



# **Program Code: UCA**

# 2021-2022 onwards



# MANNAR THIRUMALAI NAICKER COLLEGE

(AUTONOMOUS) Re-accredited with "A" Grade by NAAC PASUMALAI, MADURAI – 625 004

#### **Eligibility for Admission**

Candidates should have passed the Higher Secondary Examination with 10 + 2 pattern conducted by the Board of Higher Secondary Education, Govt. of Tamil Nadu or any other Examinations accepted by the Syndicate as equivalent there to and the candidate should have studied +2 level Mathematics with Physics/ Commerce/ Economics as subject of study in the 10 + 2 pattern**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 / Company Secretarial Practice and Modern Office Management Part II : English

Part III

:

- 1. Core Subjects
- 2. Allied Subjects
- 3. Electives

Part IV

- 1. Non Major Electives (II Year)
- 2. Skill Based Subjects
- 3. Environmental Studies Mandatory Subject
- 4. Value Education Mandatory Subject

Part V

**Extension Activities** 

#### Pattern of the question paper for the Continuous Internal Assessment Note: Duration – 1 hour (For Part I, Part II & Part III)

# The components for continuous internal assessment are:Part -AFour multiple choice questions (answer all) $4 \times 01 = 04$ MarksPart -B $3 \times 02 = 06$ MarksThree short answers questions (answer all) $3 \times 02 = 06$ MarksPart -C $2 \times 05 = 10$ MarksTwo questions ('either .... or 'type) $2 \times 05 = 10$ MarksPart -D $1 \times 10 = 10$ Marks

Total

30 Marks

\_\_\_\_\_

#### The scheme of Examination for Part-I, II & III

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	5 marks
Assignment	5 marks
Total	25 Marks

## Pattern of the question paper 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					
Short answer questions (one question from each unit)	5 x02	= 10 Marks			
Part –C					
Five Paragraph questions ('either or 'type)	5 x 05	= 25 Marks			
(One question from each Unit)					
Part –D					
Three Essay questions out of five	3 x 10	=30 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) Pattern of the questions paper for the continuous Internal Assessment

**45 MCQs will be asked for each internal assessment tests** (45 x 1=45 Marks) **and converted for 15 marks** 

The components for continuous internal assessment are:

Total	25 Marks
Assignment	5 marks
Seminar /Group discussion	5 marks
Two tests and their average	15 marks

#### **Summative Examination Pattern**

Pattern of the Question Paper for Skill Based Papers (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

#### The Scheme of Examination (Environmental Studies and Value Education)

Two tests and their average	15 marks
Project Report	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.

#### **Question Paper Pattern**

#### (Internal Assessment)

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

**45 MCQs will be asked for each internal assessment tests** (45 x 1=45 Marks) **and converted for 15 marks** 

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Two tests and their average		 15 marks
Project		 10 marks
	Total	25 Marks

**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

#### Pattern of the Question Paper for (Internal Examination & Summative Examination)

Internal Examinations- - 40 MarksSummative Examinations- - 60 Marks

100

#### **Minimum Marks for a Pass**

40% of the aggregate (Internal +Summative Examinations).

No separate pass minimum for the Internal Examinations.

27 marks out of 75 is the pass minimum for the Summative Examinations.

#### Vision

To mould the students with good academic record in addition to sufficient soft skills and make them qualified computer professional in the global environment.

#### Mission

- To organize seminar, symposium, workshop keep pace with the current trends and enhance the talents of the students and motivate our students to acquire progressive and long term employment with well reputed companies.
- Empowering the youth in rural communities with computer education.
- To Provide students with the tools to become productive, participating global citizens and lifelong learners
- To enable the students to acquire globally competence through developing their problem solving skills and exposure to latest developments in area of computer applications
- To educate the students about their professional, social and ethical responsibilities

The 12 Graduate Attributes\*:

- 1. (KB) A knowledge base for engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.
- 2. (PA) Problem analysis: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions
- 3. (Inv.) Investigation: An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data and synthesis of information in order to reach valid conclusions.
- 4. (Des.) Design: An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
- 5. (Tools) Use of engineering tools: An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.
- 6. (Team) Individual and teamwork: An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.
- 7. (Comm.) Communication skills: An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading,

writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.

- 8. (Prof.) Professionalism: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.
- 9. (Impacts) Impact of engineering on society and the environment: An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.
- 10. (Ethics) Ethics and equity: An ability to apply professional ethics, accountability, and equity.
- 11. (Econ.) Economics and project management: An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of engineering and to understand their limitations.
- 12. (LL) Life-long learning: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge

WA	Graduate Attributes	Caption as			
WA1	Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	Knowledge Base			
WA2	An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions	Problem Analysis &			
WA4	An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data and synthesis of information in order to reach valid conclusions.	Investigation			
WA10	An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.	Communicat			
WA3	An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.	ion Skills & Design			
WA9	An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.	Individual and Team Work			
WA6	An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.	Professionali sm, Ethics and equity			

WA8	An ability to apply professional ethics, accountability, and equity.	Ethics and
		equity
WA12	An ability to identify and to address their own educational needs in a	Life long
	changing world in ways sufficient to maintain their competence and to	learning
	allow them to contribute to the advancement of knowledge	learning
WA5	Use of engineering tools: An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools	
	to a range of engineering activities from simple to complex with an	
	understanding of the associated limitations	
	understanding of the associated minitations.	
WA7	Impact of engineering on society and the environment: An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.	
	An ability to appropriately incorporate economics and business practices	Economics
WA11	including project, risk, and change management into the practice of	and Project
	engineering and to understand their limitations	Management

PROGI	RAM EDUCATIONAL OBJECTIVES (PEOs)
<b>PEO1</b> :	Inculcate graduates to pursue variety of careers in IT industries by providing
	expected domain knowledge
<b>PEO2</b> :	Prepare to employ their skill with a strong base for higher Education and research
	activities in order to cater to the needs of industry and society
<b>PEO3</b> :	Excel as socially committed individual by providing technical and soft skills with
	ethical standards, nurture to be an effective team member, infuse leadership
	qualities and protect the environment
<b>PEO4</b> :	To be able to adapt to the evolving technical challenges and changing career
	opportunities.
<b>PEO5</b> :	Graduate of the program will have skills to develop applications with innovation
<b>PEO6</b> :	Implement their problem- solving skills in professional practices and face social,
	technical and business challenges.

PO NO	PROGRAMME OUTCOMES (POs)	
At the end	of the programme, the students will be able to	
PO – 1	Demonstrate the knowledge and understanding of Science concepts and its relevant fields.	Disciplinary Knowledge
PO – 2	Identify, formulate, analyse complex problems and reach valid conclusions using the methodologies of Science.	Problem Solving
PO – 3	Employ critical and analytical thinking in understanding the concepts and apply them in various problems appearing in different branches of Science.	Analytical Reasoning & Critical Thinking
PO - 4	Communicate the known concepts effectively within the profession and with any forum	Communication Skills
PO - 5	Function successfully as a member/leader in any team and to apply ethics, accountability and equity in their life.	Team Work and Moral/Ethical Awareness
PO - 6	Use ICT tools in various learning situations, related information sources, suitable software to analyze data and furthermore participating in learning activities throughout life to meet the demands of work place through knowledge /up-skilling / re-skilling	Digital Literacy & Life-long Learning

PROG	RAM SPECIFIC OUTCOME (PSOs)
PSO1:	Provide the students about computing principles and business practices in software
	solutions, outsourcing services, public and private sectors
PSO2:	Analyze and synthesis computing systems through quantitative and qualitative
	techniques
PSO3:	Envisage and work on laboratory and multi- disciplinary tasks in computer
	applications.
PSO4:	Combination of computer application and allied subjects make them competent and
	face industrial challenges
PSO5:	Expertise to communicate in both oral and written forms, demonstrating the practice of
	professional ethics and the concerns for social welfare.
PSO6:	Acquiring In-depth knowledge & sustained learning leading to innovation,
	permutation, modernization and enrichment to fulfill global interest.



# MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous), Pasumalai BCA Curriculum

Course	Title of the Course	Hrs	Cre	Maximum Marks		<b>Iarks</b>
Code			dits	Int	Ext	Total
FIRST SEMESTER						
Part – I	Tamil / Alternative Course					
21UTAG11	இக்காலக் கவிதையும் நாடகமும்	6	3	25	75	100
Part – II	English					
21UENG11	Communicative English -I	6	3	25	75	100
Part - III	Core Courses					
21UCAC11	Programming in C	5	5	25	75	100
21UCACP1	Programming in C Lab	4	4	40	60	100
Part III	Allied Course					
21UMCA11	Mathematical Foundations	5	4	25	75	100
Part IV	Skill Based Course					
21UCASP1	MULTIMEDIA LAB	2	2	40	60	100
Part IV	Mandatory Course					
21UEVG11	Environmental Studies	2	2	25	75	100
	Total	30	23	205	495	700
	SECOND SEMES	ΓER				
Part – I	Tamil / Alternative Course					
21UTAG21	இடைக்கால இலக்கியமும் சிறுகதையும்	6	3	25	75	100
Part – II	English					
21UENG21	Communicative English -II	6	3	25	75	100
Part - III	Core Courses					
21UCAC21	Data Structures using C++	5	5	25	75	100
21UCACP2	Data Structures using C++ Lab	4	4	40	60	100
Part III	Allied Course					
21UMCA21	Probability and Statistics	5	4	25	75	100
Part IV	Skill Based Course					
21UCASP2	PHP Lab	2	2	40	60	100
21UEVG21	Value Education	2	2	25	75	100
	Total	30	23	205	495	700

(For the student admitted during the academic year 2021-2022 onwards)

	THIRD SEMESTER					
Part – I	Tamil / Alternative Course					
211174631	காப்பிய இலக்கியமும்	6	3	25	75	100
2101A031	உரைநடையும்	0	5	23	15	100
Part – II	English					
21UENG31	Communicative English -III	6	3	25	75	100
Part - III	Core Courses					
21UCAC31	Java Programming	5	5	25	75	100
21UCACP3	Java Programming Lab	4	4	40	60	100
Part III	Allied Course					
21UCOA32	Principles of Accounting	5	4	25	75	100
Part IV	Skill Based Course					
21UCASP3	Python Lab	2	2	40	60	100
Part IV	Non Major Elective Course					
21UCAN31	HTML Programming	2	2	25	75	100
	Total	30	23	205	495	700
	FOURTH SEMEST	<b>FER</b>	•			
Part – I	Tamil / Alternative Course					
21UTAG41	பண்டைய இலக்கியமும்	6	3	25	75	100
2101/1041	புதினமும்	0	5	23	15	100
Part – II	English					
21UENG41	Communicative English -IV	6	3	25	75	100
Part - III	Core Courses					
21UCAC 41	Database Management System	5	4	25	75	100
21UCACP4	Database Management System Lab	4	4	40	60	100
Part III	Allied Course					
21UCOA42	Basics of Cost Accounting	5	4	25	75	100
Part IV	Skill Based Course					
21UCASP4	R Programming Lab	2	2	40	60	100
Part IV	Non Major Elective Course					
21UCAN41	Multimedia	2	2	25	75	100
Part V	Extension Activities					
21UEAG40	NSS, NCC, YRC		1	40	60	100
21UEAG49		-	1	40	00	100
	Total	30	23	245	555	800

	FIFTH SEMESTI	ER				
Part - III	Core Courses					
21UCAC51	Operating system	6	4	25	75	100
21UCAC52	Computer Networks	6	4	25	75	100
21UCACP5	Linux Lab	6	4	40	60	100
Part III	Core Elective					
21UCAE51	Data mining and Warehousing	5	5	25	75	100
21UCAE52	Software Project Management					
21UCAE53	Internet of Things					
	Core Elective II					
21UCAE54	Cloud computing	5	5	25	75	100
21UCAE55	Management Information Systems					
21UCAE56	Artificial Intelligence					
Part IV	Skill Based Course					
21UCASP5	Data mining Lab	2	2	40	60	100
	Total	30	24	180	420	600
SIXTH SEM	ESTER					
Part - III	Core Courses					
21UCAC61	C# and .Net Programming	6	4	25	75	100
21UCACP6	C# and .Net Programming Lab	6	4	40	60	100
21UCAPR1	Project and viva - voce	6	4	40	60	100
Part III	Core Elective I					
21UCAE61	Cyber Security	5	5	25	75	100
21UCAE62	Client server Computing					
21UCAE63	Mobile Computing					
	Core Elective II					
21UCAE64	Computer Graphics	5	5	25	75	100
21UCAE65	Software Testing					
21UCAE66	Big Data Analytics					
Part IV	Skill Based Course					
21UCASP6	Android Development Lab	2	2	40	60	100
	Total	30	24	195	405	600
	Grand Total	180	140	1235	2865	4100





# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	PROGRAMMING IN	С						
Course Code	21UCAC11					L	Р	С
Category	Core					5	-	5
Nature of cours	e: EMPLOYABILITY	✓	SKILL ORIENTED	✓	ENTREPI	RENI	EURS	HIP
Course Objecti	ves:							
• To learn cor	• To learn computer programming using the C programming language							
• To learn the	basic programming con	istruc	cts, so that they can early a start of the second	asily	switch ov	er to	any	other
language in	luture.	4	waaful in dahuaaina					
<ul> <li>To describe</li> <li>To devalop</li> </ul>	and employ strategies that	it are	useful in debugging	nnlia	ations in C			
<ul> <li>To develop .</li> <li>To applyze</li> </ul>	nogics which will help the	to ah	create programs and a	ppnc	ations in C	vod	and r	vhan
• 10 analyze	ll produce a better progra	io cii	loose when regular loo	ops s	snould be t	iseu	and	when
Unit · I Ove	rview of C						15 H	ours
History of C. Ba	asic structure of C progra	am. E	Executing a C Program	o Cor	nstant. Vari	ables	and	Data
types: C declar	ations. Keywords. identi	fiers.	. constants. variables.	Data	a types, ty	pe c	onver	sion.
Types of operate	ors and expressions, Input	and	output functions in C		JT	Ľ		,
Unit: II Dec	ision Making Statement	t	•				15 Ho	ours
IF-ELSE staten	ient, break, continue, g	oto,	switch () case and a	neste	d IF state	ment	. Loc	oping
Statements: For	loop, while loop, Do whi	le loo	op and nested loops. An	rrays	: Definitior	n, Init	ializa	tion,
characteristics,	One, Two, Three and	Mul	ti-dimensional Arrays	s. Sti	rings & S	tring	han	dling
Functions								
Unit: III Fun						-	<u>15 Ho</u>	ours
Introduction, Ne	ed for User-defined Fun	ictior	ns, Definition of Funct	tions,	, Return V	alues	and	their
1 ypes, Function Multiple Values	Nesting of Eurotions R		on, Calegory of Func-	Class		is th	al R	eturn
Unit: IV Str	ictures and Union	ccuis	sion, Types of Storage	Class			15 Ho	ours
Introduction de	fining a Structure. Decla	aring	Structure Variables	Acces	ssing Struc	ture	Mem	bers.
Structure Initial	ization. Copying and C	ompa	aring Structure variab	les.	Operations	on	Indiv	idual
Members, Unio	ns, Bit Fields. Pointers	– I	Introduction-Understan	ding	Pointers,	Acce	essing	g the
Address of a Va	riable, Declaring Pointer	Vari	ables, Initialization of	Poin	ter Variable	es, A	ccess	ing a
Variable through	n its Pointer							•
Unit: V File	S						15 Ho	ours
Introduction, De	fining and Opening a File	e, Clo	osing a File, Input / Ou	itput	Operations	on F	iles, l	Error
Handling during	I/O Operations, Random	Acc	ess to Files, Command	Line	e			
			Tot	al Le	ecture Hou	irs	75	
Books for study	/ <b>:</b>			7.1.1				
I. E. Balagurus	wamy, Programming in A	ANS	I C, TMH, New Delhi,	/th I	Edition, $20$	11.	( <b>F</b> 11)	
Unit I: Unit	Unit I: Chapter 1– Section: 1.1, 1.2, 1.8, Chapter 2 – Section: 2.1 to 2.11, Chapter3 (Full),							
Unit II. Cha	inter 5 (Full) Chapter 6(F	- Tull)	Chapter 7(Full) Chapt	ter 8	- Section.	8.1 te	84	8.8
Unit III: Ch	apter 9 (Full)	<i></i> ,	chapter (1 an), chap			5.1 U	,	5.0.
Unit IV: Cha	apter 10 (Full), Chapter 1	1– Se	ection: 1.1 – 11.6.					

Unit V: Chapter 12 (Full)

#### **Books for Reference:**

- 1. Kannetkar Yashavant, Let us C, BPB, New Delhi, 6th Edition, 2005.
- 2. Byron Gottfried, Programming with C, Schaum's Outlines, TMH, New Delhi, 2nd Edition, 2006.

#### Web Resources:

- 1. http://www2.its.strath.ac.uk/courses/c/
- 2. http://www.stat.cmu.edu/~hseltman/Computer.html
- 3. <u>http://www.princeton.edu/~achaney/tmve/wiki100k/docs/C\_%28programming\_language</u> %29.html

Course	e Outcome	K Level
At the	end of the course, the students will be able to	
CO1.	Able to understand the basic concepts used in computer programming and use	K)
COI	different data types in a computer program	<b>N</b> 2
<b>CO2:</b>	Able to develop, compile and debug programs in C language	K3
CO3:	Able to design programs involving decision structures, loops and functions.	K3
<b>CO4:</b>	Able to implementing pointers, structures and unions in C.	K4
<b>CO5:</b>	Able to apply file handling in C	K3

#### CO & PO Mappings:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	-	3	1	2	-
CO 2	1	2	1	2	3	-
CO 3	1	-	3	3	1	-
<b>CO 4</b>	2	2	-	3	2	-
CO5	1	2	1	2	3	-

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

# **LESSON PLAN**

UNIT	PROGRAMMING IN C	Hrs	Mode
I	Overview of C: History of C, Basic structure of C program, Executing a C Program Constant, Variables and Data types: C declarations, Keywords, identifiers, constants, variables, Data types, type conversion, Types of operators and expressions, Input and output functions in C	15	Black Board/PPT
п	Decision Making Statement: IF-ELSE statement, break, continue, goto, switch() case and nested IF statement. Looping Statements: For loop, While loop , Do while loop and nested loops. Arrays: Definition, Initialization, characteristics, One, Two, Three and Multi-dimensional Arrays. Strings & String handling Functions	15	Black Board/PPT
III	Function: Introduction, Need for User-defined Functions, Definition of Functions, Return Values and their Types, Function Calls, Function Declaration, Category of Functions, Functions that Return Multiple Values, Nesting of Functions, Recursion, Types of Storage Classes.	15	Black Board/PPT
IV	Structures and Union: Introduction, defining a Structure, Declaring Structure Variables, Accessing Structure Members, Structure Initialization, Copying and Comparing Structure Variables, Operations on Individual Members, Unions, Bit Fields. Pointers – Introduction- Understanding Pointers, Accessing the Address of a Variable, Declaring Pointer Variables, Initialization of Pointer Variables, Accessing a Variable through its Pointer	15	Black Board/PPT
v	Files: Introduction, Defining and Opening a File, Closing a File, Input/Output Operations on Files, Error Handling during I/O Operations, Random Access to Files, Command Line	15	Black Board/PPT

Course Designed by: Mr.M.Ramesh Kumar & R.Ganapathy Subramanian

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print									
	Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section		Section	I D	C	Section		
Internal	Cos	K Level	MCC	2s	Short Ans	swers	Either	D		
			No. of.	К-	No. of.	К –	or	Open		
			Questions	Level	Questions	Level	Choice	Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	<b>CO2</b>	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
		No. of								
	Que	stions to be	4		3		4	2		
		asked								
Question		No. of								
Pattern	Que	stions to be	4		3		2	1		
CIA I &	a	nswered								
II	Mar	ks for each	1		2		5	10		
	C	juestion	1				<u> </u>	10		
	Tota	l Marks for	4		6		10	10		
	eac	ch section			U		10	10		

\*Note: It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

		Dist	ribution of N	Iarks with	K Level	CIA I &	CIA II	
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	-	-	-	2	4	20
	K2	2	6	-	-	8	16	20
	K3	-	-	20	20	40	80	80
CIA	K4	-	-	-	-	-	-	-
Ι	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	50	100	100
	K1	2	-	-	-	2	4	20
	K2	2	6	-	-	8	16	20
СТА	K3	-	-	10	10	20	40	40
	K4	-	-	10	10	20	40	40
ш	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	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

5	Summat	tive Examinat	tion – Blue Pr	int Articu	lation Ma	pping – K	Level with Co	ourse
			0	outcomes (	(COs)			
			MCQs		Short A	Inswers	Section C	Section
S.No	COs	K - Level	No. of Questions	K – Level	No. of Questi on	K – Level	(Either / or Choice)	D (Open Choice)
1	CO1	K2	2	K1,K2	1	K1,K2	2(K2&K2)	1(K2)
2	CO2	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)
3	CO3	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)
4	CO4	K3	2	K1,K2	1	K1,K2	2(K4&K4)	1(K4)
5	CO5	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)
No.	of Ques Ask	tions to be ed	10		5		5	5
No. of Questions to be answered		tions to be ered	10		5		5	3
Marks for each question		1		2		5	10	
Total Marks for each section		10		10		25	30	
	(Figure	s in narenthe	sis denotes, a	uestions s	hould be a	sked with	the given K le	vel)

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

		Dis	tribution of	Marks with	n K Leve	1		
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5	4	10	-	19	15.83	41	
K2	5	6	10	10	31	25.83	41	
K3	-	-	20	30	50	41.67	42	
K4	-	-	10	10	20	16.67	17	
Marks	10	10	50	50	120	100	100	
NB: Hig of K lev	NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.							

Section	A (Mul	tiple Choic	e Questions)
Answer	All Qu	estions	(10x1=10 marks)
Q.No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (Sho	rt Answers)	
Answer	All Qu	estions	(5x2=10 marks)
Q.No	CO	K Level	Questions
11	CO1	K1	
12	CO2	K1	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eith	er/Or Type	
Answer	All Qu	estions	(5  x  5 = 25  marks)
Q.No	CO	K Level	Questions
16) a	CO1	K2	
16) b	CO1	K2	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K3	
20) b	CO5	K3	
NB: Hig	gher lev	el of perfor	mance of the students is to be assessed by attempting higher level of K
levels			
Section		n Choice)	(2-10, 20 - 20 - 20)
Answer O No			Overtigend
21	C01	K2	Questions
21	CO1	K2	
22	$CO_2$	KJ K2	
23	$CO_4$	KA KA	
24	C04	K2	
23	CUS	СЛ	

# **Summative Examinations - Question Paper – Format**



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Cou	Course Name PROGRAMMING IN C LAB							
Cou	rse Code	21UCACP1	L	Р	С			
Cat	egory	Core Lab	-	4	4			
Natu	re of course	EMPLOYABILITY SKILL ORIENTED / ENTREF	PREN	EURS	HIP			
Cou	rse Objecti	ves:						
• T	o learn com	puter programming using the C programming language						
• T	o learn the l	basic programming constructs, so that they can easily switch	over	0				
• T	o describe a	nd employ strategies that are useful in debugging						
• T	o develop lo	ogics this will help them to create programs, applications in C	2.					
• T	o analyze p	rogramming problems to choose when regular loops should b	be use	d and				
SIN	Jo	List of Programs		н	Irs			
1	To find so	quare root of nos. without using built in function.						
2	To revers	e digits of a number.						
3	To revers	e the given string.						
4	To check	if a number is Prime or not.						
5	To excha	nge the values of two variables using function.						
6	To find a	Solution of a Quadratic Equation.						
7	To find a	Sum of Series (sine, cosine).						
8	To find A	scending and descending order of numbers using Arrays (Us	se it to	)				
9	Tind Large	orting of names in Alphabetical order.						
10	Matrix or	perations (Addition, Subtraction, Multiplication, Transpose u	sing		60			
	functions	).	U					
11	Finding fa	actorials using recursive functions.						
12	Generatin	g Fibonacci Numbers using recursive functions.						
13	String ma comparise strings).	String manipulations without using string functions (string Length, string comparison, string copy, palindrome checking, counting words and lines in strings)						
14	Prepare an address book using Structure.							
15	5 To add two numbers using pointer.							
16	To illustra	ate the use of bitwise operators.						
17	To demor	nstrate the use of command line arguments.						

