

COURSE OUTCOMES:		K LEVEL
After studying this course, the students will be able to:		
CO1	Write PHP scripts to handle HTML forms.	**K1 to K4**
CO2	Write regular expressions including modifiers, operators, and metacharacters.	**K1 to K4**
CO3	Create PHP Program using the concept of array.	**K1 to K4**
CO4	Create PHP programs that use various PHP library functions.	**K1 to K4**
CO5	Manipulate files and directories.	**K1 to K4**

MAPPING WITH PROGRAM OUTCOMES:

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

S- STRONG   **M – MEDIUM**   **L – LOW**

CO / PO MAPPING:

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO 1	2	2	2	2	3	2
CO 2	2	1	3	2	-	2
CO 3	3	3	1	1	1	2
CO 4	2	3	3	1	-	1
CO 5	3	2	3	1	1	-
WEITAGE	12	11	12	7	5	7
WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS	80	80	60	67	53	53

LESSON PLAN:

PHP PROGRAMMING LAB

LIST OF PROGRAMS	HRS	PEDAGOGY
1. Get name of the user from a form and show greeting text. 2. Write a PHP program to check whether given number is palindrome or not. 3. Write a PHP program to check whether given number is Armstrong or not. 4. Write a PHP program to find largest values of two numbers using nesting of function 5. Write a Mathematical calculator program. 6. Write a PHP program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings. 7. Write a PHP program to display a digital clock which displays the current time of the server 8. Write a PHP program using function. 9. Write a PHP program to Array manipulation. 10. Write a PHP program to design personal information 11. Create a PHP page for login page with sql connection. 12. Write a PHP program to Read from existing file. 13. Write a PHP program to Write a file 14. Write a PHP program to design Curriculum Vitae. 15. Write a PHP program hit counter using cookies. 16. Create a web page to advertise a product of the company using images and audio. 17. Create a web page for Travel agency. 18. Create a web page for software company websites.	30	Demonstration Hands-on Training

Learning Outcome Based Education & Assessment (LOBE)
Formative Examination - Blue Print
Articulation Mapping – K Levels with Course Outcomes (COs)

Internal	Cos	K Level	Syntax & Semantics	Programmingprinciples	Concept Applications	Coding & Implementation	Debugging & Output
CI AI	CO1	K1	5				
	CO2	K2		5			
	CO3	K3			5		
	CO4	K3				5	
	CO5	K4					5
Question Pattern CIA		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	2.5	2.5	2.5	2.5	2.5
		Total Marks for each section	5	5	5	5	5

	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

Distribution of Marks with K Level CIA

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)

S. No.	Cos	K Level	Syntax & Semantics	Programmingprinciples	Concept Applications	Coding& Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level

K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	**15**	**15**	**15**	**15**	**15**	**75**	**100**	**100**

Distribution of Marks with K Level CIA									
	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
CIA	K1	5					5	20	20
	K2		5				5	20	20
	K3			5	5		10	40	40
	K4					5	5	20	20
	Marks						25	100	100

K1- Remembering and recalling facts with specific answers

K2- Basic understanding of facts and stating main ideas with general answers

K3- Application oriented- Solving Problems

K4- Examining, analyzing, presentation and make inferences with evidences

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S.No.	Cos	K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding & Implementation	Debugging & Output
1	CO1	K1	15				
2	CO2	K2		15			
3	CO3	K3			15		
4	CO4	K3				15	
5	CO5	K4					15
Question Pattern		No. of Questions to be asked	2	2	2	2	2
		No. of Questions to be answered	2	2	2	2	2
		Marks for each question	7.5	7.5	7.5	7.5	7.5
		Total Marks for each section	15	15	15	15	15

Distribution of Marks with K Level								
K Level	Syntax & Semantics	Programming principles	Concept Applications	Coding	Debugging & Output	Total Marks	% of (Marks without choice)	Consolidated %
K1	15					15	20	20
K2		15				15	20	20
K3			15	15		30	40	40
K4					15	15	20	20
Marks	15	15	15	15	15	75	100	100