18	To read character from one text file and convert into upper case and write in another file.	
19	To prepare student mark sheet using file.	
20	To prepare payroll system using file.	
Web 1	Resources:	
https:	//www.youtube.com/watch?v=Ln-L9IjQK_k	
https:	//www.slideserve.com/svea/lab-1-introduction-to-c-programming	
COUI	RSE OUTCOME	K Level
At the	end of the course, the student will be able to	
CO1:	Defining compiling and debugging of programs in C language	K1

**CO2:** Executing and Implementing programs that use calculations and selections.

Executing and Implementing programs that use arrays and character

Executing and Implementing programs that use functions, pointers,

**CO3**:

**CO4:** 

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	-	3	2	3	-
CO 2	3	-	3	2	3	-
CO 3	3	-	3	2	3	-
CO 4	3	-	3	2	3	-
CO5	3	-	3	2	3	-

strings and that use functions for character strings

**CO5:** Executing and Implementing programs using file handling in C.

structures and unions in C

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

**K3** 

K3

K3

**K3** 

Sl.No	List of Programs	Hrs.	Mode				
1	To find square root of nos. without using built in function.						
2	To reverse digits of a number.						
3	To reverse the given string.						
4	To check if a number is Prime or not.						
5	To exchange the values of two variables using function.						
6	To find a Solution of a Quadratic Equation.						
7	To find a Sum of Series (sine, cosine).						
8	To find Ascending and descending order of numbers using Arrays (Use it to find Largest and Smallest Number).						
9	To find Sorting of names in Alphabetical order.						
10	Matrix operations (Addition, Subtraction, Multiplication, Transpose using functions).						
11	Finding factorials using recursive functions.	60	&				
12	Generating Fibonacci Numbers using recursive functions.		РРТ				
13	String manipulations without using string functions (string Length, string comparison, string copy, palindrome checking, counting words and lines in strings).						
14	Prepare an address book using Structure.						
15	To add two numbers using pointer.						
16	To illustrate the use of bitwise operators.						
17	To demonstrate the use of command line arguments.						
18	To read character from one text file and convert into upper case and write in another file.						
19	To prepare student mark sheet using file.						
20	To prepare payroll system using file.						

#### Lesson Plan

Course Designed by: Mr.M.Ramesh Kumar & R. Ganapathy Subramanian



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	Mathematical Foundat	Aathematical Foundations					
Course Code	21UMCA11			L	Р	С	
Category	Allied			5	-	4	
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENE	URSI	HIP	~	
Course Object	ves:		<b>i</b>				
• To understa	nd the rank of a matrix an	nd apply it to solving syst	em of linear equation	ons.			
• To analyze	Eigen values and associate	ed Eigen vectors of a ma	trix.				
• To study the	methods of reasoning, w	which includes algebra of	propositions, such a	is con	npour	nd	
proposition	, truth tables, and tautolog	gies	1 1 6				
• To write an	interpret mathematical n	notation and mathematica	al definitions			1	
• To acquire	basic idea of graph, vario	ous terms associated and	matrix representation	ons of	grap	ohs,	
Unit: I Ma	triv Algobro				15		
Introduction - N	latrix operations – Inverse	e of a Square Matrix – F	lementary operation	is and	Ran	k of	
a Matrix – Sim	ltaneous L inear Equation	e of a square matrix – E	iementary operation	is and	Nam	K UI	
Unit: II Ma	trix Algebra				15		
Inverse by Part	ioning – Eigen values ar	nd Eigen vectors( Problem	ms only)				
Unit: III Lo	ic	6	<i>J</i> /		15		
Introduction –	F-statements – Connect	ives – Atomic and com	pound statements –	Well	For	ned	
(Statement) Fo	mulae – Truth table of	a Formula – Tautology	– Tautological Im	plicat	ions	and	
Equivalence of	Formulae						
Unit: IV La	tices and Boolean Algeb	ora			15		
Lattices – Som	properties of Lattices – I	New Lattices – Modular	and Distributive Lat	ttices			
Unit: V Cr	nh Theory	ais – Karnaugii Grapiis (i	Problems only).		15		
Basic concepts	- Matrix Representation of	of Granhs _ Trees _ Snan	ning Trees _ Shorte	ct Pat	15 h		
Problem (Probl	ms only).	n oraphs rrees opan	ling frees bhorte	si i ai	11		
	ino omy).		Total Lecture Ho	urs	75 H	rs	
Books for Stud	v:						
Dr MK	Venkataraman N Sridhar	an and N Chandraseka	ran "Discrete Ma	them	atics	,	
The National P	blishing Company Chen	nai 2006		unun	atics	,	
The Puttonal P	onshing company, chen	indi, 2000.					
Unit I -	Chapter 6: Pages : 6.1	1- 6.31					
Unit II ·	- Chapter 6: Pages : 6.31- 6.44						
Unit III ·	Chapter 9: Pages : 9.1 – 9.34						
Unit IV -	nit IV - Chapter10: Pages :10.1 – 10.70						
Unit V - Chapter11: Pages : 11.1 – 11.81							
Books for Refe	rences:						
1. Trembley. J	P. and Manohar.R., 2001	, Discrete Mathematical	Structures with A	pplic	ations	s to	
2 Source T	ce, 1 ata McGraw –Hill Pub	Linson 2002 Discuster	/ Delhi.	Mar	*0.111	LI:11	
2. Seymour I	ipsenutz and Marc Lars	Lipson, 2002, <b>Discrete</b>	viatinematics, 1 ata	MCG	Taw	пШ	

Publis	shing Company Ltd. New Delhi.		
Web F	lesources:		
•	https://nptel.ac.in/courses/106/106/106106094/		
•	https://nptel.ac.in/courses/111/107/111107058/		
•	https://nptel.ac.in/courses/111/106/111106086/		
•	https://nptel.ac.in/noc/courses/noc18/SEM2/noc18-cs53/		
Course Outcomes			
On the	successful completion of the course, the students will be able to		
CO1.	apply the matrix theory to study other branches of mathematics like algebra,	V1	
COI:	vector analysis, cryptography, graph theory etc	N1	
	apply the matrix theory to analyze the quantitative and qualitative properties		
<b>CO2:</b>	of solutions of mathematical models in biological, ecological systems and in	K1	
	engineering problems		
CO3:	be conversant with the rules of logic to understand and reason with statements	К3	
CO4:	Formulate and interpret Boolean logic principles.	К3	
CO5:	have a strong background of graph theory	K3	

## CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	3	2	3	-
CO 2	2	3	3	3	2	-
CO 3	3	2	2	2	3	-
<b>CO 4</b>	3	2	2	3	3	-
CO5	3	2	3	3	3	-

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

UNIT	COURSE NAME	Hrs	Mode
I	Introduction - Matrix operations – Inverse of a Square Matrix – Elementary operations and Rank of a Matrix – Simultaneous Linear Equations.	12	Chalk & Talk, LCD Projector
II	Inverse by Partitioning – Eigen values and Eigen vectors (Problems only)	12	Chalk & Talk
ш	Introduction – TF-statements – Connectives – Atomic and compound statements – Well Formed (Statement) Formulae – Truth table of a Formula – Tautology – Tautological Implications and Equivalence of Formulae	12	Chalk & Talk
IV	Lattices – Some properties of Lattices – New Lattices – Modular and Distributive Lattices – Boolean Algebras – Boolean Polynomials – Karnaugh Graphs (Problems only).	12	Chalk & Talk, LCD Projector
v	Basic concepts – Matrix Representation of Graphs – Trees – Spanning Trees – Shortest Path Problem (Problems only).	12	Chalk & Talk, Assignment

Course Designed by: Mr. P. Palanikumar& Dr. S. Suriyakala

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
				Section	n A	Section	n B		Section	
Interna	0			MCQ	)s	Short An	swers	Section C	Section D	
l	C	OS	K Level	No. of. Question s	K - Level	No. of. Question s	K – Level	Either or Choice	Open Choice	
CI	C	01	Up to K3	2	K1,K2	1	K1	2 (K2)	1 K3	
AI	AI CO2		Up to K4	2	K1,K2	2	K2	2(K3&K3)	1 (K4)	
CI	CI CO3		Up to K4	2	K1,K2	1	K1	2 (K2)	1 (K3)	
AII CO		04	Up to K4	2	K1,K2	2	K2	2 (K3)	1 (K4)	
Question Pattern		No. of Questions to be asked		4		3		4	2	
		No. of Questions to be answered		4		3		2	1	
CIA I & II Marks for each question		rks for each question	1		2		5	10		
Total Marks for each section		4		6		10	10			

\*Note: It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

	Distribution of Marks with K Level CIA I & CIA II								
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10	-	16	32	40	
	K3	-	-	10	10	10	20	40	
CIA I	K4	-	-	-	10	10	10	20	
	K5	-	-	-		-	-	-	
	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10	-	16	32	40	
	K3	-	-	10	10	10	20	40	
CIA II	K4	-	-	_	10	10	10	20	
	K5	-	-	_		-	_	-	
	Marks	4	6	20	20	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

S	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)							
S.No	COs	K - Level	MO( No. of Questions	)s K – Level	Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)
1	CO 1	K3	2	K1	1	K1	2 (K3& K3)	1 (K2)
2	CO 2	K3	2	K1	1	K1	2 (K3 &K3)	1 (K3)
3	CO 3	K3	2	K1&K2	1	K2	2 (K3 &K4)	1 (K3)
4	CO 4	K4	2	K1&K2	1	K2	2 (K3 &K4)	1 (K3)
5	CO 5	K4	2	K1&K2	1	K2	2 (K3 &K4)	1 (K4)
No. of Questions to be Asked		ions to be ed	10		5		5	5
No.of Questions to be answered		10		5		5	3	
Marks for each question		1		2		5	10	
Total Marks for each section		10		10		25	30	
	(Figures in parenthesis denotes, questions should be asked with the given K level)							

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

	Distribution of Marks with K Level									
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %			
K1	5	6	10	-	19	15.83	12			
K2	5	4	10	10	31	25.83	72			
K3	-	-	20	30	50	41.67	42			
K4	-	-	10	10	20	16.67	16			
Marks	10	10	50	50	120	100	100			
NB: Hig	NB: Higher level of performance of the students is to be assessed by attempting higher level									

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

Section	ı A (Mu	iltiple Cho	ice Questions)				
Answe	r All Q	uestions	(10x1=10 marks)				
Q.No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K1					
3	CO2	K1					
4	CO2	K1					
5	CO3	K3					
6	CO3	K3					
7	CO4	K3					
8	CO4	K3					
9	CO5	K3					
10	CO5	K3					
Section	B (She	ort Answer	·s)				
Answe	r All Q	uestions	(5x2=10 marks)				
Q.No	CO	K Level	Questions				
11	CO1	K1					
12	CO2	K1					
13	CO3	K3					
14	CO4	K3					
15	CO5	K3					
Section	C (Eit	her/Or Ty	pe)				
Answe	r All Q	uestions	(5  x 5 = 25  marks)				
Q.No	CO	K Level	Questions				
16) a	CO1	K1					
16) b	CO1	K1					
17) a	CO2	K1					
17) b	CO2	K1					
18) a	CO3	K3					
18) b	CO3	K3					
19) a	CO4	K3					
19) b	CO4	K3					
20) a	CO5	K3					
20) b	CO5	K3					
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher				
level of K levels							
Section	D (Op	en Choice)					
Answe	r Any 'l	Three ques	tions (3x10=30 marks)				
Q.No	CO	K Level	Questions				
21	COI	Kl					
22	CO2	KI					
23	<u>CO3</u>	K3					
24	CO4	K3					
1 25	I ('()5	K3					

# **Summative Examinations - Question Paper – Format**



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	ame INTERNET BASICS LAB										
Course Code	21UITSP1					L	Р	С			
Category	Skill Lab					-	2	2			
Nature of con	Irse:EMPLOYABILITY	< ✓	SKILL ORIENTED	~	ENTREPF	RENE	URSI	HIP			
Course Objectives:											
To pro	vide complete knowledge	of I	nternet basics								
To lea	rn the concept of static we	eb pa	.ge .								
To kno	w the usage of Markup la	ingu	ages with scripting.								
To une	lerstand the working prine	ciple	behind the website.								
To lea	in the concepts of chatting	g and	l network components in	futı	ıre.						
S. No.		Lis	t of Programs				Hou	rs			
<b>1.</b> I	Describe the stages of cre	ate e	-mail id on yahoo web s	site,	how will yo	ou					
<b>2.</b> s	end and receive e mail.										
I	Describe the chatting com	pone	nts on the internet								
<b>3.</b> I	Describe the use and func	tion	of the following (a) telr	net (	b) TCP/IP (	c)					
	ITTP.										
	Freate your first web page	usin	g notepad in HTML.		1 4						
5.	reate your login webpage	e ior	your conege website or (	com	pany website	e.	20				
0.	reate the web page with t	he ro	bliowing constraints				30				
	a) all image off the we	opag	c. absite								
	c) a table of marks of I	ge we T els	cusiic								
7 5	bow blinking effect on w	eh n	age using java script								
8. I	Design a digital clock on y	$\frac{00}{00}$	web page using java scri	nt.							
9. I	Design a digital calculator	usin	g HTML and java Script	<b>P</b> ••							
10. I	Design the web site on your college										
7	Total Lecture Hours										
Course Outcomes :							K Le	vel			
At the end of	he Course the student will	l be	able to								
CO1:Understand, create email id, sending and receiving emails.K							K3				
CO2:Apply and design Web Page using HTML and Java script.K2											
CO3: Famil	iarize with Web page des	ign u	sing HTML / DHTML.				K3				
CO4: Creat	e a Web site using text, in	nages	s, links, lists.				K4				
CO5: Demo	nstrate simple application	is pro	ograms using HTML cor	ntrol	8		K4				

#### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	-	-	2	2	-
CO 2	-	-	2	3	3	-
CO 3	3	3	3	3	2	-
<b>CO 4</b>	3	3	2	-	2	3
CO5	1	3	3	3	-	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

## LESSON PLAN

S. No.	List of Programs	Hours	Mode
1.	Describe the stages of create e-mail id on yahoo web site, how		
2.	will you send and receive e mail.		
	Describe the chatting components on the internet		
3.	Describe the use and function of the following (a) telnet (b)		
	TCP/IP (c) HTTP.		
4.	Create your first web page using notepad in HTML.		
5.	Create your login webpage for your college website or company		
6.	website.	30	Laboratory
	Create the web page with the following constraints	30	Experiments
	a) an image on the webpage.		•
	b) a hyperlink to college website		
7.	c) a table of marks of IT class students.		
8.	Show blinking effect on web page using java script.		
9.	Design a digital clock on your web page using java script.		
10.	Design a digital calculator using HTML and java Script.		
	Design the web site on your college		

Course Designed by: Ms. T. Thivya Sindhu & Mrs. R.K. Vijayalakshmi





MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name OBJECT ORIENTED PROGRAMMING WITH- C++									
Course Code 21UITC21	L	Р	C						
Category Core	5	-	5						
Nature of course:EMPLOYABILITYImage: Skill ORIENTEDImage: Skill ORIENTEDImage: Skill ORIENTED	ENE	URS	HIP						
Course Objectives:									
• To understand how C++ improves C with object-oriented features.									
• To learn how to write inline functions for efficiency and performance.									
• To learn the syntax and semantics of the C++ programming language.									
• To learn how to design C++ classes for code reuse.									
To implement the object oriented Paradigm.									
Unit: I Principles of OOP :			15						
Object Oriented Programming Paradigm- Basic concepts of OOP-Benefits of OOP. I	Begin	ning	with						
C++: What is C++ - A simple C++ program-Structure of C++ Program -Toke	ens-K	Leywo	ords-						
Identifiers and Constants-Basic data types-User defined data types – Derived data	a typ	es-sto	rage						
classes- type compatibility-Declaration of variables-Scope resolution operator-	- ma	nipul	ator-						
Expression and their types-Control structures.									
Unit: II Functions in C++:			15						
The Main function-function prototyping-Call by reference-return by reference-In	line	tunct	ions-						
Recursion- Function Overloading- Default Arguments-Function Overloading. Clas	s and	i Obj	ects:						
Introduction-specifying a Class-Defining member function-Nesting of member function-	nctio	$n - A_1$	rays						
within a class-Memory allocation for objects-static data members and member func-	ctions	-Arra	iy of						
Unit: III Constructors and Destructors:			15						
Introduction Constructors Parameterized constructor Constructor with default argun	oonte	Dun	15 amic						
initialization of objects-Conv constructor-Dynamic constructor-constructor tw	o di	-Dyna mensi	onal						
arrays-Destructor Operator Overloading: Defining operator overloading-Overl	loadi	no 11	narv						
operators-Overloading binary operators- Rules for overloading operators	Ioaun	herita	nce.						
Introduction-Single-Multilevel-Multiple-Hierarchical-Hybrid inheritance-virtual base	e clas	s	ince.						
Unit: IV Templates:	<b>e</b> ius		15						
Introduction-Class templates-Class template with multiple parameters-function tem	plate	s-fund	ction						
template with multiple parameters –overloading of template functions-member func-	ction	temp	late-						
non-type template arguments. Exception Handling: Introduction - basics of exception	otion	hand	ling-						
exception handling mechanism-catching mechanism-rethrowing an exception.	Ma	nipula	ating						
strings: Introduction (string) objects-manipulating string objects-relational operations-comparing									
and swapping.									
Unit: V I/O Operations:			15						
Managing console I/O operations: Introduction-C++ streams- C++ stream classes-up	nforr	nattec	l I/O						
operations-formatted console I/O operations-output manipulators. Working with files	s: Inti	oduc	tion:						
classes for file stream operations-opening and closing a file-detecting EOF()	- fil	e mo	odes-						
sequential i/o operations-random access-command line arguments.									
Total Lecture Hours			75						
Books for study:									

1. E.I	Balagurusamy Object Oriented Programming with C++ McGraw Hill Education	n (Private)						
I. L.i.	Limited 6th Edition New Delhi 2014							
LIni	t 1: Chapter 1.2 & 2							
	t 1. Chapter 1, 2 & 3							
Uni	t 2: Chapter 3 & 4							
Uni	t 3: Chapter 5,6 & 7							
Uni	t 4: Chapter 12,13 & 14							
Uni	t 5: Chapter 10 & 11							
Books	for References:							
<b>1.</b> Str	oustrup, The C++ Programming Language, 4th Edition. AddisionWesley. May 20	13.						
<b>2.</b> He	rbert Schildt C++ - The Complete Reference ,4th Edition, McGraw Hill. July 2017							
Web F	Resources:							
1. <u>htt</u>	p://www.lmpt.univ-tours.fr/~volkov/C++.pdf							
2. htt	ps://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf							
Cours	e Outcomes:	K Level						
At the	end of the Course the student will be able to							
CO1.	Define various data types, use them in simple data processing applications,	W2						
COI	bject oriented concepts for solving scientific and mathematical problems.							
<b>CO2:</b>	Understand of object oriented programming concepts in real time problems.	K3						
CO3:	Implement the concept of overloading, inheritance, exception handling.	K3						
CO4:	Find the advantages of OOPs over Procedural Languages	K4						
~~-	Develop Application of C++ program skills in real time project and develop	<b>T</b> 7 4						
11115-	confidence to update the C++ language for life time.							

# CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO 1	1	3	3	-	2	-
CO 2	2	-	3	2	3	-
CO 3	2	2	2	3	-	-
CO 4	2	2	3	3	3	2
CO5	-	2	2	3	3	3

\*3 –Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

LESSON	<b>PLAN</b>

UNIT	<b>Object Oriented Programming- C++</b>	Hrs	Pedagogy
I	Principles of OOP : Object Oriented Programming Paradigm- Basic concepts of OOP-Benefits of OOP. Beginning with C++: What is C++ - A simple C++ program-Structure of C++ Program -Tokens-Keywords-Identifiers and Constants-Basic data types-User defined data types – Derived data types-storage classes- type compatibility-Declaration of variables-Scope resolution operator- manipulator-Expression and their types-Control structures.	15	Chalk & Talk, ICT Kit
Π	Functions in C++: The Main function-function prototyping-Call by reference-return by reference-Inline functions-Recursion- Function Overloading- Default Arguments-Function Overloading. Class and Objects: Introduction-specifying a Class-Defining member function- Nesting of member function- Arrays within a class-Memory allocation for objects-Static data members and member functions-Array of objects- Friendly functions-returning objects-const member functions.	15	Chalk & Talk, ICT Kit
III	Constructors and Destructors: Introduction-Constructors- Parameterized constructor-Constructor with default arguments-Dynamic initialization of objects-Copy constructor-Dynamic constructor-constructing two dimensional arrays-Destructor. Operator Overloading: Defining operator overloading-Overloading unary operators-Overloading binary operators- Rules for overloading operators. Inheritance: Introduction-Single- Multilevel-Multiple-Hierarchical-Hybrid inheritance-virtual base class	15	Chalk & Talk, ICT Kit
IV	Templates: Introduction-Class templates-Class template with multiple parameters-function templates-function template with multiple parameters –overloading of template functions-member function template-non-type template arguments. Exception Handling: Introduction - basics of exception handling- exception handling mechanism-catching mechanism-rethrowing an exception. Manipulating strings: Introduction (string) objects-manipulating string objects-relational operations- comparing and swapping.	15	Chalk & Talk, ICT Kit
V	Managing console I/O operations: Introduction-C++ streams- C++ stream classes-unformatted I/O operations-formatted console I/O operations-output manipulators. Working with files: Introduction: classes for file stream operations-opening and closing a file-detecting EOF() - file modes-sequential i/o operations-random access-command line arguments.	15	Chalk & Talk, ICT Kit

Course Designed by: Mrs.R.Vanitha & Mr.P.Ganeshbabu

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print											
	Articulation Mapping – K Levels with Course Outcomes (COs)										
					Section	h A	Section	n B	Seation C	Section D	
Intornal	C	<b>'00</b> '	K L ovol		MCQ	s	Short An	swers	Section C	Section D	
memai	C	<i>.</i> U5	K Levei	Q	No. of. Questions	K – Level	No. of. Questions	K - Level	Choice	Choice	
	С	01	K3	2		K1,K2	1	K2	2(K3,K3)	1(K3)	
CIAI	С	02	К3		2	K1,K2	2	K2	2(K3,K3)	1(K3)	
СТАП	С	03	K3	2		K1,K2	1	K2	2(K3,K3)	1(K3)	
	<b>CO4</b>		K4	2		K1,K2	2	K2	2(K4,K4)	1(K4)	
		No. of Questions be asked No. of Questions be answered		0	4		3		4	2	
Question Pattern				<sup>.0</sup> 4			3		2	1	
CIA I & I	Π	Ν	Marks for each question		1		2		5	10	
		Total Marks for each section			4		6		10	10	

	Distribution of Marks with K Level CIA I & CIA II										
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %			
	K1	2	2	-	-	4	8	20			
	K2	2	4	-	-	6	12	20			
СІА	K3	-	-	20	20	40	80	80			
I	K4	-	-	-	-	-	-	-			
	Marks	4	6	20	10	50	100	100			
	K1	2	2	-	-	4	8	20			
CIA II	K2	2	4	-	-	6	12	-0			
	K3	-	-	10	10	20	40	40			
	K4	-	-	10	10	20	40	40			
	Marks	4	6	20	20	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.
Sumn	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes									
	(COs)									
			MCC	)s	Short Ar	iswers	Section C	Section D		
S.No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	(Open Choice)		
1	CO1	К3	2	K1&K2	1	K1	2 (K3& K3)	1 (K3)		
2	CO2	K3	2	K1&K2	1	K1	2 (K3 &K3)	1 (K3)		
3	CO3	K3	2	K1&K2	1	K2	2 (K3 &K3)	1 (K3)		
4	CO4	K4	2	K1&K2	1	K2	2 (K4 &K4)	1 (K4)		
5	CO5	K4	2	K1&K2	1	K2	2 (K4 &K4)	1 (K4)		
No	of Quest. Aske	ions to be ed	10		5		10	5		
No.of Questions to be answered		10		5		5	3			
Marks for each question		1		2		5	10			
Total Marks for each section			10		10		25	30		
	(Figures	in parenthes	is denotes, q	uestions	should be as	ked with	the given K	level)		

# Distribution of Marks with K Level

K Levels	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5	6	10	-	19	15.83	12
K2	5	4	10	10	31	25.83	42
K3	-	-	20	30	50	41.67	42
K4	-	-	10	10	20	16.67	16
Marks	10	10	50	50	120	100	100

Section	A (Mu	ıltiple Cho	ice Questions)
Answe	r All Q	uestions	(10x1=10 marks)
Q.No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answer	rs)
Answe	r All Q	uestions	(5x2=10 marks)
Q.No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answe	r All Q	uestions	(5 x 5 = 25 marks)
Q.No	CO	K Level	Questions
16) a	CO1	K3	
16) b	CO1	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	CO5	K4	
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher
level of	K leve	ls	
Section	D (Op	en Choice	
Answe	r Any T	Three ques	tions (3x10=30 marks)
Q.No	CO	K Level	Questions
21	CO1	K3	
22	CO2	K3	
23	CO3	K3	
24	CO4	K4	
25	CO5	K4	

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	OBJECT ORIENTED PROGRAMMING WITH C++ LAB						
Course Code	21UITCP2	L	Р	С			
Category	Core Lab	-	4	4			
Nature of cou	Irse: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPI	RENE	EURS	SHIP			
Course Object	ctives:						
• To underst	tand how C++ improves C with object-oriented features.						
• To learn h	ow to write inline functions for efficiency and performance.						
• To learn th	ne syntax and semantics of the C++ programming language.						
• To learn h	ow to design C++ classes for code reuse.						
• To implem	nent the concept of OOPs.						
_							
S. No.	List of Programs		Ho	urs			
1.	Conversion of Fahrenheit and Celsius using class.						
2.	Calculate multiplication and division using inline function.						
3.	Perform area calculation the function overloading						
4.	Print the employee details using Arrays of object.						
5.	Swapping of two numbers using friend function.						
6.	Change the sign using overloading unary minus						
7.	Overload binary + operator this adds two complex numbers.						
8.	Calculate BMI using single inheritance						
9.	Generate salary bill using multiple inheritance.						
10.	Calculate square and cube of a number using hierarchical inheritance.						
11.	Process Student Mark list Multilevel inheritance.		6	50			
12.	Print the Student Mark list using Virtual Base class.						
13.	Sort N numbers using Bubble Sort.						
14.	Search an element using Linear Search						
15.	Search an element using Binary Search.						
16.	Perform stack operations using Array.						
17.	Perform stack operations using Linked List.						
18.	Print Fibonacci series using Recursion.						
19.	Perform queue operations using Array.						
20.	Traversal of Tree						
				0			
	Total Lecture Ho	urs	Ċ	U			

Course Outcomes						
At the end of the Course the students will be able to						
CO1:	Understand the concept of class, member function and member variable.					
<b>CO2:</b>	Understand the difference between the top-down and bottom-up approach	K3				
CO3:	Categorize the inheritance types and polymorphism	K3				
CO4:	Apply and analyze Exception handling.	K4				
CO5:	Test the templates concept of OOP.	K4				

# CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	-	-	2	2	-
CO 2	-	-	2	3	3	-
CO 3	3	3	3	3	2	-
<b>CO 4</b>	3	3	2	-	2	3
CO5	1	3	3	3		3

\*3 – Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

# LESSON PLAN

S. No.	List of Programs	Hrs	Pedagogy
1.	Conversion of Fahrenheit and Celsius using class.		
2.	Calculate multiplication and division using inline function.		
3.	Perform area calculation the function overloading		
4.	Print the employee details using Arrays of object.		
5.	Swapping of two numbers using friend function.		
6.	Change the sign using overloading unary minus		
7.	Overload binary + operator this adds two complex numbers.		
8.	Calculate BMI using single inheritance		
9.	Generate salary bill using multiple inheritance.		
10.	Calculate square and cube of a number using hierarchical		Laboratory
	inheritance.	60	Laboratory Exportmonts
11.	Process Student Mark list Multilevel inheritance.		Experiments
12.	Print the Student Mark list using Virtual Base class.		
13.	Sort N numbers using Bubble Sort.		
14.	Search an element using Linear Search		
15.	Search an element using Binary Search.		
16.	Perform stack operations using Array.		
17.	Perform stack operations using Linked List.		
18.	Print Fibonacci series using Recursion.		
19.	Perform queue operations using Array.		
20.	Traversal of Tree		

Course Designed by: Mrs.R.Vanitha & Mr.P.Ganeshbabu



MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION	N					
Course Code	21UELA21	L	Р	С			
Category	Allied	5	-	4			
Nature of cours	se: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPR	RENE	URSI	HIP			
Course Objecti	ves:						
• To understat	nd the basics of number system and gates.						
• To learn how	v to work on combinatorial Logic.						
• To learn the	Arithmetic Circuits and Flip-Flops.						
• To learn the	types of Registers.						
To impleme	nt the instruction codes.						
Unit: I Nui	mber Systems and Codes:			15			
Binary Number	system - Binary to decimal - decimal to binary - hexa decimal -	ASC	II				
code – Excess-3	Code – Gray code.						
<b>Digital Logic:</b>	The Basic Gates – NOT, OR, AND - Universal Logic Gates – N	OR,					
Unit: II Cor	nbinatorial Logic Circuits:			15			
Boolean Laws a	nd Theorems, - Sum of Products method - Truth table to Karnaugh	Map		10			
Pairs, Ouads, O	ctets – Don't Care Conditions- Product-of sums method -Product-o	of sum	ns				
Simplifications.							
Data Processin	g Circuits: Multiplexers – Demultiplexers-1-of-16 Decoder – BC	CD-to	- dec	imal			
Decoders - Sev	en-segment Decoders – Encoders – Exclusive- OR Gates- Parity	Gener	ators	and			
Checkers							
Unit: III Ari	thmetic Circuits:			15			
Binary Additio	n- Binary Subtraction - 2'S Complement Representation - 2	2's					
Complement Ar	ithmetic – Arithmetic Building Blocks- Adder- Subtractor						
Flip-Flops-RS	Flip-Flops-Gated Filp-Flops-Edge-triggered RS Flip-Flops-Edg	ge-					
triggered D Flip	-flopsEdge-triggered JK Flip-Flops-JK Master Slave Flip-flops.						
Unit: IV Typ	bes of Registers			15			
Serial In-Serial	Out – Serial In-Parallel Out – Parallel In- Parallel Out – Ring Cour	nter –					
Ripple Counter	– Synchronous Counter.						
Unit: V Inst	truction Codes			15			
Computer Regis	ter – Computer Instructions – Timing And Control – Instruction Cyc	ele.					
Control Memor	y – Address Sequencing – General Register Organization – S	Stack					
Organization –	Instruction Formats – Data Transfer and Manipulations -Addre	ssing					
Modes – Program Control.							
	al Lecture Hours			/5			
BOOKS IOF Stud	y: sialso and Amplications - Danold D Loosh Albert Davi Makring Co		Calco	oth			
1. Digital Print	Crow Lill Educations – Donaid P Leach, Albert Paul Malvino, Go	Julam	Sana	l, 8 <sup></sup>			
2 Computer S	Olaw-fill Education, 5° repfill 2015.	2001	7				
2. Computer S	ystem Architecture, W. Worns Warlo, realson Education, $5^{-1}$ Educities INIT I $\rightarrow$ Text Book 1 (Chapters 5) (5.1 to 5.0) and 2) (2.1 to 2.2)	- 200	/				
T	INIT I $\therefore$ Text Book 1 : Chapters 3: (3.1 to 3.8) and 4: (4.1 to 4.7) INIT II $\therefore$ Text Book 1 : Chapters 3: (3.1 to 3.8) and 4: (4.1 to 4.7)						
UNIT II : Text Book I : Chapters 3: $(3.1 \text{ to } 3.8)$ and 4: $(4.1 \text{ to } 4.7)$							

	UNIT III : Text Book 1 : Chapters 6: (6.1 to 6.8) and 8: (8.1 to 8.5,8.8)					
	UNIT IV : Text Book 1 : Chapters 9: (9.1 to 9.6) and 10: (10.1,10.3)					
	UNIT V : Text Book 2 : Chapter 5:(5.1 to 5.5) ,7:(7.1,7.2) and Chapter 5:(5.1 to 5.5) ,7:(7.1,7.2)	pter 8 (8.1				
to8.7)						
Books	for References:					
1. Dig	gital Design, R.Anantha Natarajan, PHI Learning, 2015.					
2. Pri	nciples of Digital Electronics, K.Meena, PHI Learning, 2013.					
3. Dig	gital Computer Fundamentals, Thomas C. Bartee TMH 2007.					
Web R	Resources:					
1. ht	tps://soaneemrana.org/onewebmedia/DIGITAL%20PRINCIPLES%20AND%	620APPL				
IC	ATION%20BY%20LEACH%20&%20MALVINO.pdf					
2. ht	tps://www.javatpoint.com/digital-computers					
Course	e Outcomes	K Level				
CO1:	Understand the basics of number system and logic gates	K3				
<b>CO2:</b>	Understand combinatorial logic circuits and implementation of circuits	K3				
CO3:	Analyze the concept of Arithmetic circuits and Flip Flops.	K4				
CO4:	Relate the ideas of types of registers	K3				
CO5:	Analyze the use of Instruction codes, Addressing modes and program controls	K4				

# CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	1	3	3	-	2	-
CO 2	2	-	3	2	3	-
CO 3	2	2	2	3	-	-
<b>CO 4</b>	2	2	3	3	3	2
CO 5	-	2	2	3	3	3

\*3 –Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

### **LESSON PLAN**

UNIT	Digital Principles And Computer Organization	Hrs	Pedagogy
I	<ul> <li>Binary Number system – Binary to decimal – decimal to binary – hexa decimal – ASCII code – Excess-3 Code – Gray code.</li> <li>Digital Logic: The Basic Gates – NOT, OR, AND - Universal Logic Gates – NOR, NAND.</li> </ul>	15	Chalk & Talk, ICT Kit
п	Boolean Laws and Theorems Sum of Products method - Truth table to Karnaugh Map – Pairs, Quads, Octets – Don't Care Conditions- Product-of sums method -Product-of sums Simplifications. <b>Data Processing Circuits:</b> Multiplexers – Demultiplexers-1-of-16 Decoder – BCD-to- decimal Decoders – Seven-segment Decoders – Encoders – Exclusive- OR Gates- Parity Generators and Checkers	15	Chalk & Talk, ICT Kit
ш	Binary Addition- Binary Subtraction – 2'S Complement Representation - 2's Complement Arithmetic – Arithmetic Building Blocks- Adder- Subtractor <b>Flip-Flops</b> -RS Flip-Flops-Gated Filp-Flops-Edge-triggered RS Flip-Flops-Edge- triggered D Flip-flopsEdge-triggered JK Flip-Flops-JK Master Slave Flip-flops.	15	Chalk & Talk, ICT Kit
IV	Serial In-Serial Out – Serial In-Parallel Out – Parallel In- Parallel Out – Ring Counter –Ripple Counter – Synchronous Counter.	15	Chalk & Talk, ICT Kit
V	Computer Register – Computer Instructions – Timing And Control – Instruction Cycle. Control Memory – Address Sequencing – General Register Organization – Stack Organization – Instruction Formats – Data Transfer and Manipulations -Addressing Modes – Program Control.	15	Chalk & Talk, ICT Kit

Course Designed by: Mrs. R.K. Vijayalakshmi & Mrs. T. ThivyaSindhu

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print								
		Articulation M	Iapping – K	Levels wit	h Course Ou	tcomes	(COs)	1
			Section	n A	Section	B		
			MCC	)s	Short Ansv	wers	Section C	Section D
Internal	Cos	K Level	No. of. Questions	K – Level	No. of. Questions	K - Lev el	Either or Choice	Open Choice
	<b>CO1</b>	K3	2	K1&K2	1	K2	2(K3&K3)	1(K3)
CIAI	CO2	К3	2	K1&K2	2	K2	2 (K3&K3)	1(K3)
	CO3	K4	2	K1&K2	2	K2	2 (K4&K4)	1(K4)
	<b>CO4</b>	K3	2	K1&K2	1	K3	2 K3&K3)	1(K3)
Question Pattern		No. of Questions to be asked	4		3		4	2
		No. of Questions to be answered	4		3		2	1
CIATO		Marks for each question	1		2		5	10
		Total Marks for each section	4		6		10	10

**\*Note:** It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

Distribution of Marks with K Level CIA I & CIA II									
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10		16	32	40	
СІА	K3	-	-	10	10	20	40	40	
I	K4	-	-	-	10	10	20	20	
•	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10		16	32	40	
CIA	K3	-	-	10	10	20	40	40	
II	K4	-	-	-	10	10	20	20	
	Marks	4	6	20	20	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	;)			
		V	MC	Qs	Short An	swers	Section C	Section D
S.No	COs	N -	No. of	K –	No. of	K –	(Either / or	(Open
		Level	Questions	Level	Question	Level	Choice)	Choice)
1	CO1	K3	2	K1&K2	1	K1	2 (K3& K3)	1 (K3)
2	CO2	K3	2	K1&K2	1	K1	2 (K3&K3)	1 (K3)
3	CO3	K4	2	K1&K2	1	K2	2 (K4&K4)	1 (K4)
4	CO4	K3	2	K1&K2	1	K2	2 (K3&K3)	1 (K3)
5	CO5	K4	2	K1&K2	1	K2	2 (K3&K3)	1 (K4)
No. o	of Question	ons to be	10		5		10	
	Asked	1	10		3		10	3
No.c	of Questic	ons to be	10		5		5	3
	answere	ed	10		3		3	3
Marks for each question		1		2		5	10	
Total Marks for each		10		10		25	30	
section		1	10		10		25	30
	(Figures	in parentl	nesis denotes,	questions	should be as	sked wit	h the given K	evel)

# **Distribution of Marks with K Level**

K Levels	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5	6		-	11	9.17	33.34
K2	5	4	10	10	29	24.17	55.54
K3	-	-	30	30	60	50	50
K4	-	-	10	10	20	16.67	16.66
Marks	10	10	50	50	120	100	100

Section	Section A (Multiple Choice Questions)						
Answei	r All Q	uestions	(10x1=10 marks)				
Q. No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K2					
3	CO2	K1					
4	CO2	K2					
5	CO3	K1					
6	CO3	K2					
7	CO4	K1					
8	CO4	K2					
9	CO5	K1					
10	CO5	K2					
Section	B (She	ort Answer	rs)				
Answei	r All Q	uestions	(5x2=10 marks)				
Q. No	CO	K Level	Questions				
11	CO1	K2					
12	CO2	K2					
13	CO3	K2					
14	CO4	K2					
15	CO5	K2					
Section	C (Eit	her/Or Ty	pe)				
Answei	r All Q	uestions	(5 x 5 = 25 marks)				
Q. No	CO	K Level	Questions				
16) a	CO1	K3					
16) b	CO1	K3					
17) a	CO2	K3					
17) b	CO2	K3					
18) a	CO3	K4					
18) b	CO3	K4					
19) a	CO4	K3					
19) b	CO4	K3					
20) a	CO5	K4					
20) b	CO5	K4					
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher				
level of	K leve	els					
Section	D (Op	en Choice					
Answei	Answer Any Three questions(3x10=30 marks)						
Q. No	CO	K Level	Questions				
21	COI	K3					
22	CO2	K3					
23	CO3	K4					
24	CO4	K3					
25	CO5	K4					

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course	Course Name PC SOFTWARE LAB							
Course	e Code	21UITSP2	L	Р	С			
Catego	ory	Skilled Lab	-	2	2			
Nature	e of cour	rse: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPREN	EURS	SHIP	✓			
Course	e Object	ives:						
• To ]	Bring th	e creativity and enhance the learners in desktop applications						
• To l	know th	e techniques and application of the said.						
• To e	experim	ent themselves in the application.						
• To a	apply th	e concepts of the tools used.						
• To	think, c	reate, design, develop and implement office tools with a good aes	thetic	sens	se of			
desi	gning.							
S. No.	•	List of Programs		Ho	ours			
1.	C	reate and manage files and folder tree						
2.	U	Jse accessories utilities of windows OS						
3.	E	ntering and editing text in document file.						
4.	A	pply formatting features on text like bold, italics, underline, font	type,					
	C	olor and size. Apply features like bullet, numbering						
5.	C	Create documents, insert images, format tables						
6.	(	Create and manipulate tables						
7.	-	Entering and editing data in worksheet						
8.	A	Apply formula and functions in the sheet						
9.		se graphics and auto shapes in excel sheet						
10.		reate and manipulate excel charts						
11.		reate pay bills, pay slips, electricity bills using excel		3	30			
12.		rint sneet using print area						
13.		asic operations of power point, create ppt and inset and delete sides						
14.		reate project presentations, lecture presentations.						
13.		nnly basic formatting features in presentation like font font size	font					
10.		ppry basic formatting reactines in presentation like fold, fold size,	arts					
	st	vles bullet and numbering	ants,					
17.	N N	Vorking with drawing tools, applying shape or picture styles, appl	ving					
	0	biect borders, object fill, object effects.						
18.	W	Vorking with video, link to video and sound files.						
19.	C	reating hyperlinks, using action buttons.						
20.	20. Procedure to type a word and apply the effects shadow emboss							
		Total Lecture H	ours	3	30			
Course	Outco	mes		KL	<i>l</i> evel			
At the e	end of h	e Course the students will be able to						
<b>CO1:</b>	Unders	tand the concept of files and folders in a system.		K	3			
<b>CO2:</b>	Execut	e the usage of word document and its properties.		K	3			
<b>CO3:</b>	Execut	e the usage of Excel worksheet and its properties.		K	3			

<b>CO4:</b>	Understand the basics of PowerPoint.	K3
CO5:	Execute the tools in PowerPoint.	K3

#### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	PO 5	<b>PO 6</b>
CO 1	3	-	-	2	2	-
CO 2	-	-	2	3	3	-
CO 3	3	3	3	3	2	-
CO 4	3	3	2	-	2	3
CO5	1	3	3	3		3

\*3 – Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

# LESSON PLAN

Course Designed by: Mr. P. Ganesh Babu & Dr. M. Karthika





## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	JAVA PROGRAMMING							
Course Code	ode 21UCAC31 L P C							С
Category	Core					5	-	5
Nature of		1			ENTDE			CLUD
Course:	EMPLOYABILITY	×	SKILL ORIENTED	•	ENIKER	KEN.	EUK	SHIP
<b>COURSE OBJE</b>	ECTIVES:							
Discover	knowledge about bas	ic ja	va language syntax a	nd	semantics	to v	vrite	java
programs	and use concepts such	as v	ariables, data types, et	c.				
<ul> <li>Demonstr</li> </ul>	rate the fundamentals	of c	bject-oriented program	mm	ing conce	epts,	inclu	uding
objects, ii	nvoking methods, etc.							
<ul> <li>Analyze t</li> </ul>	the concepts of strings	and a	arrays.					
<ul> <li>Develop .</li> </ul>	Java program using pao	ckag	es and interface.					
• Assess th	e design controls using	app	lets and AWT controls	5.				
Unit: I Fou	indations of Java						15	hrs
Computer system	ns – Programming lang	guage	es – Stage for Java – C	Drig	in of Java	a – C	halle	enges
of Java – Java fe	eatures – Java program	n de	velopment – Object-or	rien	ted progr	amm	ing.	Java
Essentials: Elem	nents of Java program	– Ja	wa API – Variables a	nd	literals –	Prim	itive	data
types – The string	g class – Operators – O	Const	ants.					
Unit: II Con	ntrol Statement						15	hrs
The if statement	- The if-else stateme	nt –	Nested if statements -	- Tl	he if-else-	-if sta	atem	ent –
Logical operator	rs – Comparing string	g ob	jects - The condition	nal	operator	– Tł	ne s	witch
statement – Incre	ement and decrement	opera	ators – while loop – I	)0-v	while loop	p – F	or lo	oop –
nested loops - B	Break and continue star	teme	nts. Classes and Obj	ects	: Classes	and	obje	ects –
Modifiers – Pass	sing arguments - Cons	struct	tors – Packages and ir	npo	rt statem	ents -	– Fii	nding
the classes and	their responsibilities	– S	static class members	_	Overload	ed m	etho	ods –
Overloaded Con	nstructors – Returning	obje	cts from method – The	e tos	String me	thod	– W	riting
an equals method	l – This reference varia	ıble -	<ul> <li>Enumerated types – 0</li> </ul>	Gar	bage colle	ectior	1.	
Unit: III Arı	rays						15	hrs
Introduction to a	rray – Processing array	у соі	ntents – Passing array	as a	argument	s to n	neth	ods –
Array algorithms	s and operations – Ret	urniı	ng array from method	s –	String ar	ray –	Arr	ay of
objects – Two-di	imensional array – Ari	ay v	with three or more dim	ens	ions. Str	ing E	land	lling:
String class – Sti	ring concatenation $-C$	omp	aring strings – Substri	ng -	- String c	lass n	neth	ods –
Other String clas	ss methods. Inheritan	ce:	Basics of inheritance -	– In	heriting a	and o	verr	iding
superclass metho	ods – Calling supercla	ss co	onstructor – Polymorp	hist	n - Class	ses th	at 11	nherit
from different cla	asses – Abstract classes	S - F	inal class.					
Unit: IV Into	erface and Package			<u> </u>			15	hrs
Basics of interfa	ce – Multiple interface	es -	Multiple inheritance u	ISIN	g interfac	e – N	Vlult	
interface – Packages. Exception Handling: Introduction – Try and catch block – Multiple								
catch blocks – N	Custom cry – Finally blo	CK -	- The throw statement	- t	exception	prop	agat	10n –
Throws clause – Custom exception – Built-in exceptions. Multithreading: Introduction –								
inreads in Java – Inread creation – Lifecycle of a thread – Joining a thread – Thread schedular								
scheduler – I nread priority – I nread synchronization.								
The file close	traama Tha huta at	0.000	Filtored byte stream	20	The rong	loma	13	nrs a filo
The file class – ;	Sueams – The byte str	eams	s – Filtered byte stream	15 -			cces	s me
Academic Coun	cil Meeting Held On	17.0	5.2022				Pa	ge 36

class – The character streams. Applets: Applet fundamentals – Applet class – Applet life							
cycle - Steps for developing an applet program - Passing values through parameters -							
Graphics in an applet – Event-handling.							
	Total Lecture Ho	ours	75				
Books	for Study:						
Java P	rogramming for core and advanced learners By Sagayaraj, Denis,	, Karthik	and				
Gajalak	shmi, Universities Press, 2018.						
	Unit I         Chapter1:1.1 to 1.8         Chapter2: 2.1 to 2.6, 2.9						
	Unit II Chapter3:3.1 to 3.14						
	Chapter4:4.1 to 4.15						
	UnitIII Chapter5: 5.1 to 5.9						
	Chapter6: 6.1 to 6.6						
	Chapter7: 7.1 to 7.7						
	UnitIV Chapter8:8.1 to 8.5						
	Chapter9:9.1 to 9.10						
	Chapter10: 10.1 to 10.8						
	UnitV Chapter 11: 11.1 to 11.6						
	Chapter12: 12.1 to 12.7						
Boo	oks for References:						
1.	1. Programming with Java A primer By E.Balagurusamy, Tata Mcgraw Hill Education						
	pvt Ltd New Delhi, 4 <sup>th</sup> Edition, 2010.						
2.	Java: The Complete Reference, by Herbert schildt, Tata McGraw hill Ec	lucation in	dia,				
_	Seventh Edition, 2006.	••••					
3.	Programming with java by C Muthu, Vijay Nicole india, Second Edition	n, 2008.					
Web R	esources:						
1. <u>http</u>	s://www.tutorialspoint.com/java/index.htm						
2. <u>http</u>	<u>s://www.javatpoint.com/java-tutorial</u>						
3. <u>http</u>	<u>s://www.w3schools.com/java/</u>						
Course	e Outcomes	K Lev	el				
At the	end of the course, the students will be able to						
CO1	Examine classes, Objects, Members of a class and relationships	V2					
COI	among them needed for a specific problem.	КЗ					
coa	Integrate Java programs using OOP principles and proper program	V2					
02	structure	K.S					
CO2	Determine the concepts of Polymorphism, inheritance, Packages and	IZ 2					
COS	Interface in java.	ĸs					
CO4	Explaining exception handling, multithreaded applications with	TZ A					
004	synchronization	<b>K</b> 4					
CO5.	Illustrate Java programs using AWT controls and applets for web	K A					
C05:	applications.	<b>N4</b>					

## CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	PO 6
CO 1	1	1	3	2	2	3
CO 2	1	2	1	2	3	3
CO 3	2	2	2	2	2	2
<b>CO 4</b>	2	2	2	2	2	2
CO 5	2	2	2	2	3	2

\*3 –Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

#### **LESSON PLAN**

UNIT	JAVA PROGRAMMING	Hrs	Pedagogy
Ι	<b>Foundations of Java:</b> Computer systems – Programming languages – Stage for Java – Origin of Java – Challenges of Java – Java features – Java program development – Object-oriented programming. <b>Java</b> <b>Essentials:</b> Elements of Java program – Java API – Variables and literals – Primitive data types – The string class – Operators – Constants.	15 Hrs	Chalk & Talk, ICT Kit
Π	<b>Control Statements:</b> The if statement – The if-else statement – Nested if statements – The if-else-if statement – Logical operators – Comparing string objects – The conditional operator – The switch statement – Increment and decrement operators – while loop – Do-while loop – For loop – nested loops – Break and continue statements. <b>Classes and</b> <b>Objects:</b> Classes and objects – Modifiers – Passing arguments – Constructors – Packages and import statements – Finding the classes and their responsibilities – Static class members – Overloaded methods – Overloaded Constructors – Returning objects from method – The toString method – Writing an equals method – This reference variable – Enumerated types – Garbage collection.	15 Hrs	Chalk & Talk, ICT Kit
III	<b>Arrays:</b> Introduction to array – Processing array contents – Passing array as arguments to methods – Array algorithms and operations – Returning array from methods – String array – Array of objects – Two-dimensional array – Array with three or more dimensions. <b>String Handling:</b> String class – String concatenation – Comparing strings – Substring – String class methods – Other String class methods. <b>Inheritance:</b> Basics of inheritance – Inheriting and overriding superclass methods – Calling superclass constructor – Polymorphism – Classes that inherit from different classes – Abstract classes – Final class.	15 Hrs	Chalk & Talk, ICT Kit
IV	<b>Interface and Package:</b> Basics of interface – Multiple interfaces – Multiple inheritance using interface – Multilevel interface – Packages. <b>Exception Handling:</b> Introduction – Try and catch block – Multiple catch blocks – Nested try – Finally block – The throw statement – Exception propagation – Throws clause – Custom exception – Built-in exceptions. <b>Multithreading:</b> Introduction – Threads in Java – Thread creation – Lifecycle of a thread – Joining a thread – Thread scheduler –	15 Hrs	Chalk & Talk, ICT Kit

	Thread priority – Thread synchronization.		
V	<b>File and I/O Streams:</b> The file class – Streams – The byte streams – Filtered byte streams – The random-access file class – The character streams. <b>Applets:</b> Applet fundamentals – Applet class – Applet life cycle – Steps for developing an applet program – Passing values through parameters – Graphics in an applet – Event-handling.	15 Hrs	Chalk & Talk, ICT Kit

**Course Designed by: Mrs. M. Muthulakshmi & Mr. M. Ramesh Kumar** Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
Internal	Cos	K L ovol	Section MCQ	n A )s	Section Short Ans	n B swers	Section C Fither	Section D		
Internat	COS	K Level	No. of. Questions	K - Level	No. of. Questions	K – Level	or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)		
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
	Que	No. of stions to be asked	4		3		4	2		
Question Pattern CIA I &	Que	No. of stions to be nswered	4		3		2	1		
II	Mar	ks for each uestion	1		2		5	10		
	Tota ead	l Marks for ch section	4		6		10	10		

**\*Note:** It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

	Distribution of Marks with K Level CIA I & CIA II								
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %	
	K1	2	2	-	-	4	8	20	
	K2	2	4	-	-	6	12	20	
	K3	-	-	20	20	40	80	80	
CIA I	K4	-	-	-	-	-	-	-	
	K5	-	-	-	-	-	-	-	
	Marks	4	6	20	20	50		100	
	K1	2	2	-	-	4	8	20	
	K2	2	4	-		6	12	20	
CIA II	K3	-	-	10	10	20	40	40	
	K4	_	_	10	10	20	40	40	
	K5	-	-	-	-	-	-	-	
	Marks	4	6	20	20	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.

Summa	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)								
S. No	COs	K - Level	MCQ No. of Questions	)s K – Level	Short A No. of Questio	nswers K – Level	Section C (Either / or Choice)	Section D (Open Choice)	
1	CO1	К3	2	K1.K2	1	K2	2(K3.K3)	1(K3)	
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)	
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)	
No. o	of Questic Asked	ons to be	10		5		5	5	
No.c	of Questio answere	ons to be ed	10		5		5	3	
Marks for each question		1		2		5	10		
Total Marks for each section		10		10		25	30		
(	(Figures i	in parenthe	sis denotes, q	uestions s	hould be as	sked with	the given K	level)	

	Distribution of Marks with K Level									
K	Section A	Section B	Section C	Section D	Total	% of	Consolidated			
Level	(Multiple	(Short	(Either/ or	( Open	Marks	(Marks	%			
	Choice	Answer	Choice)	Choice)		without				
	<b>Questions</b> )	Questions)				choice)				
K1	5		-	-	5	4	16			
K2	5	10	-	-	15	12				
K3	-	-	30	30	60	50	50			
K4	-	-	20	20	40	34	34			
Marks	10	10	50	50	120	100	100			
NB: Hig	NB: Higher level of performance of the students is to be assessed by attempting higher level									
of K lev	els.				-		-			

Section	A (Mu	Itiple Cho	ice Questions)
Answei	r All Qu	uestions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (Sho	ort Answer	rs)
Answei	r All Qu	uestions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r All Qu	uestions	(5  x  5 = 25  marks)
Q. No	CO	K Level	Questions
16) a	COl	K3,K3	
16) b	COl	K3,K3	
17) a	CO2	K3,K3	
17) b	CO2	K3,K3	
18) a	CO3	K3,K3	
18) b	CO3	K3,K3	
19) a	<u>CO4</u>	K4,K4	
19) b	CO4	K4,K4	
20) a	CO5	K4,K4	
20) b	005		
NB: Hi	gher le	vel of perfo	ormance of the students is to be assessed by attempting higher
level of	K leve	$\frac{15}{1}$	
Section		en Choice)	(2x10-30  morts)
Allswei O No		K L ovol	Ouestions (5X10=50 marks)
$\frac{\mathbf{Q}}{21}$	CO1	K Level	Questions
$\frac{21}{22}$	CO1	K2	
22	$CO_2$	K2	
23	$CO_4$	KA	
24	C04	K4 K/	
23	CUS	<b>K</b> 4	

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Cour	se Name	JAVA Programming Lab			
Cour	se Code	21UCACP3	L	Р	С
Cate	gory	Core Lab	-	4	4
Natu	re of cour	se: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPI	RENI	EUR	SHIP
Cour	se Objecti	ives:			
•	Build pr Impleme Impleme Design a Generate	ogramming skills using java for real world requests. ent constructors, interfaces and overloading concepts ent standard problems using java programming. and develop the concept of inheritance and its types. e java programs using applets.			
1 2 3	Simple Pr Program Construct	rograms without classes and objects, methods based on the concepts of classes and objects for and Parameterized constructor		12	2 Hrs
4 5 6	Method o Construct Single lev	overloading for overloading vel & Multi level inheritance		12	2 Hrs
7 8 9	Abstract Arrays Exceptior	Classes, Interface n Handling		12	2 Hrs
10 11	Package Multithre	ading		12	Hrs
12 13	Applet I/O Hand	ling and File Handling		12	Hrs
	D	Total Lecture He	ours		60
Web 1. <u>htt</u> 2. <u>htt</u> 3. htt	Resources ps://www. tps://javat tps://www.	s <u>javatpoint.com/java-programs</u> <u>utoring.com/java-programs/</u> .programiz.com/java-programming/examples			
Cour	se Outcon	nes		K	Level
At th	e end of t	he course the students will be able to			
C01	Relate s	software development skills using java programming for real world tions.			K2
CO2	: Implem	ent Packages, interfaces and inheritance concepts			K3
CO3	: Determ	ine classical problems using java programming.			K3
<b>CO4</b>	: Analyse	e, Design and develop the concept of Multithreading			K4
CO5	: Examin	e java programs using AWT controls			K4

#### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	2	2	3	2	2	2
CO 2	2	2	2	3	2	2
CO 3	2	3	2	3	2	2
<b>CO 4</b>	2	2	2	2	2	2
CO 5	2	1	2	3	2	3

\*3 –Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

## **LESSON PLAN**

	List of Programs	Hrs	Pedagogy
1 2 3	Simple Programs without classes and objects, methods Program based on the concepts of classes and objects Constructor and Parameterized constructor		
4 5 6	Method overloading Constructor overloading Single level & Multi level inheritance		Black Board,
7 8 9	Abstract Classes, Interface Arrays Exception Handling	60	Demonstration and LCD Projector.
10 11	Package Multithreading		
12 13	Applet I/O Handling and File Handling		

Course Designed by: Mrs. M. Muthulakshmi & Mr. M. Ramesh Kumar Assistant Professor



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) **DEPARTMENT OF COMPUTER APPLICATIONS** (For those who joined in 2021-2022 and after)

Course Name	PRINCIPLES OF ACCO	OUN	ITING				
Course Code	21UCOA32				L	Р	С
Category	ALLIED				5	-	4
Nature of cours	e: EMPLOYABILITY	$\checkmark$	SKILL ORIENTED	ENTREP	RENEU	JRSH	IP
Course Objecti	ves:	•					
1. To understand	I the basic concepts and co	nver	ntion of accounting, account	nting syster	n.		
2. To know how	2. To know how the accounting entries are posted in books.						
3.10 familiarize	the learner to prepare the account	inan	of trading and non-trading	aoncorna			
4. To train the le	ledge on the depreciation r	ints ( noth	of trading and non- trading	g concerns			
J. TO gain know		netn	ous		1	5 Hoj	irc
Meaning and de	finition of Book keeping	and	accounting - Functions of	f accountin	$\frac{1}{\alpha - \Omega h}$	<u>jectiv</u>	ns es of
accounting = A	dvantages & limitation of	f ac	counting - Double entry	system of	$\frac{1}{2}$ book	keeni	$n\sigma =$
Advantages of	double entry system – D	oiffer	ence between single entry	v system	and do	uble e	entrv
system.			enee setween single end	j sjstem	und do	4010	Jiiler y
UNIT: II JO	JURNAL				1	5 Hoi	ırs
Meaning - Defi	nition - Advantages of Joy	urna	l- Golden rules of Accou	unting- Ty	pes of a	accour	nts –
Passing of Journ	al Entries				L		
UNIT: III LI	EDGER				1	5 Hou	ırs
Meaning – Adva	antages – Difference betwe	en Jo	ournal and ledger – Baland	cing of acco	ounts in	the le	edger
- Practical exerc	ises for the preparation of	ledg	er.	-			_
UNIT: IV TI	RIAL BALANCE				1	5 Ноі	ırs
Meaning – Obje	ectives – Distinction betwe	een 7	Frial balance and Balance	sheet - Pr	eparatio	on of	Trial
Balance							
UNIT: V FI	NAL ACCOUNTS				1	5 Hoi	ırs
Meaning of Fin	al accounts – Objectives -	— F	ormat of trading, profit a	nd loss acc	count a	nd bal	ance
sheet. Simple a	ljustments in final accounts	s (ot	itstanding, prepaid, deprec	iation) – Pi	actical	proble	ems
			Total I	Lecture Ho	ours 7	5 Hou	ırs
(80% of marks	must be allotted to proble	em s	olving questions. 20% of	marks mu	st be a	llotted	l to
Theory question	s).	0.0/	on Theory				
Question must b	e asked 80% off Problem 2	0 %					
Books for Stud	y:						
1. T.S.Grewal, '	Double Entry Book-Keepi	ing",	Sultan Chand & Sons, Ne	w Delhi, re	eprint20	002.	
<b>Books for Refe</b>	rences:						
<ol> <li>T.S.Reddy and A.Murthy, "Financial Accounting", Margham Publications, 6<sup>th</sup> Edition, Reprint 2014.</li> </ol>							
Web Resources	•						
1. <u>https://onlin</u>	<u>1ecourses.nptel.ac.in/noc1</u>	19 n	ng37/preview				
Academic (	Council Meeting Held On	17.(	)5.2022		P	age 45	5

2. <u>htt</u> 3. htt	<ol> <li><u>https://www.youtube.com/watch?v=P9JIBbZas3w</u></li> <li><u>https://onlinecourses.swayam2.ac.in/cec20_mg23/preview</u></li> </ol>						
Course	e Outcomes	K Level					
<b>CO1:</b>	To understand the basic Accounting concepts.	Up to K2					
<b>CO2:</b>	To apply the kinds of cash book.	Up to K2					
CO3:	To apply the practice of final accounts.	Up to K2					
<b>CO4:</b>	To solve the various methods of Depreciation.	Up to K2					
CO5:	To identify the features of Non Trading Organization.	Up to K2					

#### CO & PO Mappings:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	3	2	3	2
CO2	3	2	3	3	3	2
CO3	3	2	3	2	2	2
<b>CO4</b>	3	1	2	2	2	3
CO5	3	2	3	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

# **LESSON PLAN**

UNIT	Basics of Accounting	Hrs	Pedagogy
Ι	Book Keeping	5	Chalk and Talk
II	Subsidiary books	5	Chalk and Talk
III	Final Accounts	7	Chalk and Talk
IV	Depreciation	6	Chalk and Talk
V	Non trading Organization	7	Chalk and Talk

**Course Designed by:** 

Dr. N. Saraswathi Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print											
Articulation Mapping – K Levels with Course Outcomes (COs)												
				Section	n A	Section	B B	Section C	Section D			
Inte	Co	S	K Level	MCC	)s	Short Ans	swers	Section C Either or	Open			
rnal		~		No. of.	<b>K</b> -	No. of.	<b>K</b> -	Choice	Choice			
				Questions	Level	Questions	Level					
CI	CO	)1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO	02	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO	)3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO	)4	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)			
		No. of Questions		4		3		4	2			
Oues	tia		to be asked	•				•	-			
Ques n	10	ľ	No. of Questions	4		3		2	1			
Patte	rn		to be answered	-		-		_	-			
CIA	I		Marks for each	1		2		5	10			
& I	Ι		question					-	-			
		,	Total Marks for	4		6		10	10			
		each section	-		-							

**\*Note:** It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

		D	Distribution of	f Marks with	K Level CI	AI&CI	AII	
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	2	-		4	8	20
	K2	2	4	-	-	6	12	
СТА	K3	-	-	20	20	40	80	80
	K4	-	-	-	-	-	-	-
-	Marks	4	6	20	10	50	100	100
	K1	2	2	-		4	8	20
	K2	2	4	-	-	6	12	
CIA	K3	-	-	10	10	20	40	40
II	K4	-	-	10	10	20	40	40
	Marks	4	6	20	20	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.

Summa	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes											
	(COs)											
			MCC	)s	Short An	swers	Section C	Section D				
S. No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	(Open Choice)				
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
No.	of Questi Aske	ions to be d	10		5		10	5				
No.of Questions to be answered			10		5		5	3				
Marks for each question			1		2		5	10				
Total Marks for each section			10		10		25	30				
(	Figures	in parenthesi	s denotes, qu	estions s	hould be ask	ked with	the given K	level)				

		D	istribution of	Marks with	K Level		
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5		-	-	5	4	16
K2	5	10	-	-	15	12	10
K3	-	-	30	30	60	50	50
K4	-	-	20	20	40	34	34
Marks	10	10	50	50	120	100	100
ND II'	1 1 1 0	C	641 4 1 4	• • • •	11		1.1.1

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

Section	A (Mu	iltiple Cho	ice Questions)
Answei	r All Q	uestions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answei	rs)
Answei	r All Q	uestions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r All Q	uestions	(5  x  5 = 25  marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3,K3	
16) b	COl	K3,K3	
17) a	CO2	K3,K3	
17) b	CO2	K3,K3	
18) a	CO3	K3,K3	
18) b	CO3	K3,K3	
19) a	CO4	K4,K4	
19) b	CO4	K4,K4	
20) a	CO5	K4,K4	
20) b	<u>CO5</u>	K4,K4	
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting
higher	level of	f K levels	×
Section	D (Op	en Choice	
Answei	$\frac{r \text{ Any '}}{CO}$	Three ques	tuons (3x10=30 marks)
Q. No	<u>CO</u>	K Level	Questions
21		K3	
22	<u>CO2</u>	K3	
23	<u>CO3</u>	K4	
24	<u>CO4</u>	K4	
25	CO5	K4	

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Cours	e Name	PYT	HOI	N LAB													
Cours	e Code	21UC	CAS	P3											L	Р	С
Categ	ory	Skill													-	2	2
Natur	e of Cour	rse:	EN	IPLOY	ABIL	ITY	$\checkmark$	SI	KILI	ORI	ENT	ED	$\checkmark$	ENTREP	RENE	URSE	IIP
COUF	RSE OBJ	ECTI	VES	:													
•	To learn	and u	nder	stand P	ython p	rogra	mmi	ing	basi	cs and	d par	adign	1.				
•	To learn	and u	nder	stand p	ython lo	ooping	g, co	ontr	ol st	ateme	ents a	ind m	anip	ulations.			
•	• Demonstrate the concepts of GUI controls and designing GUI applications.																
•	To learn applicati	and ki	now	the cor	ncepts o	f pyth	non p	oro	gram	ming	; func	ctions	and	implement	real-	time	
1	Create a simple calculator to perform the arithmetic operations																
2	Using control structures 6 Hrs																
3	F	Functio	ns														
4	F	Recursi	on													6 Hrs	
5	S	String Handling Functions															
6	U	Using classes and Objects															
7	ι	Jsing A	Array	/S												6 Hrs	
8	L	List															
9	Т	Tuple															
10	S	Sequen	ce													6 Hrs	
11	Γ	Diction	aries														
12	E	Excepti	on F	Iandlin	g												
13	F	Files an	d D	rectori	es											6 Hrs	
											T	'otal ]	Lect	ure Hours		30	
Web	Resource	es															
1. <u>htt</u>	os://wwv	v.prog	ran	niz.com	n/pyth	on-p	rogi	rar	nmi	ng/ex	<u>kam</u>	<u>ples</u>					
2. <u>htt</u>	os://wwv	v.geek	sfo	geeks	.org/py	<mark>thon</mark>	l-pr	ogi	ram	ming	<mark>-exa</mark>	mpl	es/				
3. <u>htt</u>	https://www.sanfoundry.com/python-problems-solutions/																
Cours	Irse Outcomes K Level																
CO1:	Define a	and der	mon	strate t	he use $\frac{1}{1}$	of buil	t-in	dat	$\frac{1}{1}$	uctur	es an	d fun	ctior	18		K3	
$\frac{\text{CO2:}}{\text{CO2}}$	Interpre	t the lo	ogic	into co	ae using	g tunc	tion	s ai	nd m	odule	es true 1	tat -				K2	
CO3	Execute	e the pr	ogra	INS USI	ng oran	cning	, 100	pin	ig an	$\frac{1}{to c^1}$	urol s	staten	ients	8		K3 K2	
CO5:	Exemine	Implement static and dynamic web pages using Python tool K3															
005:	:   Examine a Python program to solve a specific or real-world problems. K4																
											<b>I</b>	งเลเ	Lect	ure nours	30		

#### CO & PO Mapping:

COS	PO 1	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	2	2	2	1	2	3
CO 2	2	2	2	2	1	3
CO 3	2	2	1	2	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	1	2	2	3	3	1

\*3 –Advanced Application; 2 – Intermediate Development; 1 – Introductory Level

#### LESSON PLAN

SUBJECT NAME	Hrs	Mode
1. Create a simple calculator to perform the arithmetic		
operations		
2. Using control structures		
3. Functions		
4. Recursion		
5. String Handling Functions		
6. Using classes and Objects		
7. Using Arrays	30	PPT
8. List		
9. Tuple		
10. Sequence		
11. Dictionaries		
12. Exception Handling		
13. Files and Directories		

Course designed by: Mrs. M. Muthulakshmi & Mr. M. Rameshkumar



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course N	Name	HTML Programming	g						
Course (	Code	21UCAN31				L	Р	С	
Category	y	Non-Major Elective				-	2	2	
Nature of Course:	f	EMPLOYABILITY	✓	SKILLORIENTED	ENTREPRENE	URSI	HIP	~	
COURS	E OBJ	ECTIVES:							
C     D     D     T     Unit: I     D	Create H Develop Basic Ur Understa Co study Intr Designir	TML Documents with the a static website using Headerstanding of creating and the fundamentals of the and apply the Hypertex <b>roduction to HTML</b> and a Home Page – I	form lyper graf HTM at Ma Histo	atting, images, tables, r Text Mark-up Langu phics for the web ML elements and attrib arkup Language (HTM pry of HTML – HT	frames age outes IL).	<u>6 hr:</u> s –	5 HTI	ML	
Documer	nts – A	nchor Tag – Hyper Li	nks ·	-Designing the Body	Section: Headin	g Pri	inting	g –	
Embeddi	Aligning the Headings – Horizontal Rule – Paragraph – Tab Strings – Image and Pictures – Embedding PNG Format Image.								
Unit: II	Unit: II     Ordered and Unordered Lists     6 hrs								
O Lists – N	Ordered and Unordered Lists: lists – Unordered Lists – Headings in a list – ordered Lists – Nested Lists.								
Unit: II	I Tab	le Handling:				6 hrs	5		
T Cells Spa	able Ha	andling: Tables – Table Multiple Rows /Column	e Cre 1s –C	eation in HTML – Wi Coloring Cells – Colun	idth of the Table on Specification.	and	Cell	s –	
Unit: IV	/ Fra	mes:				6 hrs	5		
F	ramese	t Definition – Frame De	finit	ion – Nested Frameset	ts				
Unit: V	For	ms:				6 hrs	5		
A Forms.	Action A	Attribute – Method Att	ribu	te – Enctype Attribut	te –Drop Down	List-	Sam	ple	
1. <u>http://</u>	www.v	v3schools.com / html /	htm	l_exercises					
2. <u>http://</u>	2. http://www.landofcode.com/html-exercises/								
5. <u>https://spoken-tutoriai.org/tutoriai-searcn//searcn_loss=H1ML&amp;searcn_language</u> Course Outcomes: K Level									
CO1:	Course Outcomes.       K Level         CO1:       Identifying the important HTML tags for designing static pages and separate design from content using Cascading Style sheet       K3								
CO2:	Experi compo enviro	menting screen-based up onents, and navigation synthesis in standard states in states	ser i yster tic w	nterfaces, with graphic ns to achieve a unified veb pages.	cs, textual l, functional	ŀ	ζ3		

CO3:	Differentiate between linked, embedded and inline style specifications	K4
CO4:	Correlate a web page and identify its elements and attributes	K4
CO5:	Categorize the rules and techniques to create and design the web pages	K4

#### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	3	2	3	3
CO 2	2	2	3	2	2	3
CO 3	3	2	3	3	2	2
<b>CO 4</b>	2	3	2	3	2	3
CO 5	2	3	3	3	3	3

\*3 –Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

UNIT	HTML Programming	Hrs	Pedagogy
I	<b>Introduction to HTML</b> : Designing a Home Page – History of HTML – HTML Generations – HTML Documents – Anchor Tag – Hyper Links –Designing the Body Section: Heading Printing – Aligning the Headings – Horizontal Rule – Paragraph – Tab Strings – Image and Pictures –Embedding PNG Format Image.	6	Chalk & Talk, ICT Kit
II	<b>Ordered and Unordered Lists</b> : Ordered and Unordered Lists: lists – Unordered Lists – Headings in a list – ordered Lists – Nested Lists.	6	Chalk & Talk, ICT Kit
III	<b>Table Handling:</b> Table Handling: Tables – Table Creation in HTML – Width of the Table and Cells – Cells Spanning Multiple Rows /Columns –Coloring Cells – Column Specification.	6	Chalk & Talk, ICT Kit
IV	<b>Frames:</b> Frameset Definition – Frame Definition – Nested Framesets	6	Chalk & Talk, ICT Kit
V	<b>Forms:</b> Action Attribute – Method Attribute – Enctype Attribute – Drop Down List-Sample Forms.	6	Chalk & Talk, ICT Kit

Course designed by: Dr. R. Bagavathi Lakshmi & M. Muthulakshmi





## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	DATABASE MANAGE	MEN	NT SYSTEM				
Course Code	21UCAC41				L	Р	С
Category	Core				5	-	4
Nature of cours	se: EMPLOYABILITY	<ul> <li>✓</li> </ul>	SKILL ORIENTED 🗸	ENTREPI	RENE	URS	HIP
Course Object	ives:						
• To unde	rstand the basic concepts of	f data	abase systems and familiar	with databa	ise sto	orage	
structure	×S.	. 1	· · · · · · · ·	. 1		, <b>.</b> ,	
<ul> <li>Develop</li> <li>relations</li> </ul>	the logical design of the da	itaba	se using data modeling con	cepts such	as en	tity-	
<ul> <li>To emplications</li> </ul>	asize the importance of no	rmali	ization in databases.				
To Mast	er the basics of SOL and co	onstri	act queries using SOL.				
• To under	stand the concepts of PL/S	OL c	ursors and triggers				
Unit: I Data	A. Information and Inform	<u>x= -</u> natio	n Processing			15 H	[rs
Introduction –	Definition of information.	Oual	ity of information. Files. F	ile organi	zatio	n an	d file
structures: Int	roduction – Operations of	on fi	les – File storage organi	zation –	Stora	ge n	nedia.
Introduction t	o Database Managemen	t Sy	stem (DBMS): Introducti	on – Why	, a d	lataba	ase –
Characteristics	of data in a Database – Wh	y DB	MS - Types of Data Base I	Manageme	nt Sys	stem.	
Unit: II Intro	oduction to Relational Da	taba	se Management System:	U		15 H	[rs
Introduction – F	RDBMS terminology – The	Rela	ational data structure – Rela	tional data	mani	pulat	ion –
Codd's rules. E	ntity - Relationship (E-R)	Мо	deling: E-R model – Comp	onents of a	an E-l	R mo	del –
E-R modeling s	symbols. Data Normalizat	ion:	Introduction - First Norma	al Form –	Secor	nd No	ormal
Form – Third N	Normal Form – Boyce–Co	dd N	ormal Form – Fourth Nor	mal Form	– Fif	th No	ormal
Form							
Unit: III Rela	tional algebra and Relation	onal	calculus:			15 H	[rs
Relational alge	ebra - Relational calcul	us.	Introduction to Structu	ired Que	ry I	ang	uage:
Introduction – C	Characteristics of SQL - A	dvan	tages of SQL – SQL data t	ypes and I	Literal	s - 7	Гypes
of SQL comma	nds – SQL operators – Ar	ithm	etic, Comparison operators	- Logical	opera	ators	- Set
operators – Ope	rator precedence.						
Unit: IV Tal	oles, Views and Indexes:					15 H	lrs
Tables-Views.	Queries and Sub queries:	Que	ries – Sub queries. Aggrega	ate functio	ns –	Join	s and
Unions: Joins.							
Unit: V Intro	oduction to PL/SQL:					15 H	lrs
PL/SQL Blocks	s – PL/SQL Architecture-	PL/	SQL variables – PL/SQL	data type	s –		
Control Structures – Cursors – PL/SQL Exceptions – PL/SQL Triggers – Types of							
Triggers							
			Total L	ecture Ho	urs	75 H	lrs
Books for Study	f • •						
Alexis Leon and	Mathews Leon, Database M	Mana	gement Systems, Leon Vik	as Publishi	ng, N	lew I	Delhi,
1999.							
Unit I : Chapte	r 1,3 and 5						
Unit II : Chapter	7,9 and 11						

Unit II	I: Chapter 12 and 14	
Unit IV	/ : Chapter 15,17,18 and 21	
Unit V	: Chapter 46-D	
Book f	for References:	
1. At	oraham Silberschtz, Henry F. Korth, S.Sudershan, Data Base System Concepts, 4	th Edition,
Mo	cGraw Hill International Editions, New Delhi, 2002.	
2. D	ate C.J., An Introduction to Database Systems Vol.1, Narosha Publishing House, N	New Delhi,
19	95.	
3. Ro	bb, Coronel, "Database Systems", Seventh Edition, Cengage Learning.	
Web	Resources:	
1.	https://onlinecourses.nptel.ac.in/noc18 cs15/preview	
2.	http://nptel.ac.in/courses/106106095/	
3.	https://www.javatpoint.com/dbms-tutorial	
Cours	e Outcomes:	K Level
At the	end of the course the students will be able to	
CO1	Enumerate the underlying concepts of the management of database systems.	K2
<b>CO2</b>	Describe the structure and model of the relational database System	K2
CO3	Analyze a database based on a data model considering the normalization to a specified level	K4
CO4	Solve simple and moderately advanced database queries using Structured Query Language (SQL)	K3
CO5	Explaining multiple tables using group functions, sub queries and Implement cursor and trigger concept for a given scenario	K4

## CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	1	2	2	2	2	2
CO 2	2	3	2	2	1	3
CO 3	3	1	2	2	2	2
CO 4	2	2	2	3	2	2
CO 5	2	2	2	3	2	2

\*3-Advanced Application;2-Intermediate Development; 1-Introductory Level

#### LESSON PLAN

UNIT	DATABASE MANAGEMENT SYSTEM	Hrs	Pedagogy
I	<b>Data, Information and Information Processing:</b> Introduction – Definition of information, Quality of information. <b>Files, File</b> <b>organization and file structures:</b> Introduction – Operations on files – File storage organization – Storage media. <b>Introduction to Database</b> <b>Management System (DBMS):</b> Introduction – Why a database – Characteristics of data in a Database – Why DBMS – Types of Data Base Management System.	15	Chalk & Talk, ICT Kit
П	<ul> <li>Introduction to Relational Database Management System: Introduction – RDBMS terminology – The Relational data structure – Relational data manipulation – Codd's rules. Entity - Relationship (E- R) Modelling: E-R model – Components of an E-R model – E-R modelling symbols. Data Normalization: Introduction – First Normal Form – Second Normal Form – Third Normal Form – Boyce – Codd Normal Form – Fourth Normal Form – Fifth Normal Form – Denormalization.</li> </ul>	15	Chalk & Talk, ICT Kit
III	<b>Relational algebra and Relational calculus:</b> Relational algebra - Relational calculus. <b>Introduction to Structured Query Language:</b> Introduction – Characteristics of SQL - Advantages of SQL – SQL data types and Literals – Types of SQL commands – SQL operators – Arithmetic, Comparison operators - Logical operators - Set operators – Operator precedence.	15	Chalk & Talk, ICT Kit
IV	<b>Tables, Views and Indexes:</b> Tables-Views. <b>Queries and Sub queries</b> : Queries – Sub queries. <b>Aggregate functions – Joins and Unions:</b> Joins.	15	Chalk & Talk, ICT Kit
V	Introduction to PL/SQL: PL/SQL Blocks – PL/SQL Architecture- PL/SQL variables – PL/SQL data types – Control Structures – Cursors – PL/SQL Exceptions – PL/SQL Triggers – Types of Triggers	15	Chalk & Talk, ICT Kit

Course Designed by: Mrs. R.Vasuki & Dr. R. Bagavathi Lakshmi

Learning Outcome Based Education & Assessment (LOBE)										
Formative Examination - Blue Print										
	Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section A		Section B		Section	Section		
Internal	Cos	K Level	MCQs		Short Answers		Either	D		
	COS	K Level	No. of. Questions	K - Level	No. of. Questions	K – Level	or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)		
AI	<b>CO2</b>	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
	Que	No. of stions to be asked	4		3		4	2		
Question Pattern CIA I &	Que	No. of stions to be nswered	4		3		2	1		
II	Mar	ks for each uestion	1		2		5	10		
Tota		l Marks for ch section	4		6		10	10		

**\*Note:** It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

Distribution of Marks with K Level CIA I & CIA II								
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	2	-	-	4	8	20
CIA I	K2	2	4	-	-	6	12	20
	K3	-	-	20	20	40	80	80
	K4	-	-	-	-	-	-	-
	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	50		100
	K1	2	2	-	-	4	8	20
CIA II	K2	2	4	-		6	12	20
	K3	-	-	10	10	20	40	40
	K4	-	-	10	10	20	40	40
	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	50		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)												
			MCC	)s	Short Answers		Section C	Section D				
S. No	COs	K - Level	No. of Questions	K – Level	No. of Questio ns	K – Level	(Either / or Choice)	(Open Choice)				
1	CO1	K2	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
2	CO2	K2	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
3	CO3	K4	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
4	CO4	K3	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
No. o	of Questic Askec	ons to be l	10		5		10	5				
No.of Questions to be answered			10		5		5	3				
Marks for each question		1		2		5	10					
Total Marks for each section		10		10		25	30					
	<b>Figures</b>	in parenthe	sis denotes, a	uestions s	hould be as	sked with	the given K	level)				

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

	Distribution of Marks with K Level											
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %					
K1	5		-	-	5	4	16					
K2	5	10	-	-	15	12	10					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	34	34					
Marks	Marks 10 10 50 50 120 100 100											
NB: Hig	NB: Higher level of performance of the students is to be assessed by attempting higher level											
of K lev	els.				-		_					

Section A	A (Mul	tiple Choic	re Questions)
Answer	· All Qu	iestions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section 1	B (Shor	t Answers	
Answer	· All Qu	iestions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eith	er/Or Type	
Answer	· All Qu	iestions	(5 x 5 = 25 marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3,K3	
16) b	CO1	K3,K3	
17) a	CO2	K3,K3	
17) b	CO2	K3,K3	
18) a	CO3	K3,K3	
18) b	CO3	K3,K3	
19) a	CO4	K4,K4	
19) b	CO4	K4,K4	
20) a	CO5	K4,K4	
20) b	CO5	K4,K4	
NB: Hig	her lev	el of perfoi	rmance of the students is to be assessed by attempting higher
level of I	<b>X</b> levels	~	
Section 1	D (Ope	n Choice)	
Answer	Any T	hree quest	ions (3x10=30 marks)
<b>Q. No</b>		K Level	Questions
21	COI	K3	
22	<u>CO2</u>	K3	
23	<u>CO3</u>	K4	
24	CO4	K4	
25	005	К4	

# **Summative Examinations - Question Paper – Format**



MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name DATABASE MANAGEMENT SYSTEM – LAB								
Course Code 21UCACP4	L	Р	С					
Category Core Lab	-	4	4					
Nature of course:EMPLOYABILITYImage: Mail Content of Course of	RENE	URS	HIP					
COURSE OBJECTIVES:								
• To provide a sound introduction to the creation of problem statements from real	life s	ituati	ons.					
<ul> <li>To give a good formal foundation on the relational model of data.</li> <li>To introduce the concerns of basic SOL as a universal Database language.</li> </ul>								
<ul> <li>To introduce the concepts of basic SQL as a universal Database language.</li> <li>To apple the design of an officient detabase using normalization concepts</li> </ul>								
<ul> <li>To enable the design of an enficient database using normalization concepts.</li> <li>To have an introductory knowledge about the PL/SOL concept.</li> </ul>								
SOL COMMAND		15						
1 DDL: Experiments using database DDL SOL statements		15						
2 DML: Experiment using database DML SQL statements								
3. DCL: Experiment using database DCL SQL statements								
SOL OUERIES		15						
4. SOL Oueries: Aggregate functions								
5. SOL Oueries: Joins								
6. SQL Queries: String functions and Numeric functions								
7. SQL Queries: Pattern matching ,Logical and Relational operators								
Views								
PL/SQL		30						
1. Simple programs in PL/SQL								
2. Exception Handling: PL/SQL Procedure for application using exception handling								
3. Functions: PL/SQL Procedure for application using functions								
4. Cursor: PL/SQL Procedure for application using cursors								
5. Trigger: PL/SQL Procedure for application using triggers								
Total Lecture He	ours	60						
Web Resources:								
1. <u>https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm</u>								
2. https://www.w3schools.com/sql/								
5. https://www.javatpoint.com/dbms-sqi-introduction	T	ΖΤ	1					
Course Outcomes     K Level								
At the end of the course the students will be able to Summarize data manipulation language to quark undate and manage a	the end of the course the students will be able to							
CO1: Summarize data manipulation language to query, update and manage a database		K2						
CO2: Demonstrate the fundamental elements of relational database management		K3						
systems		кJ						
CO3: Analyze the database using queries to retrieve records		K4						
CO4: Illustrate views to satisfy the user's changing requirements		K4						
<b>CO5:</b> Examine PL/SQL for processing data base.		K4						

### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	2	2	3	2	2	2
CO 2	2	2	2	3	2	2
CO 3	3	2	2	1	2	3
<b>CO 4</b>	2	2	2	2	2	3
CO 5	1	2	3	3	2	2

3. Advanced Applications 2. Intermediate Development 1.Introductory Level

### **LESSON PLAN**

DATABASE MANAGEMENT SYSTE	M - LAB Hrs	Pedagogy
SQL COMMAND1.DDL: Experiments using database DDL SQL sta2.DML: Experiment using database DML SQL sta3.DCL: Experiment using database DCL SQL state	tements 15 ements	DEMO&PPT
SQL QUERIES4.SQL Queries: Aggregate functions5.SQL Queries: Joins6.SQL Queries: String functions and Numeric func7.SQL Queries: Pattern matching ,Logical and Rela8.Views	tions 15 ational operators	DEMO&PPT
PL/SQL         1.Simple programs in PL/SQL         2.Exception Handling: PL/SQL Procedure for applexception handling         3.Functions: PL/SQL Procedure for application using         4.Cursor: PL/SQL Procedure for application using         5.Trigger: PL/SQL Procedure for application using	ication using ing functions cursors g triggers	DEMO&PPT

Course Designed by Mrs. R.Vasuki & Dr. R.Bagavathi Lakshmi



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	BASICS OF COST ACC	OUNTING					
Course Code	21UCOA42			L	Р	С	
Category	Allied			5	-	4	
Nature of cours	e: EMPLOYABILITY 🗸	SKILL ORIENTED	✓ ENTREPRENEU	RSH	IP	✓	
Course Objecti	ves:						
To enable	e the students to be aware	of Meaning, Element	ts of Cost, Material C	Cost,	Lab	our	
and over	heads cost as an element of	total cost.					
• To train	he students in finding the c	ost of products using o	lifferent methods of c	ostin	g.		
• To enab	e the students to be awar	re of process costing	as amethods of cos	ting	and	its	
applicati	on and accuracy of cost she	et.					
Use acco	unting methods of cost calc	culation.					
Unit: I Intro	oduction			15 l	houi	rs	
Introduction: De	finition of Costing – Object	ts & advantages of cos	sting – Difference bet	ween		st	
accounting & Fi	nancial accounting – Install	ation of costing syster	n – Classification and	anal	ysis	of	
costs – Specime	n of Cost Sheet - Preparatio	on of cost sheet (simple	e problems only)				
Unit: II Mat	erials			15 I	houi	rs	
Materials: Main	enance of stores & records	-E.O.Q — Different	Level of Stock-Reord	er le	vel-		
Maximum Leve	- Minimum Level- Average	e level and Danger Lev	vel – Pricing of mater	ial is	sues		
(FIFO, LIFO)							
Unit: III   Lab	our			15	houi	rs	
Labour Turn ove	er – Methods of Remunerati	ing Labour – Incentive	e Schemes- Halsey – H	Rowa	ın &		
Unit: IV Ove	htai pièce rate system (Sim beads	ipie problems Only).		15]	hom	<b>*</b> 6	
Overheads: Mea	ning – Classification – Spec	cific System - Allocati	on Apportionment &	Ahs	ornt	ion	
of overheads - P	rimary and Secondary Distr	ribution of Overhead	on, Apportionnent &	105	orpt	1011	
Unit: V Bude	et and Budgetary Control			151	hom	rs	
Meaning – Obi	ectives – Advantages – Liu	mitations – Classifica	tion of Budgets - Pr	enar	ation		
Functional budg	ets – Material purchase bud	lget, sales budget and (	Cash budget.	cpur	ation	1 01	
			Total Lecture Hour	<b>·s</b> 7	5 H	rs	
Books for Stud	/:						
S.N. Maheswari	Cost Accounting, Sultan	Chand & Sons (P) Ltd	., New Delhi, Reprint	ed 20	)11.		
Unit I	- Chapters 1(Full), 2(Full)						
Unit II – Chapters 3(Full), 4(Full)							
Unit III – Chapters 6(Full), 7(Full)							
Unit IV– Chapters 9(Full), 10(Full)							
Unit V - Section C (C.1-C.52)							
<b>Books for Refe</b>	ences:						
1. S.P. Jain and	K.L.Narang, Cost Account	ing, Kalyani Publisher	s, New Delhi, Reprin	ted 2	011.		
2. R.S.N. Pillaia	nd S. Bhagavathy, Cost A	ccounting, S.Chand C	Company Ltd, New D	elhi,	Rep	rint	
with corrections	2011.						
with corrections	2011.	8,	<b>I U J U U</b>	- 1	-1	-	

3. Jain, S/ Narang, K. 8th rev edKalyani, Advanced Cost & Management Accounting, 4th editionNote:

The Questions should be asked in the ratio of 60% as problems and 40% as theory.

Web R	Lesources:	
https:/	/corporatefinanceinstitute.com	
www.li	iedunote.com	
Course	e Outcomes	K Level
CO1:	Through knowledge about meaning, methods, types and elements of cost.	Up to K3
<b>CO2:</b>	Analysis the various techniques of Material control.	Up to K3
CO3:	Attain knowledge on the accounting Methods of Wage payments, Labour Turnover and Causes and Remedies	Up to K3
CO4:	Through knowledge of Primary and Secondary Distribution of Overhead, and Machine hour Rate.	Up to K4
CO5:	To gain the knowledge on budget and budgetary control and prepare various types of budgeting.	Up to K4

#### CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	2	2	1	2	2	3
CO 2	2	2	3	2	2	2
CO 3	2	3	2	2	2	2
CO 4	2	2	2	2	2	3
CO 5	2	2	3	2	2	2

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### **LESSON PLAN**

Unit	Course Name	Hrs	Pedagogy
I	Introduction: Definition of Costing – Objects & advantages of costing – Difference between Cost accounting & Financial accounting – Installation of costing system – Classification and analysis of costs – Specimen of Cost Sheet - Preparation of cost sheet (simple problems only)	18 Hrs	Black Board & PPT
п	Materials: Maintenance of stores & records -E.O.Q — Different Level of Stock(Reorder level, Maximum Level, Minimum Level, Average level and Danger Level) – Pricing of material issues (FIFO, LIFO)	18 Hrs	Black Board & PPT
ш	Labour: Labour Turn over – Methods of Remunerating Labour – Incentive Schemes- Halsey – Rowan & Taylor's Differential piece rate system (Simple problems Only).	18 Hrs	Black Board & PPT
IV	Overheads : Meaning – Classification – Allocation, Apportionment & Absorption of overheads - Primary and Secondary Distribution of Overhead – Machine Hour Rate (Simple problems Only).	18 Hrs	Black Board & PPT
v	Budget and Budgetary Control: Meaning – Objectives – Advantages – Limitations – Classification of Budgets – Preparation of Functional budgets – Material purchase budget, sales budget and Cash budget.	18 Hrs	Black Board & PPT

Course Designed by: Dr. N. Saraswathi & Dr.S.Pandeeswari

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print											
Articulation Mapping – K Levels with Course Outcomes (COs)												
				Section	n A	Section	B	a ( <b>•</b> a				
Inte	Co	s	K Level	MCC	)s	Short Answers		Section C Either or	Section D Open			
rnal	COS			No. of. Questions	K - Level	No. of. Questions	K - Level	Choice	Choice			
CI	CO	)1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO	2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO	3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO	4	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)			
0	4:0	No. of Questions to be asked		4		3		4	2			
Quest n Patte CIA	110	No. of Questions to be answered		4		3		2	1			
	I T		Marks for each question	1		2		5	10			
	.1	,	Total Marks for each section	4		6		10	10			

\*Note: It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

	Distribution of Marks with K Loval CIA L & CIA II												
	Distribution of Marks with K Level CIA I & CIA II												
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %					
	K1	2	2	-		4	8	20					
	K2	2	4	-	-	6	12						
СІА	K3	-	-	20	20	40	80	80					
I	K4	-	-	-	-	-	-	-					
-	Marks	4	6	20	10	50	100	100					
	K1	2	2	-		4	8	20					
CIA	K2	2	4	-	-	6	12						
	K3	_	-	10	10	20	40	40					
II	K4	_	_	10	10	20	40	40					
	Marks	4	6	20	20	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.

Summa	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)							
			MCC	)s	Short An	swers	Section C	Section D
S. No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	(Open Choice)
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
No. of Q	Questions	to be Asked	10		5		10	5
No.of Questions to be answered			10		5		5	3
Mark	s for eacl	n question	1		2		5	10
Total M	larks for	each section	10		10		25	30
(	Figures i	n parenthesis	s denotes, qu	estions sh	nould be ask	ed with	the given K l	evel)

	Distribution of Marks with K Level							
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5		-	-	5	4	16	
K2	5	10	-	-	15	12		
K3	-	-	30	30	60	50	50	
K4	-	-	20	20	40	34	34	
Marks	10	10	50	50	120	100	100	
NB: Hig	NB: Higher level of performance of the students is to be assessed by attempting higher level							
of K lev	els.							

Section	ı A (Mı	iltiple Cho	vice Questions)
Answe	r All Q	uestions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answei	rs)
Answe	r All Q	uestions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K1	
12	CO2	K1	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answe	r All Q	uestions	(5  x 5 = 25  marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3,K3	
16) b	CO1	K3,K3	
17) a	CO2	K3,K3	
17) b	CO2	K3,K3	
18) a	CO3	K3,K3	
18) b	CO3	K3,K3	
19) a	CO4	K4,K4	
19) b	CO4	K4,K4	
20) a	CO5	K4,K4	
20) b	CO5	K4,K4	
NB: Hi	gher le	vel of perf	formance of the students is to be assessed by attempting
higher	level of	f K levels	
Section	D (Op	en Choice	
Answe	r Any T	Three ques	tions (3x10=30 marks)
Q. No	CO	K Level	Questions
21	COI	K3	
22	CO2	K3	
23	CO3	K3	
24	CO4	K4	
<b>•</b> -	ac =	<b></b>	

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course	rse Name R Programming Lab								
Course	e Code	21U0	CASP4				L	Р	С
Catego	ory Skill - 2							2	2
Natur	re of Cou	irse:	EMPLOYABILITY	SKILLORIENTED	✓ E	NTRE	PREN	EU	RSHIP
COUR	COURSE OBJECTIVES:								
• • •	Expand Identify Manipul Explore Understa	R by in and de late stri and un and the	nstalling R packages eal with missing data ings in R aderstand how to use the different data types an	e R documentation d structures in R					
1	<ul> <li>Onderstand the different data types and structures in R</li> <li>Write an R program to take input from the user (name and age) and display the values. Also print the version of R installation.</li> <li>To create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 01.</li> </ul>							6 hrs	
3 4	Write an R program to get the first 10 Fibonacci numbers.To convert a given matrix to a 1 dimensional array.						6 hrs		
5	5 To create an array using four given columns, three given rows, and two given tables and display the content of the array.						6 hrs		
7 8	To To	create	a list containing strings number of objects in a g	, numbers, vectors and a given list.	logical	values.			6 hrs
9 10	To To	extract get the	3rd and 5th rows with structure of a given date	1st and 3rd columns from ta frame.	n a give	n data	frame	•	6 hrs
				r	Total Le	ecture	Hour	S	30
Web R	kesource	s:	m \ R \ R avaraisas						
1. <u>www</u> 2. <u>http</u> 3. http	://www.l s://spoke	andofe en-tuto	<u>code.com/R-exercises/</u> prial.org/tutorial-searc	h/?search_foss=R&sea	rch_lan	guage	=		
Course	e Outcor	nes						K	<b>Level</b>
At the	end of t	he cou	rse the students will be	e able to					
CO1:	Underst work.	tand ba	sic concepts such as da	ta type and index and use	e them in	n their			K2
<b>CO2:</b>	Demon	strate u	use of basic functions.						K3
CO3:	Understand, Analyze, Interpret Correlation and Regression to analyze the underlying relationships between different variables. <b>K2</b>						K2		
<b>CO4</b> :	Analyz	e and c	reate loops to solve diff	ferent types of problems.					K4
CO5:	Experin wide va	nenting riety o	g Probability and Proba f problems.	bility Distributions to so	olve a	_	_		K4

### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	2	2	2	2	3	2
CO 2	3	2	2	2	2	2
CO 3	2	1	3	2	2	2
<b>CO 4</b>	3	2	2	2	1	2
CO 5	2	3	1	3	2	2

\*3 –Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### **LESSON PLAN**

	List of Programs	Hrs	Pedag ogy
1 2	Write an R program to take input from the user (name and age) and display the values. Also print the version of R installation. To create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.	6 hrs	PPT
3 4	Write an R program to get the first 10 Fibonacci numbers. To convert a given matrix to a 1 dimensional array.	6 hrs	РРТ
5 6	To create an array using four given columns, three given rows, and two given tables and display the content of the array. To find the maximum and the minimum value of a given vector.	6 hrs	РРТ
7 8	To create a list containing strings, numbers, vectors and a logical values. To count number of objects in a given list.	6 hrs	РРТ
9 10	To extract 3rd and 5th rows with 1st and 3rd columns from a given data frame. To get the structure of a given data frame.	6 hrs	РРТ

Course Designed by Dr. R. Bagavathi Lakshmi & Mrs. R. Vasuki



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	MULTIMEDIA						
Course Code	21UCAN41				L	Р	С
Category	Non-Major Elective				2	-	2
Nature of cours	EMPLOYABILITY	✓	SKILL ORIENTED	ENTREPH	RENU	RSHI	P
Course Objecti	ves:						
• To und	rstand multimedia in respec	et to	many application includin	g business,	schoo	ols, ho	ome,
	l Ion multimodio skillo undo	noton	ding the principal playar	of indivi	dual	<b>1</b> 0.000	a in
• 10 deve multimed	lia teams in developing proje	rstan cts	ung the principal players	s of individ	uuai j	player	s m
To have	an introductory knowledge al	bout	text and graphics.				
• To will le	earn the cost involved in mult	timed	lia planning, designing, and	1 producing			
To intro	uce the concept of Digital Vi	ideo a	and animation.	1 0			
Unit: I Intr	oduction				5 ho	ours	
Objectives-Intro	duction to Multimedia -The	Mult	idimedia Market-Content	and Copyrig	ght –	Resou	rces
for Multimedia	levelopers.				1		
Unit: II Text					10 h	ours	
Elements of Tex	t –Text Data Files – Using T	ext i	n Multimedia Applications	s – Hyperte	xt – C	Fraph	ics:
Element of Grap	hics – Images and Color – C	iraph	ics File and Application F	ormats-Obt	annng	g Imag	ges
for Multimedia	Jse-Using Graphics in Multi	imed	a Applications		51		
Background on	Video Characteristics of $\Gamma$	Vigita	1 Video Digital Video D	ata cizina	J no Vide	urs	tura
and Playback sy	stems- Computer Animation	ngna -	i video – Digitai video D	ata sizing –	v lue	0 Cap	luie
Unit: IV Proc	uct Design				4hor	irs	
Building Blocks	- Classes of Products- Conte	nt O	rganizational Strategies- S	toryboardin	g		
Unit: V Mul	timedia and the Internet		<u> </u>		6 hou	ırs	
The Internet-H	ML and Web Authoring	–Mu	ltimedia Considerations f	for the Inte	ernet	– De	sign
Considerations f	or Web Pages						
			Total	Lecture H	ours	30 H	rs
<b>Books for Stud</b>	<b>y:</b>						
David Hillman,	MULTIMEDIA TECHNC	DLO	GY & APPLICATIONS,	Galgotia I	Public	ations	pvt
Ltd., New Delhi	, Reprinted 2014.			-			-
Unit I	- Chapters 1(Full)						
Unit II -	Chapters 4(Full), 5(Full)						
Unit III -	- Chapters 7(Full)						
Unit IV-	Chapters 8(Full)						
UNIT V	-Chapter 10(Full)						
<b>Books for Refe</b>	ences:						
1. Tay Vau	ghan, <b>Multimedia: Making</b>	It W	ork, Eighth Edition,MC g	raw hill pu	blishe	rs,	
printed I	993. nmata and Klana Nahustadt	N/Г14	imadia Systema V	muhlisham		ad <b>2</b> 0	04
2. Kall Stell 3 R Steint	nnetz anu Mara Nanrsteut, I netz Multimedia systems		nuting communication	.publishers	print, ations	eu 20	04.

	WorldCat publishers 1995.					
Web R	esources:					
1. http	s://onlinecourses.swayam2.ac.in/nou20_cs05/preview_					
2. <u>http</u>	s://www.geeksforgeeks.org/what-is-multimedia/					
3. http	s://www.tutorialspoint.com/multimedia/multimedia_introduction.htm					
Course	Course Outcomes K Level					
CO1:	Define multimedia to potential clients.	K2				
<b>CO2:</b>	Identify different media and its representations in data.	K2				
CO3:	Discuss various audio and video file formats.	K2				
CO4:	Explain basic components of multimedia products.	K2				
CO5:	Demonstrate the role of internet in multimedia applications.	K2				

# CO & PO Mapping:

COs	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	3	2	3	3
CO 2	2	2	3	2	2	3
CO 3	3	2	3	3	2	2
CO 4	2	3	2	3	2	3
CO 5	2	3	3	3	3	3

**\*3**-Advanced Application;**2**-Intermediate Development; **1**-IntroductoryLevel

### LESSON PLAN

UNIT	Introduction	Hrs	Pedagogy
Ι	Objectives-What is Multimedia?-The Multidimedia Market-Content and Copyright – Resources for Multimedia developers	5	Chalk & Talk, ICT Kit
Π	<b>Text</b> Elements of Text –Text Data Files – Using Text in Multimedia Applications – Hypertext – <b>Graphics:</b> Element of Graphics – Images and Color – Graphics File and Application Formats- Obtaining Images for Multimedia Use-Using Graphics in Multimedia Applications	10	Chalk & Talk, ICT Kit
III	Digital Video and Animation: Background on Video – Characteristics of Digital Video – Digital Video Data sizing – Video Capture and Playback systems- Computer Animation	5	Chalk & Talk, ICT Kit
IV	Product DesignBuilding Blocks- Classes of Products- Content OrganizationalStrategies- Storyboarding	4	Chalk & Talk, ICT Kit
V	Multimedia and the Internet The Internet-HTML and Web Authoring –Multimedia Considerations for the Internet – Design Considerations for Web Pages	6	Chalk & Talk, ICT Kit

Course Designed by: Mrs. R. Vasuki & Dr. R. Bagavathi Lakshmi





## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	OPERATING SYSTE	CM						
Course Code	21UCAC51					L	Р	С
Category	Core					6	-	4
Nature of course: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPREN							Р	✓
Course Objecti	ves:							
Discover	r the main components o	f an	Operating System an	d th	eir functions.			
<ul> <li>Analyze</li> </ul>	the process managemen	t an	d scheduling.					
Understa	and the concepts and in	nple	mentation of Memory	y m	anagement poli	cies a	nd v	irtual
memory								
• Assess t	the need for special pu	rpos	se operating system	wit l	h the advent of	new	eme	rging
technolo						00.	IDC	
• Examine	various issues in Inter I	roc	ess Communication ()	IPC nac	) and the role of	OS 11		Phas
Unit: I Int	What Is An Operating	<u> </u>	stem and Process Co.	nce	pis am Components	And		onrs als
Operating Syst	em Architecture Proc	, DJ	Concepts: Introducti	ion	- Process St	s Alle ates	1 00 - Pr	ais -
Management- I	terrupts - Interprocess (	lom	munication		1100035 50	acs	11	000055
Unit: II Asy	nchronous Concurrent	t Ex	ecution and Deadloc	k			18	hrs
Introduction - N	Jutual Exclusion - Impl	eme	enting Mutual Exclusi	on	Primitives - Sof	tware	Solu	tions
To The Mutual Exclusion Problem – Semaphores - Deadlock: Introduction - Four Necessary								
Conditions For	Deadlock - Deadlock	s So	olutions - Deadlock	Pre	vention - Dead	lock A	Avoi	lance
With Dijkstra's Banker's Algorithm - Deadlock Detection - Deadlock Recovery.								
Unit: III Pro	cessor Scheduling						18	hrs
Introduction -	Scheduling Levels - F	ree	mptive Vs Non-Pree	mpt	ive Scheduling	- Pri	oritie	s -
Scheduling Obj	ective - Scheduling Crite	eria	- Scheduling Algorit	hm	8.			
Unit: IV Rea	al Memory Organizatio	n A	nd Virtual Memory	Ma	nagement		18	hrs
Introduction -	Memory Organization	- N	Aemory Management	-	Memory Hierar	chy -	Me	mory
Management S	trategies - Contiguous	VS T	Non Contiguous Me	mor	y Allocation -	F1xed	l Par	tition
Multiprogramm	troduction Page Poplac	1	artition Multipro	grai nt S	tratagias	lai	Me	mory
Unit. V File	and Database Systems		ent - Fage Replacemen	in s	trategies.		19	hrs
Introduction -	Data Hierarchy – Files	, - F	ile System - File Or	pani	zation - File A	llocati	ion -	Free
Space Managen	nent - File Access Contro	ol.		5		nouu	.011	1100
				To	otal Lecture Ho	urs	90 H	rs
Books for Stud	y:							
1. H.M.Deitel,P	.J.Deitel,D.R.Choffnes,	Ope	rating System, Pearso	n E	ducation, Third	Editio	n, 20	11.
Unit I Chapter 1	: 1.1,1.2,1.12,1.13,							
Chapter 3	: 3.1 - 3.5							
Unit II Chapter	5: 5.1,5.2,5.3,5.4(up to 5	5.42)	),5.6					
Chapter	7: 7.1,7.5 - 7.10							
Unit III Chapter	8: 8.1 - 8.7							
Unit IV Chapter	: 9: 9.1 - 9.6,9.8,9.9							

Chapter11: 11.1,11.5,11.6

Unit V Chapter 13: 13.1 - 13.8

#### **Books for References:**

1. Pramod Chandra P.Bhatt, An Introduction to Operating Systems Concepts and Practice, PHI 2nd Edition, 2008.

2. Silberschatz A, Galvin P.B., Gange G, Operating System Concepts, John Wiley& Sons, INC, New Delhi, Sixth Edition, 2002.

3. Milan Milenkovic, Operating System Concepts and Design, Tata McGraw Hill, New Delhi, Third Edition, 1997

#### Web Resources:

- 1. <u>https://nptel.ac.in/downloads/106108101/</u>
- 2. http://williamstallings.com/Extras/OS-Notes/notes.html
- 3. https://www.tutorialspoint.com/operating\_system/operating\_system\_tutorial.pdf

Course	e Outcomes	K Level
At the	e end of the course, the students will be able to	
<b>CO1:</b>	Discover the evolution and basic components of operating system.	K3
CO2:	Demonstrate and Describe the concepts of process, operations, scheduling and deadlock.	К3
CO3:	Illustrate the concepts and implementations of Memory Management policies and virtual memory.	К3
<b>CO4:</b>	Apply the knowledge of Scheduling and Scheduling Algorithms.	K4
CO5:	Examine and Discuss the features of Disk Scheduling and Management.	K4

### CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	3	2	3	3	2
CO 2	2	3	3	3	3	3
CO 3	3	2	3	2	2	2
CO 4	2	2	2	2	3	2
CO 5	3	3	3	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	<b>Introduction to Operating System:</b> Introduction - What Is An Operating System- Operating System Components And Goals - Operating System Architecture. <b>Process Concepts:</b> Introduction - Process States - Process Management- Interrupts - Interprocess Communication	18Hrs	Chalk & Talk,ICT Kit
п	Asynchronous Concurrent Execution: Introduction - Mutual Exclusion -Implementing Mutual Exclusion Primitives - Software Solutions To The Mutual Exclusion Problem – Semaphores - Deadlock: Introduction - Four Necessary Conditions For Deadlock - Deadlock Solutions - Deadlock Prevention - Deadlock Avoidance With Dijkstra's Banker's Algorithm - Deadlock Detection - Deadlock Recovery.	18Hrs	Chalk & Talk,ICT Kit
ш	<b>Processor Scheduling:</b> Introduction - Scheduling Levels - PreemptiveVs Non-Preemptive Scheduling - Priorities - Scheduling Objective - Scheduling Criteria - Scheduling Algorithms.	18Hrs	Chalk & Talk,ICT Kit
IV	<b>Real Memory Organization:</b> Introduction - Memory Organization - Memory Management - Memory Hierarchy - Memory Management Strategies - Contiguous Vs Non Contiguous Memory Allocation - Fixed Partition Multiprogramming - Variable Partition Multiprogramming <b>Virtual Memory Management:</b> Introduction - Page Replacement - Page Replacement Strategies.	18Hrs	Chalk & Talk,ICT Kit
v	<b>File and Database Systems:</b> Introduction - Data Hierarchy – Files - File System - File Organization - File Allocation - Free Space Management - File Access Control.	18Hrs	Chalk & Talk,ICT Kit

# Course Designed by: Mrs. M. Muthulakshmi, & R.Vasuki Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print							
		Articulation N	/lapping – K	Levels w	vith Course C	outcome	s (COs)	
			Section	n A	Section	B	Section C	Section D
Inte	Cos	K I evel	MCQ	)s	Short Ans	swers	Fither or	Onen
rnal	CUS	K Level	No. of.	<b>K</b> -	No. of.	К-	Choice	Choice
			Questions	Level	Questions	Level	Choice	Choice
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AI	CO2	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)
CI	CO3	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)
		No. of Questions to be asked	4		3		4	2
Question Pattern		No. of Questions to be answered	4		3		2	1
	1 & 11	Marks for each question	1		2		5	10
		Total Marks for each section	4		6		10	10

	Distribution of Marks with K Level CIA I & CIA II								
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %	
	K1	2	-	-		2	4	20	
	K2	2	6	-	-	8	16	20	
СІА	K3	-	-	20	20	40	80	80	
	K4	-	-	-	-	-	-	-	
•	Marks	4	6	20	20	50	100	100	
	K1	2	-	-		2	4	20	
	K2	2	6	-	-	8	16	20	
CIA	K3	-	_	10	10	20	40	40	
II	K4	-	_	10	10	20	40	40	
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)									
			MOQ	2s	Short An	swers	Section C	Section D		
S.No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Entitler / or	(Open Choice)		
			Questions	Level	Question	Level	Choice)	Choice)		
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
No	of Quest	ions to be	10		5		10	5		
	Aske	ed	10		5		10	2		
No	.of Quest	ions to be	10		5		5	3		
	answe	red	10		2		3	5		
Marks for each question		1		2		5	10			
Total I	Marks for	each section	10		10		25	30		
	(Figures	in parenthesi	s denotes, qu	estions s	hould be as	ked with	the given K	level)		

	Distribution of Marks with K Level										
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %				
K1	5		-	-	5	4	16				
K2	5	10	-	-	15	12	10				
K3	-	-	30	30	60	50	50				
K4	-	-	20	20	40	34	34				
Marks	10	10	50	50	120	100	100				
NB: Hig of K lev	gher level of p els.	erformance o	of the students	s is to be asso	essed by a	attempting	higher level				

Section	Section A (Multiple Choice Questions)						
Answei	r All Q	uestions	(10x1=10 marks)				
Q.No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K2					
3	CO2	K1					
4	CO2	K2					
5	CO3	K1					
6	CO3	K2					
7	CO4	K1					
8	CO4	K2					
9	CO5	K1					
10	CO5	K2					
Section	B (She	ort Answer	rs)				
Answei	r All Q	uestions	(5x2=10 marks)				
Q.No	CO	K Level	Questions				
11	CO1	K2					
12	CO2	K2					
13	CO3	K2					
14	CO4	K2					
15	CO5	K2					
Section	C (Eit	her/Or Ty	pe)				
Answei	r All Q	uestions	(5  x 5 = 25  marks)				
Q.No	CO	K Level	Questions				
16) a	CO1	K3					
16) b	CO1	K3					
17) a	CO2	K3					
17) b	CO2	K3					
18) a	CO3	K3					
18) b	CO3	K3					
19) a	CO4	K4					
19) b	CO4	K4					
20) a	CO5	K4					
20) b	CO5	K4					
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher				
level of	K leve	ls					
Section	D (Op	en Choice)					
Answei	r Any T	Three ques	tions (3x10=30 marks)				
Q.No		K Level	Questions				
21	COI	K3					
22	CO2	K3					
23	CO3	K3					
24	CO4	K4					
25	CO5	K4					

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	COMPUTER NETW	OMPUTER NETWORKS						
Course Code	21UCAC52			L	Р	С		
Category	Core			6	-	4		
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENUI	RSH	IP	✓		
Course Objecti	ves:	· · ·						
To understand the concepts of computer networking basics.								
To know	• To know the various transmission media such as guided and unguided							
• To deve	lop and understanding	of different components, of	computer networks,	vari	lous			
protocol	S.	- d d						
• To analyz	the overall networking star	accurity in data communication	e protocols.					
Unit: I Int	aduction to Data Con	munications and Network			19	2		
Introduction -	Data Communications -	– Networks – The Internet –	Protocols and stand	ards		,		
Network Mode	s: Lavered tasks – The	e OSI Model – Lavers in the	OSI Model - TCP/I	P P1	rotoc	ol		
suite	b. Duyered tubils Th					01		
Unit: II Tra	nsmission Media				18	}		
Introduction-	Guided media – Unguid	led media – Other wireless I	Networks : Cellular '	Tele	phon	V –		
Satellite Networ	ks.				L	5		
Unit: III Err	or Detection and Cor	rection			18	3		
Introduction –	Block Coding – Linear	Block codes - Cyclic codes	s – Checksum – Dat	a Li	nk			
<b>Control</b> : Frami Noisy Channels	ng – Flow and Error Co -HDLC – Point to Poir	ontrol – Data Link Layer Pr nt Protocol	cotocols – Noiseless	Cha	nnels	8 –		
Unit: IV Net	work Layer				18	3		
Network Layer S	ervices – Packet Switchin	ng – IPV4 Addresses – Forwar	ding of IP packets- D	elive	ery –			
Forwarding - Uni	cast Routing Protocols -	Multicasting Routing Protoco	ols					
Unit: V Cry	ptography and Netwo	ork Security			18	8		
Introduction – S	Symmetric key Cryptog	graphy-Asymmetric key Cry	ptography- Security	Ser	vices	—		
Message Confid	entiality – Message Int	egrity – Message Authentica	ation – Digital Signa	iture		r		
			Total Lecture Hou	rs	90 H	lrs		
Books for Stud	y:							
Behrouz a For	ouzan, Data Commu	nications and Computer N	Networks, McGraw-	Hill	Pvt			
Ltd., New Delhi	, Fifth Edition, 2011							
UNIT I: Chap	oter 1 Section -1.1-1.4							
Cha	pter 2 Section -2.1-2.4							
UNIT II: Chap	ter 7 Section 7.1,7.2							
Chapter 16 Section - 16.1,16.2								
UNIT III: Chapter 10 Section 10.1-10.5								
Chap UNIT IV: Chap	ter 11 Section 11.1-11.	.ວ ງ						
UNIT IV: Unap	ter 20 Section 20.1.20	۲ ۸						
UNIT V. Chan	rer 20 Section 20.1-20.	. <del>т</del> Э.Д						
Unit V. Chap	22.50000122.1 - 22							

Chapter 31 Section 31.1-31.6

#### **Books for References:**

- 1. Andrew S.Tanebaum, Computer Networks, Prentice Hall of India, New Delhi, Fifth Edition 2014
- 2. Prakash C.Gupta, Data Communication and Computer Networks, Prentice Hall of India, New Delhi, Third Edition 2006.

### Web Resources:

- 1. https://www.journals.elsevier.com/computer-networks
- 2. <u>https://www.tutorialspoint.com/computer\_fundamentals/computer\_networking.html</u>
- 3. <u>https://www.guru99.com/types-of-computer-network.html</u>

Cour	se Outcomes	K Level
<b>CO1:</b>	Able to Understand the fundamental concepts of Computer Networking	K3
<b>CO2:</b>	Able to choose the transmission media	K3
CO3:	Able to understand the concepts of error detection and correction and working of protocols	К3
CO4:	Able to determine the network services, IPV4 addresses, unicast and multicasting protocols	K4
CO5:	Able to determine the services of network security	K4

#### CO & PO Mapping:

COS	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	PO 6
CO 1	1	1	1	1	1	1
CO 2	1	2	3	2	3	3
CO 3	1	2	2	3	3	3
CO 4	2	2	3	2	3	2
CO 5	1	2	2	2	3	2

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

Unit	Course Name	Hrs	Pedagogy
I	Introduction to Data Communications and Networks: Data Communications – Networks – The Internet – Protocols and standards – Network Models: Layered tasks – The OSI Model – Layers in the OSI Model - TCP/IP Protocol suite	18	Black Board/PPT
II	<b>Transmission Media: Introduction</b> – Guided media – Unguided media – Other wireless Networks : Cellular Telephony – Satellite Networks.	18	Black Board/PPT
ш	<b>Error Detection and Correction: Introduction</b> –Block Coding – Linear Block codes – Cyclic codes – Checksum – <b>Data Link Control</b> : Framing – Flow and Error Control – Data Link Layer Protocols – Noiseless Channels – Noisy Channels -HDLC – Point to Point Protocol	18	Black Board/PPT
IV	<b>Network Layer:</b> Network Layer Services – Packet Switching – IPV4 Addresses – Forwarding of IP packets- Delivery – Forwarding - Unicast Routing Protocols – Multicasting Routing Protocols	18	Black Board/PPT
V	<b>Cryptography and Network Security:</b> Introduction – Symmetric key Cryptography-Asymmetric key Cryptography- Security Services – Message Confidentiality – Message Integrity – Message Authentication – Digital Signature	18	Black Board/PPT

### LESSON PLAN

Course Designed by: M.Ramesh Kumar & Mrs M.Muthulakshmi Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)								
	Articulation Mapping – K Levels with Course Outcomes (COs)								
			Sectio	n A	Section	B B			
Inte			MCC	Qs	Short Ans	swers	Section C	Section D	
rnal	Cos	K Level	No. of. Question s	K - Level	No. of. Questions	K - Level	Either or Choice	Open Choice	
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AI	CO2	К3	2	K1.K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K3,K3)	1(K4)	
		No. of Questions to be asked	4		3		4	2	
Question Pattern		No. of Questions to be answered	4		3		2	1	
	1 & 11	Marks for each question	1		2		5	10	
		Total Marks for each section	4		6		10	10	

	Distribution of Marks with K Level CIA I & CIA II									
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %		
	K1	2	-	-	-	2	4	20		
	K2	2	6	-	-	8	16	20		
СТА	K3	-	-	20	20	40	80	80		
I	K4	-	-	-	-	-	-	-		
-	Marks	4	6	20	20	50	100	100		
	K1	2	-	-	-	2	4	20		
	K2	2	6	-	-	8	16	20		
CIA	K3	-	-	10	10	20	40	40		
II	K4	-	-	10	10	20	40	40		
	Marks	4	6	20	20	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)									
			MOQ	)s	Short Answers		Section C	Section	
S.No	COs	K - Level	No. of	No. of K – No. of K –		(Either / or	D (Open		
			Questions	Level	Question	Level	Choice)	Choice)	
1	CO1	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K3)	
2	CO2	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)	
3	CO3	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K3)	
4	CO4	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K4)	
5	CO5	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K4)	
No.	of Quest	tions to be	10				5	5	
	Aske	ed	10		5		5	5	
No	.of Quest	ions to be	10		L		5	2	
	answe	ered	10		5		5	3	
Marks for each question		1		2		5	10		
Total Marks for each section			10		10		25	30	
	(Figures	s in parenthes	is denotes, q	uestions	should be as	sked with	the given K le	vel)	

	Distribution of Marks with K Level								
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %		
K1	5	4	10	-	19	15.83	16		
K2	5	6	10	20	41	34.16	34		
K3	-	-	30	30	60	50	50		
K4	-	-	-	-	-				
Marks	10	10	50	50	120	100	100		
NB: Hig of K lev	NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.								

Section	Section A (Multiple Choice Questions)								
Answei	r All Q	uestions	(10x1=10 marks)						
Q.No	CO	K Level	Questions						
1	CO1	K1							
2	CO1	K2							
3	CO2	K1							
4	CO2	K2							
5	CO3	K1							
6	CO3	K2							
7	CO4	K1							
8	CO4	K2							
9	CO5	K1							
10	CO5	K2							
Section	B (She	ort Answer	rs)						
Answei	r All Q	uestions	(5x2=10 marks)						
Q.No	CO	K Level	Questions						
11	CO1	K1							
12	CO2	K1							
13	CO3	K2							
14	CO4	K2							
15	CO5	K2							
Section	C (Eit	her/Or Ty	pe)						
Answei	r All Q	uestions	(5  x 5 = 25  marks)						
Q.No	CO	K Level	Questions						
16) a	CO1	K1							
16) b	CO1	K1							
17) a	CO2	K3							
17) b	CO2	K3							
18) a	CO3	K2							
18) b	CO3	K2							
19) a	CO4	K3							
19) b	CO4	K3							
20) a	CO5	K3							
20) b	CO5	K3							
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher						
level of	K leve	ls							
Section	Section D (Open Choice)								
Answei	r Any T	Three ques	tions (3x10=30 marks)						
Q.No		K Level	Questions						
21	COI	K3							
22	CO2	K3							
23	CO3	K3							
24	CO4	K4							
25	CO5	K4							

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	LINUX LAB							
Course Code	21UCACP5					L	Р	С
Category	Core Lab					-	6	4
Nature of cours	EMPLOYABILITY	✓	SKILL ORIENTED	~	ENTREPRENU	JRSH	IP	<b>~</b>
Course Objecti	ves:							
<ul> <li>Write useful shell scripts which greatly and effectively enhance the usefulness of computers.</li> <li>Understand basics of various OS related concepts, from programmer's point of view.</li> <li>Develop applications where several processes need to communicate with each other to complete a task.</li> <li>Explain some of the different distribution of Linux and the reason for open source.</li> <li>Use Linux commands to manage files and file systems.</li> </ul>								
Cycle I	0		2				15	hrs
<ol> <li>Basic Com</li> <li>Number Cl</li> <li>Multiplicat</li> <li>Roman Let</li> </ol>	mands in Linux. lecking in Linux ion Table in Linux. ter Conversion in Linuy	ζ.						
Cycle II							15	hrs
6. File Opera 7. Directory ( 8. Directory (	ions in Linux- Create, ( )perations in Linux- Cr )perations in Linux : Co	Copy eate,	y, Delete, Rename Remove, Toggle Move					
Cycle III							15	hrs
9. Write a pro 10. Listing th 11. Changing 12. Counting	gram to emulate the Un e files regarding their n the access rights in Lin number of users curren	nix Is ames iux. tly lo	s —I command. s in Linux. ogged in Linux.					
Cycle IV	1						15	hrs
13. List of fil 14. Counting 15. Fibonacc 16. Checking	number of lines, words i series in shell scriptin odd or even in shell sc	ghts s and g. riptii	In Linux. I characters in a file in I	Lini	ux			
Cycle V		1	0				15	hrs
17. List all of 18. Find facto 19. Count the 20. Find the n	the directory files in a rial of a given integer. number of lines in a fil umber of characters, w	direc e tha ords	ctory. at do not contain vowel and lines in a file.	s.				
				Tot	tal Lecture Ho	urs	60 H	rs
Web Resources	•	<u> </u>						
1. <u>http</u> 2. <u>http</u>	://nptel.ac.in/courses/ ://www.guru99.com/n	117/: nust-	<u>106/117106113/</u> • <u>know-linux-comman</u>	<u>ds.</u>	<u>ntml</u>			

3. <u>https://www.tutorialspoint.com/unix/unix-quick-guide.htm</u>

Course	Course Outcomes				
At the	end of the course the students will be able to				
CO1.	Associate the student setup users and groups, Configure user defaults, logins	к2			
COI.	and user profiles.	112			
CO2.	Use UNIX/Linux system to accomplish typical personal, office, technical, and	K3			
CO2.	software development tasks.	KJ			
<b>CO3:</b>	Illustrate simple file processing operations and use UNIX/Linux utilities	K3			
<b>CO4:</b>	Classify directory structures with appropriate security,	K4			
<b>CO5:</b>	Examine shell scripts to perform more complex tasks.	<b>K</b> 4			

## CO & PO Mapping:

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COS	PO 1	<b>PO 2</b>	<b>PO 3</b>	PO 4	PO 5	PO 6
CO 1	3	3	3	2	3	3
CO 2	2	2	3	3	3	2
CO 3	2	2	2	3	2	2
CO 4	2	2	2	2	2	2
CO 5	3	2	2	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Cycle	LINUX LAB	Hrs	Pedagogy
I	Basic Commands in Linux. Number Checking in Linux Multiplication Table in Linux. Roman Letter Conversion in Linux.	12	Black Board, Lab Demonstration and LCD Projector.
п	Checking File or Directory in Linux. File Operations in Linux- Create, Copy, Delete, Rename Directory Operations in Linux- Create, Remove, Toggle Directory Operations in Linux : Copy, Move	12	Black Board, Lab Demonstration and LCD Projector.
III	Write a program to emulate the Unix Is —I command. Listing the files regarding their names in Linux. Changing the access rights in Linux. Counting number of users currently logged in Linux.	12	Black Board, Lab Demonstration and LCD Projector.
IV	<ul> <li>List of files having full access rights in Linux.</li> <li>Counting number of lines, words and characters in a file in Linux</li> <li>Fibonacci series in shell scripting.</li> <li>Checking odd or even in shell scripting</li> </ul>	12	Black Board, Lab Demonstration and LCD Projector.
V	List all of the directory files in a directory. Find factorial of a given integer. Count the number of lines in a file that do not contain vowels. Find the number of characters, words and lines in a file.	12	Black Board, Lab Demonstration and LCD Projector.

Course Designed by: Mrs. M. Muthulakshmi & V.Bhavani Assistant Professor



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	DATA MINING ANI	) W	AREHOUSING						
Course Code	21UCAE51					L	Р	С	
Category	Core					5	-	5	
Nature of cours	e: EMPLOYABILITY	✓	SKILL ORIENTED	✓	ENTREPRENU	JRSH	IP	✓	
Course Objecti	ves :				·				
Understa	Understand Data Warehouse fundamentals, Data Mining Principles								
• Design I	• Design Data warehouse with dimensional modeling and apply OLAP operations.								
• Identify	• Identify appropriate data mining algorithms to solve real world problems.								
Compare	e and evaluate different	data	mining techniques like	e cla	assification, pre-	dictio	n		
Clusterir	ng and Association Rule	mir	ning						
Describe	complex data types with r	espe	ect to spatial and web mi	inin	g				
Unit: I Dat	a Warehousing :						<b>15</b> ł	nrs	
Introduction –	Data warehouse Arch	nitec	ture – Dimensional	mo	delling – Cate	egoriz	atior	n of	
hierarchies – A	Aggregate function – S	Sum	marisability – OLAP	0	perations – OI	LAP	Serve	er –	
Coalescing – DV	WARF – Data Marting –	- Da	ta Cleaning – Cloud D	ata	Warehousing.				
Unit: II Dat	a Mining:						15ł	ırs	
What is Data M	ining? – Data Mining D	Defir	nitions – KDD vs Data	M	ining – DBMS	vs DN	$\Lambda - c$	other	
related areas -	DM techniques - Other	r M	ining problems – Issu	es a	and challenges	in D	М –	DM	
application areas	s – DM applications – C	lase	studies						
Unit: III Ass	ociation Rules.						<b>15</b>	nrs	
What is an As	ssociation Rule - Meth	ods	to discover Associat	ion	rules - Aprior	ri alg	orith	m –	
Partition algorit	thm – Rapid Associat	ion	Rule Mining (RARI	M)	– Incremental	Alg	orithi	n –	
Association Rul	es with Item Constraints	5							
Unit: IV Clu	stering Techniques:						15ł	nrs	
Clustering Parad	digms - Partitioning alg	oritl	hms – Kmedoid Algor	ithr	ns – CLARA –	CLA	RAN	<b>IS</b> –	
Hierarchical clu	stering DB scan – Categ	goric	cal Clustering algorithm	n –	STIRR. Decisio	on tre	es: V	Vhat	
is a Decision tre	e? – Tree construction p	rinc	iple – Best split – Spli	ttin	g indices – Split	tting	Crite	ria –	
Decision tree co	nstruction algorithms –	CA	RT – ID3-C4.5				-		
Unit: V We	b Mining						15ł	ırs	
Introduction –	Web Mining – We cont	ent	mining – Web structur	re r	nining – Web u	sage	minii	ng –	
Text Mining- U	Instructured text – Tex	t C	lustering – Temporal	Da	ata Mining: -1	empo	oral I	Data	
Mining and its	Association Rules – S	equ	ence Mining – Spatia	I M	lining and its t	asks	– Sp	atial	
Clustering.				-					
				10	tal Lecture Ho	urs	751	Irs	
Books for Stud	<b>y:</b>								
Arun K. Pujari,	Data mining techniques,	, Un	iversities Press, Third	edit	ion, Hyderabad	, 2013	3.		
Unit 1: Chapter	2 Section 2.1-2.6, 2.8,2	.10,2	2.17-2.18,2.22,2.24,2,2	26					
Unit 2: Chapter	3 Section 3.2-3.11								
Unit 3: Chapter	r 4 Section 4.2-4.5,4.10,	4.12	2						
Unit 4: Chapter	r 5 Section 5.2-5.8,5.11,	5.12	2 Chapter 6 Section 6.2	-6.1	10				
Unit 5: Chapter	11 Section 11.1-11.7, 1	1.10	Chapter 12 Section 12	2.2	– 12.4, 12.12 –	12.14			

#### **Books for References:**

1. M. H. Dunham, Data Mining: Introductory and Advanced Topics, Pearson Education, New Delhi, 2001.

2. D. Hand, H. Mannila and P. Smyth, Principles of Data Mining, Prentice-Hall, New Delhi, 2001 Web Resources:

https://www.tutorialspoint.com/dwh/index.htm https://www.guru99.com/data-warehousing-tutorial.html https://www.javatpoint.com/data-mining-techniques **Course Outcomes** K Level Determining the characteristics of Data Warehouse CO1: **K3** Integrating Data Mining techniques and other related areas **CO2: K3** Implementing Association Rules and various algorithms CO3: **K3** compare several newer algorithms for Clustering techniques in Data Mining **CO4: K4** CO5: Analyzing Web mining & Spatial Mining Techniques **K4** 

#### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	PO 5	<b>PO 6</b>
CO 1	3	2	2	2	2	2
CO 2	3	3	2	2	2	2
CO 3	2	2	3	3	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	3	2	2	1	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	Introduction – Data warehouse Architecture – Dimensional modelling – Categorization of hierarchies – Aggregate function – Summarisability – OLAP operations – OLAP Server – Coalescing – DWARF – Data Marting – Data Cleaning – Cloud Data Warehousing.	15	PPT Chalk & Talk
II	What is Data Mining? – Data Mining Definitions – KDD vs Data Mining – DBMS vs DM – other related areas - DM techniques – Other Mining problems – Issues and challenges in DM – DM application areas – DM applications – Case studies	15	РРТ
III	What is an Association Rule – Methods to discover Association rules – Apriori algorithm – Partition algorithm – Rapid Association Rule Mining (RARM) – Incremental Algorithm – Association Rules with Item Constraints	15	ICT Tools
IV	Clustering Paradigms - Partitioning algorithms – Kmedoid Algorithms – CLARA – CLARANS – Hierarchical clustering DB scan – Categorical Clustering algorithm – STIRR. <b>Decision trees:</b> What is a Decision tree? –Tree construction principle – Best split – Splitting indices – Splitting Criteria – Decision tree construction algorithms – CART – ID3-C4.5	15	Chalk & Talk&PPT
V	Introduction – Web Mining – We content mining – Web structure mining – Web usage mining – Text Mining- Unstructured text – Text Clustering – <b>Temporal Data Mining:</b> -Temporal Data Mining and its Association Rules – Sequence Mining – Spatial Mining and its tasks – Spatial Clustering.	15	ICT

Course Designed by: Mrs.V.Bhavani and G.Mahalakshmi, Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)										
Inte rnal	Cos	K Level	I Section A MCQs No. of. K Questions Le		Section B Short Answers No. of. K - Ouestions Level		Section C Either or Choice	Section D Open Choice			
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	K3	2	K1.K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K3,K3)	1(K4)			
		No. of Questions to be asked	4		3		4	2			
Question Pattern		No. of Questions to be answered	4		3		2	1			
CIA	1 & 11	Marks for each question	1		2		5	10			
		Total Marks for each section	4		6		10	10			

Distribution of Marks with K Level CIA I & CIA II									
	K Level	Section A (Multiple Choice Ouestions)	Section B (Short Answer Ouestions)	BSection Ct(Either / OrerOr Choice)		Total Marks	% of (Marks without choice)	Consolidate of %	
	K1	2	•	-	-	2	4	20	
CIA I	K2	2	6	-	-	8	16		
	K3	-	-	20	20	40	80	80	
	K4	-	-	-	-	-	-	-	
	Marks	4	6	20	20	50	100	100	
	K1	2	-	-	-	2	4	20	
	K2	2	6	-	-	8	16	20	
CIA	K3	-	-	10	10	20	40	40	
II	K4	-	-	10	10	20	40	40	
	Marks	4	6	20	20	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)									
	COs	K - Level	MOQs		Short Answers		Section C	Section	
S.No			No. of K –		No. of	<b>K</b> –	(Either / or	D (Open	
			Questions	Level	Question	Level	Choice)	Choice)	
1	CO1	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K3)	
2	CO2	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)	
3	CO3	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K3)	
4	CO4	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K4)	
5	CO5	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K4)	
No. of Questions to be			10	5			5	5	
Asked					3		5	3	
No.of Questions to be			10	5			5	3	
answered			10		3	5			
Marks for each question			1		2		5	10	
Total Marks for each section			10		10		25	30	
(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 (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5	4	10	-	19	15.83	16	
K2	5	6	10	20	41	34.16	34	
K3	-	-	30	30	60	50	50	
K4	-	-	-	-	-			
Marks	10	10	50	50	120	100	100	
NB: Higher level of performance of the students is to be assessed by attempting higher level								

NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.
Section	Section A (Multiple Choice Questions)						
Answei	r All Q	uestions	(10x1=10 marks)				
Q.No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K2					
3	CO2	K1					
4	CO2	K2					
5	CO3	K1					
6	CO3	K2					
7	CO4	K1					
8	CO4	K2					
9	CO5	K1					
10	CO5	K2					
Section	B (She	ort Answer	rs)				
Answei	r All Q	uestions	(5x2=10 marks)				
Q.No	CO	K Level	Questions				
11	CO1	K1					
12	CO2	K1					
13	CO3	K2					
14	CO4	K2					
15	CO5	K2					
Section	C (Eit	her/Or Ty	pe)				
Answei	r All Q	uestions	(5 x 5 = 25 marks)				
Q.No	CO	K Level	Questions				
16) a	CO1	K1					
16) b	CO1	K1					
17) a	CO2	K3					
17) b	CO2	K3					
18) a	CO3	K2					
18) b	CO3	K2					
19) a	CO4	K3					
19) b	CO4	K3					
20) a	CO5	K3					
20) b	CO5	K3					
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher				
level of	K leve	ls					
Section	D (Op	en Choice)					
Answei	$\frac{r \text{ Any '}}{CC}$	Three ques	tions (3x10=30 marks)				
<b>Q.No</b>		K Level	Questions				
21		K3					
22	<u>CO2</u>	K3					
23	<u>CO3</u>	K3					
24	<u>CO4</u>	K4					
25	005	К4					

# **Summative Examinations - Question Paper – Format**



MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name SOFTWA	ARE PROJE	СТ	MANAGEMENT					
Course Code 21UCAE	52					L	Р	C
Category Core						5	-	5
Nature of course: EMPLO	<b>YABILITY</b>	✓	SKILL ORIENTED	✓	ENTREPRENU	JRSH	IP	✓
Course Objectives:								•
• Define the scope of	f software Pro	ject	Management					
<ul> <li>Understand some problems and concerns of software Project Managers</li> </ul>								
• Explain the main el	lements of the	rol	e of Management					
Appreciate the need	d for careful p	lanı	ning, monitoring and co	onti	ol			
• Define the success	criteria for a H	Proj	ect					
Unit: I Introduction	to Software P	Proj	ect Management				15	5hrs
Introduction – project – s	software proje	ect v	vs other types of project	ct-a	ctivities covere	d by	softv	vare
project management-plan,	methods and	me	ethodologies – catego	rizi	ing software p	roject	s-pro	oject
charter-stakeholder-setting	; objectives-	Pro	oject Evaluation and	ł p	orogramme M	anage	emen	nt –
Evaluation of individual pr	ojects-Cost be	enet	fit Evaluation technique	es -	- Risk Evaluatio	n		
Unit: II Overview of p	project planni	ing					15	5hrs
Introduction to stepwise project planning-select project-identify project scope and objectives-								
identify project infrastructu	ure-analyse pr	oje	ct characteristics-identi	ify	project products	s and	activi	ities
-estimate effort for each a	activity-identif	fy a	ctivity risks-allocate r	eso	urces-review/pu	ıbliciz	ze pla	an –
execute plan/lower levels	of planning –	Sele	ection of an appropria	ate	project approa	nch: (	Choic	e of
process models-The water	fall model-spir	ral 1	model-software prototy	pin	g			
Unit: III Software Effo	ort Estimation	n					15	5hrs
Introduction – The basics	for software	esti	mating-software effort	es	timation technic	ques -	– bot	tom
up estimating-top down	approach-Exp	ert	Judgement -COCOM	0]	II:A parametrie	c pro	ducti	ivity
Model – Activity Plann	ing: Objectiv	itie	s of activity planning	g-Pı	oject schedules	s-proj	ects	and
activities-sequencing and s	scheduling act	iviti	ies-Network planning 1	noc	lel			
Unit: IV Risk Manager	ment						15	Shrs
Risk Management Appro	oaches- A fr	ame	ework for dealing wi	ith	risk-Risk iden	tificat	ion-I	Risk
Assessment-Risk plannin	ng-Risk Ma	nag	ement-Resource All	oca	tion-Nature of	of re	esour	ces-
Identifying Resource Requ	irements-Sche	edu	ling Resources-Creatin	g ci	ritical path			
Unit: V Monitoring a	nd Control						15	Shrs
Creating the framework-co	ollecting the o	lata	-Review-Visualizing p	prog	gress-Cost Mon	itoring	g-Eaı	rned
value Analysis-Prioritizing	g Monitoring-	Wc	orking in Teams-Beco	min	g a Team-Dec	ision	Mak	ing-
Organization and Team S	structures-Sof	twa	re Quality-The place	of	Software Qua	lity ir	1 Pro	oject
Planning-Importance of So	offware Qualit	y-L	Defining Software Qual	lity	-Techniques to	help	enha	ance
Software Quality				<b>TF</b>				
Total Lecture Hours     75 Hrs								
Books for Study:								
Text Book: Bob Hughes	s, Mike Cottre	ell, F	Rajib Mall, SOFTWAR	RE I	PROJECT MAN	NAGE	EME	NT,
Mc GRAW HILL.								

**UNIT-I :** Chapter 1.1 - 1.17, 2.1 – 2.13, 3.1 – 3.11

UNIT-	<b>II</b> : Chapter $4.1 - 4.19, 5.1 - 5.17, 6.1 - 6.16$	
UNIT-	<b>III</b> : Chapter $7.1 - 7.14$ , $8.1 - 8.10$ , $9.1 - 9.11$	
UNIT	<b>-IV</b> : Chapter 10.1 – 10.6, 11.1 – 11.11, 12.1 – 12.9	
UNIT-	<b>V</b> : Chapter $13.1 - 13.14$ , $14.1 - 14.5$	
Books	for References:	
1.Stellı	nan, Andrew; Greene, Jennifer (2005). Applied Software Project Management	
2.Richa	ard H. Thayer, Edward Yourdon . Software Engineering ProjectManagement	
3.Flem	ing, Quentin . Earned Value Project Management (Third Editioned.).	
Web R	lesources:	
ht	tp://www.google.com	
ht	tp://www.tutorialspoit.com	
ht	p://www.slideshare.com	
Cour	se Outcomes	K Level
At the	end of the course, the students will be able to	
CO1:	Define the scope of Software Project Management and usual stages of a	V2
	software project	КJ
<b>CO2</b> :	Evaluate the business risk involved in a project	K3
<b>CO3:</b>	Determine an appropriate process model	K3
<b>CO4:</b>	Examine the resource required for a project	K4
CO5:	Evaluate the quality of software project	K4

# CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	2	2	2
CO 2	3	3	2	2	2	2
CO 3	2	2	3	3	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	3	2	2	1	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	<b>Introduction</b> – project – software project vs other types of project- activities covered by software project management-plan, pmethods and methodologies – categorizing software projects-project charter- stakeholder-setting objectives- <b>Project Evaluation and programme</b> <b>Management</b> – Evaluation of individual projects-Cost benefit Evaluation techniques – Risk Evaluation	15	Black Board/PPT
п	Introduction to stepwise project planning-select project-identify project scope and objectives-identify project infrastructure-analyse project characteristics-identify project products and activities –estimate effort for each activity-identify activity risks-allocate resources- review/publicize plan –execute plan/lower levels of planning – <b>Selection of an appropriate project approach</b> : Choice of process models-The waterfall model-spiral model-software prototyping	15	Black Board/PPT
ш	Introduction –The basics for software estimating-software effort estimation techniques – bottom up estimating-top down approach- Expert Judgement –COCOMO II:A parametric productivity Model – <b>Activity Planning</b> : Objectivities of activity planning-Project schedules-projects and activities-sequencing and scheduling activities- Network planning model	15	Black Board/PPT
IV	Risk Management Approaches- A framework for dealing with risk- Risk identification-Risk Assessment-Risk planning-Risk Management- <b>Resource Allocation</b> -Nature of resources-Identifying Resource Requirements-Scheduling Resources-Creating critical path	15	Black Board/PPT
V	Monitoring and control - Creating the framework-collecting the data- Review-Visualizing progress-Cost Monitoring-Earned value Analysis- Prioritizing Monitoring-Working in Teams-Becoming a Team- Decision Making-Organization and Team Structures- <b>Software</b> <b>Quality</b> -The place of Software Quality in Project Planning-Importance of Software Quality-Defining Software Quality –Techniques to help enhance Software Quality	15	Black Board/PPT

# Course Designed by: M.Ramesh Kumar & R.Vasuki Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print Articulation Manning – K Levels with Course Outcomes (COs)									
			Section	n A	Section	B				
Into			MCO	Qs	Short Ans	swers	Section C	Section D		
rnal	Cos	K Level	No. of. Question s	K - Level	No. of. Questions	K - Level	Either or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	K3	2	K1.K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
		No. of Questions to be asked	4		3		4	2		
Question Pattern		No. of Questions to be answered	4		3		2	1		
	I & II	Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

	Distribution of Marks with K Level CIA I & CIA II										
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
СТА	K3	-	-	20	20	40	80	80			
I	K4	-	-	-	-	-	-	-			
-	Marks	4	6	20	20	50	100	100			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
CIA	K3	-	-	10	10	20	40	40			
II	K4	-	-	10	10	20	40	40			
	Marks	4	6	20	20	100	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)									
			MOQs		Short A	nswers	Section C	Section	
S.No	COs	K - Level	No. of	K –	No. of	К –	(Either / or	D (Open	
			Questions	Level	Question	Level	Choice)	Choice)	
1	CO1	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K2)	
2	CO2	K3	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)	
3	CO3	K3	2	K1,K2	1	K1,K2	2(K2&K2)	1(K2)	
4	CO4	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)	
5	CO5	K4	2	K1,K2	1	K1,K2	2(K3&K3)	1(K3)	
No.	of Quest	tions to be	10		5		5	5	
	Aske	ed	10		5		5	5	
No	.of Quest	ions to be	10		5		5	3	
	answe	ered	10		5		5	3	
Marks for each question		1		2		5	10		
Total N	Marks for	each section	10		10		25	30	
	(Figures	s in parenthes	is denotes, q	uestions	should be as	sked with	the given K le	vel)	

Distribution of Marks with K Level										
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %			
K1	5	4	10	-	19	15.83	16			
K2	5	6	10	20	41	34.16	34			
K3	-	-	30	30	60	50	50			
K4	-	-	-	-	-					
Marks	10	10	50	50	120	100	100			
NB: Higher level of performance of the students is to be assessed by attempting higher level										
of K lev	els.									

Section	Section A (Multiple Choice Questions)						
Answei	r All Q	uestions	(10x1=10 marks)				
Q.No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K2					
3	CO2	K1					
4	CO2	K2					
5	CO3	K1					
6	CO3	K2					
7	CO4	K1					
8	CO4	K2					
9	CO5	K1					
10	CO5	K2					
Section	B (She	ort Answer	rs)				
Answei	r All Q	uestions	(5x2=10 marks)				
Q.No	CO	K Level	Questions				
11	CO1	K1					
12	CO2	K1					
13	CO3	K2					
14	CO4	K2					
15	CO5	K2					
Section	C (Eit	her/Or Ty	pe)				
Answei	r All Q	uestions	(5  x 5 = 25  marks)				
Q.No	CO	K Level	Questions				
16) a	CO1	K3					
16) b	CO1	K3					
17) a	CO2	K3					
17) b	CO2	K3					
18) a	CO3	K3					
18) b	CO3	K3					
19) a	CO4	K4					
19) b	CO4	K4					
20) a	CO5	K4					
20) b	CO5	K4					
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher				
level of	K leve	ls					
Section	D (Op	en Choice)					
Answei	r Any 'l	Inree ques	uons (3x10=30 marks)				
<b>Q.No</b>		K Level	Questions				
21		K2 K2					
22	CO2	K3 K2					
23	CO3	K2 K2					
24	CO4	K3 K2					
23	005	K3					

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	INTERNET OF THI	NGS							
Course Code	21UCAE53			L	P	С			
Category	Core Elective			5	-	5			
Nature of cours	e: EMPLOYABILITY	SKILL ORIENTED	✓ ENTREPRENU	RSHI	P				
Course Objecti	ves:								
To descr	• To describe what IoT is and how it works today								
• To understand the application areas of IOT									
To under	• To understand building blocks of Internet of Things and characteristics								
<ul> <li>To realize</li> </ul>	e the revolution of Inte	rnet in Mobile Devices, Clo	oud & Sensor Netw	orks	•				
<ul> <li>To desig</li> </ul>	n and program IoT dev	ice							
Unit: I Int	oduction to Internet of	of Things			15	5			
Introduction - I	Physical Design of Io	Γ- logical Design of IoT-	IoT Enabling Tec	chnolo	ogies	-IoT			
Levels & Deplo	yment Templates								
Unit: II IoT	<b>Physical Devices &amp; E</b>	ndpoints			15	5			
What is an IoT l	Device- Basic building	blocks of an IoT Device.Do	omain Specific IoT	s:Int	roduc	tion			
– Home Automa	tion- Cities-Environme	ent–Energy– Retail-Logisti	cs-Agriculture-Indu	ustry-	Healt	h &			
Lifecyce									
Unit: III IoT	<u>17</u>								
Introduction – I	M2M – Difference bety	ween IoT and M2M – SD	N and NFV for Io	T. <b>Io</b> ]	ſ Sys	tem			
Management v	vith NETCONF-YAN	G :Need for IoT Systems	Management - Si	mple	Netv	vork			
Management Pr	otocol (SNMP) – Net	work Operator Requirement	nts – NETCONF -	- YA	NG -	-IoT			
Systems Manag	ement with NETCONF	– YANG							
Unit: IV IoT	Platforms Design Me	thodology			13	\$			
Introduction -	loT Design Methodol	ogy – Purpose & Requir	ements Specificat	ion –	Pro	cess			
Specification –	Domain Model Spe	cification – Information	Model Specificati	on –	Ser	vice			
Specifications -	IoT Level Specificat	ion – Functional View Sp	ecifications – Ope	eration	nal V	iew			
Specification –	Device & Component I	ntegration – Application De	evelopment.						
Unit: V Dat	a Analytics for IoT				15	,			
Introduction-Ap	ache Hadoop-Using Ha	doop MapReduce for Batcl	h Data Analysis-Ap	bache	Oozi	e-			
Apache Spark-A	pache Storm								
			Total Lecture Ho	urs	75H	rs			
Books for Stud	y:								
1. ArshdeepBa Press (India)	hga, Vijay Madisetti, Private Limited New I	"Internet of Things - A l	Hands on Approac	h", U	Jnive	rsity			
Unit I · Chapter	$1 \cdot 1 \cdot 1_{-1} \cdot 1_{-5}$	Jenn,2014							
Unit II · Chapter	··7·7 1 Chanter 2·2 1_2	-10							
Unit III: Chapte	: 3 : 3 = 34-Chapter 4	1.4 1 - 4.6							
Unit IV: Chapte	r 5-5.1.5.2								
Unit V : Chapte	10-10.1-10.6								
Books for Refe	rences:								
4. Jan Holler	VlasiosTsiatsis Cather	rine Mulligan, Stefan Aves	and. StamatisKarn	ousko	os. D	avid			
		guil, stoluli 1100		- ~ ~ M	, •				

Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1st Edition, Academic Press, 2014.

- 5. Francis da Costa, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1 st Edition, A Press Publications, 2013.
- 6. RajKamal,"Internet of Things Architecture and Design Principles", McGraw Hill,Fourth Edition, 2019.

#### Web Resources: 1.https://www.guru99.com/iot-tutorial.html 2.https://www.edureka.co/blog/iot-tutorial/ 3.https://youtube.com/watch?v=h0gWfVCSGQQ **Course Outcomes** K Level At the end of the course, the students will be able to **CO1:** Determine the IoT networking components with respect to OSI layer **K3** Discover about IoT applications and various sensors **CO2: K3** Illustrate the IoT protocols and software **CO3: K3** Classify the IoT design methodology and its components CO4: K4 **CO5:** Distinguish about various data analyticsin IoT **K4**

#### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	PO 5	PO 6
CO 1	3	2	2	2	2	2
CO 2	3	3	2	2	2	2
CO 3	2	2	3	3	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	3	2	2	1	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	<b>Introduction to Internet of things</b> : Introduction - Physical Design of IoT logical Design of IoT- IoT Enabling Technologies-IoT Levels & Deployment Templates: IoT Level 1- IoT Level 2- IoT Level 3- IoT Level 4- IoT Level-5 IoT Level -6.	15	Chalk & Talk, ICT Kit
п	<b>IoT physical devices and endpoints blocks of an IoT Device:</b> What is an IoT device- Basic building blocks of an IoT Device <b>Domain Specific</b> <b>IoTs:</b> Introduction – Home Automation- Cities–Environment –Energy – Retail- Logistics-Agriculture.	15	Chalk & Talk, ICT Kit
III	<b>IoT and M2M:</b> Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT. <b>IoT System Management with NETCONF</b> : YANG – Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Limitations of SNMP – Network Operator Requirements – NETCONF – YANG –IoT Systems Management with NETCONF – YANG.	17	Chalk & Talk, ICT Kit
IV	<b>IoT Platforms Design Methodology</b> : Introduction - IoT Design Methodology – Introduction – IoT Design Methodology – Purpose and Requirements Specification – Process Specification – Domain Model Specification – Information Model Specification – Service Specifications – IoT Level Specification – Functional View Specifications – Operational View Specifications – Device & Component Integration – Application Development.	13	Chalk & Talk, ICT Kit
v	<b>Data Analytics for IoT:</b> Introduction-Apache Hadoop-Using Hadoop MapReduce for Batch Data Analysis-Apache Oozie-Apache Spark- Apache Storm.	15	Chalk & Talk, ICT Kit

# Course Designed by: Mrs.R.Vasuki & Mrs M.Muthulakshmi

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section	n A	Sectio	n B				
Inte			MCQ	<u>)</u> s	Short An	swers	Section C	Section D		
rnal	Cos	K Level	No. of. Questions	K - Level	No. of. Question s	K - Level	Either or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
Question Pattern		No. of Questions to be asked	4		3		4	2		
		No. of Questions to be answered	4		3		2	1		
	1 & 11	Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

\*Note: It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

	Distribution of Marks with K Level CIA I & CIA II										
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
	K3	-	-	20	20	40	80	80			
CIA I	K4	-	-	-	-	-	-	-			
	K5	-	-	-	-	-	-	-			
	Marks	4	6	20	20	50	100	100			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
	K3	_	_	10	10	20	40	40			
CIA II	K4	-	-	10	10	20	40	40			
	K5	-	-	-	-	-	-	-			
	Marks	4	6	20	20	50	100	100			

K1- Remembering and recalling facts with specific answers

 $\ensuremath{\mathbf{K2}}\xspace$  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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)									
			MOQ	)s	Short An	swers	Section C	Saatian D		
S.No	COs	s K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or	(Open Choice)		
			Questions	Lever	Question	Lever	Choice)	choice)		
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
No	of Quest. Aske	tions to be ed	10	K1,K2	5	K2	10	5		
No.of Questions to be answered		10	K1,K2	5	K2	5	3			
Marks for each question			1	K1,K2	2	K2	5	10		
Total Marks for each section			10	K1,K2	10	K2	25	30		
	(Figures	in narenthesi	is denotes au	lestions s	hould be as	ked with	the given K	level)		

Distribution of Marks with K Level											
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %				
K1	5		-	-	5	4	16				
K2	5	10	-	-	15	12					
K3	-	-	30	30	60	50	50				
K4	-	-	20	20	40	34	34				
Marks	10	10	50	50	120	100	100				
NB: Hig of K lev	NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels										

Section	Section A (Multiple Choice Questions)							
Answei	r All Q	uestions	(10x1=10 marks)					
Q.No	CO	K Level	Questions					
1	CO1	K1						
2	CO1	K2						
3	CO2	K1						
4	CO2	K2						
5	CO3	K1						
6	CO3	K2						
7	CO4	K1						
8	CO4	K2						
9	CO5	K1						
10	CO5	K2						
Section	B (She	ort Answer	rs)					
Answei	r All Q	uestions	(5x2=10 marks)					
Q.No	CO	K Level	Questions					
11	CO1	K1						
12	CO2	K1						
13	CO3	K2						
14	CO4	K2						
15	CO5	K2						
Section	C (Eit	her/Or Ty	pe)					
Answei	r All Q	uestions	(5  x 5 = 25  marks)					
Q.No	CO	K Level	Questions					
16) a	CO1	K3						
16) b	CO1	K3						
17) a	CO2	K3						
17) b	CO2	K3						
18) a	CO3	K3						
18) b	CO3	K3						
19) a	CO4	K4						
19) b	CO4	K4						
20) a	CO5	K4						
20) b	CO5	K4						
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher					
level of	K leve	ls						
Section	D (Op	en Choice)						
Answei	r Any T	Three ques	tions (3x10=30 marks)					
Q.No		K Level	Questions					
21	COI	K3						
22	CO2	K3						
23	CO3	K3						
24	CO4	K4						
25	005	K4						

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name CLOUD COMPUTING	CLOUD COMPUTING								
Course Code 21UCAE54	L	Р	С						
Category Core Elective	5	-	5						
Nature of course: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPRENU	RSH	IP	✓						
Course Objectives:									
• Identify the technical foundations of cloud systems architectures.									
• Analyze the problems and solutions to cloud application problems.									
• Apply principles of best practice in cloud application design and management.									
• Identify and define technical challenges for cloud applications and assess the	• Identify and define technical challenges for cloud applications and assess their importance.								
• To offer skills, knowledge to understand technology for storing, analyzing and hand	ling la	rge							
amounts of data efficiently.	Ũ	C							
Unit: I Define cloud Computing		15							
Defining Cloud Computing - Cloud types -The NIST model, the cloud cube mode	l, De	ployr	nent						
models, Service models, Characteristics of cloud computing- Benefits of Cloud	l Coi	nput	ing-						
Disadvantages of cloud computing.									
Unit: II Understanding Cloud Architecture		20							
Cloud computing stack: compos ability - Infrastructure - platforms - Virtual	app	lianc	es -						
Communicationprotocols-Applications. Understanding Services and Applicatio	ns b	у Т	ype:						
Defining IaaS(Infrastructure as a Service) – Defining Platform as a Service(Paa	S) –	Defi	ning						
Software as a Service(SaaS) – Defining Identity as a Service(IDaas) – Defining Co	mpli	ance	as a						
Service(CaaS)									
Unit: III         Understanding Abstraction and Virtualization		10							
Using Virtualization Techniques – Loadbalancing and Virtualization – Understandir	ıg Hy	pervi	sors						
- Porting Applications-Exploring Platform as a Service: Defining services -	Usin	g PA	AAS						
application frameworks.									
Unit: IV Using Google Web services		15							
Exploring Google Applications - Surveying the Google Application Portfolio -	Expl	oring	the						
Google Toolkit - Working with the Google App Engine. Understanding Cloud Secu	rity:	Secu	iring						
the Cloud- Securing Data – Establishing Identity and Presence .									
Unit: V Moving Applications to the Cloud		15							
Applications in the Clouds - Applications and cloud APIs. Using Amazon V	Veb	servi	ces:						
Understanding Amazon Web Services - Amazon Web Service Components and Service	ces -	Wor	king						
with the Elastic Compute Cloud -(EC2) - Understanding Amazon Database Servi	ces -	Ama	nzon						
SimpleDB Amazon Relational Database Service (RDS)- Choosing a database for A	WS.								
Total Lecture Hours 75 Hrs									
Books for Study:									
Books for Study:		<u>75 H</u>	15						
Books for Study:         1. Barrie Sosinsky, "Cloud Computing Bible", Wiley, India 2014.		75 11							
<ul><li>Books for Study:</li><li>1. Barrie Sosinsky, "Cloud Computing Bible", Wiley, India 2014.</li><li>Unit 1: Chapter 1</li></ul>		75 11							
Books for Study:         1. Barrie Sosinsky, "Cloud Computing Bible", Wiley, India 2014.         Unit 1: Chapter 1         Unit 2: Chapter 3, 4		73 11							

Unit 4: Chapter 8,12						
Unit 5: Chapter 9,14						
Books for References:						
1. Rajkumar Buyya, James Broberg, Andrzej M. Goscin	ski, "Cloud Computing:Principles					
and Paradigms", Wile, 2011.						
2. Antony T Velte, "Cloud Computing: A Practical App	2. Antony T Velte, "Cloud Computing: A Practical Approach", McGraw Hill, 2009.					
Web Resources:						
1. https://www.citrix.com > en-in > glossary > what-is-cloud-computing						
2. https://data-flair.training > Blog Home > Cloud Computing Tutorials						
3. https://www.tutorialspoint.com > cloud_computing						
Course Outcomes	K Level					
At the end of the course, the students will be able to						
<b>CO1:</b> Illustrate Cloud Computing and its Model	K3					
CO2: Demonstrate Cloud Architecture and Services and	nd Applications by Type K3					
CO3: Construct Cloud Architecture and Exploring Pla	tform as a Service K3					
CO4: Analyze Google web services and understanding	cloud security K4					
<b>CO5:</b> Examine application to the cloud and understand	ling amazon web services. K4					

## CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	3	2
CO 2	2	2	3	2	2	2
CO 3	3	2	2	3	2	2
<b>CO 4</b>	2	3	2	2	2	2
CO 5	2	2	2	2	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	Defining Cloud Computing – Cloud types –The NIST model, the cloud cube model, Deployment models, Service models, Characteristics of cloud computing- Benefits of Cloud Computing-Disadvantages of cloud computing.	15	PPT / CHALK & TALK
п	Cloud computing stack: compos ability – Infrastructure – platforms - Virtual appliances – Communication protocols–Applications. Understanding Services and Applications by Type: Defining IaaS(Infrastructure as a Service) – Defining Platform as a Service (PaaS) – Defining Software as a Service (SaaS) – Defining Identity as a Service(IDaas) – Defining Compliance as a Service (CaaS).	20	PPT / CHALK & TALK
ш	Using Virtualization Techniques – Loadbalancing and Virtualization – Understanding Hypervisors – Porting Applications- <b>Exploring Platform</b> <b>as a Service</b> : Defining services - Using PAAS application frameworks.	10	PPT / CHALK & TALK
IV	Exploring Google Applications – Surveying the Google Application Portfolio – Exploring the Google Toolkit – Working with the Google App Engine. <b>Understanding Cloud Security:</b> Securing the Cloud- Securing Data – Establishing Identity and Presence .	15	PPT / CHALK & TALK
v	Applications in the Clouds – Applications and cloud APIs. Using Amazon Web services: Understanding Amazon Web Services - Amazon Web Service Components and Services - Working with the Elastic Compute Cloud -(EC2) - Understanding Amazon Database Services - Amazon SimpleDB Amazon Relational Database Service (RDS)- Choosing a database for AWS .	15	PPT / CHALK & TALK

# Course Designed by: Mrs.G.Mahalakshmi & V.Bhavani Assistant Professor

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print											
	Articulation Mapping – K Levels with Course Outcomes (COs)										
				Section	n A	Section	B	Section C	Section D		
Inte	Cos	K Level		MCQ	)s	Short Ans	swers	Fither or	Open		
rnal	COS	K Level	Q	No. of. uestions	K - Level	No. of. Questions	K - Level	Choice	Choice		
CI	CO1	K3		2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	K3		2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	К3		2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4		2	K1,K2	2	K2	2(K4,K4)	1(K4)		
		No. of Questions to be asked		4		3		4	2		
Question Pattern		No. of Questions to be answered		4		3		2	1		
CIA I	1& [	Marks for each question     1		1		2		5	10		
		Total Marks for each section	or	4		6		10	10		

	Distribution of Marks with K Level CIA I & CIA II											
	% of (Marks without choice)	Consolidate of %										
	K1	2	-	-		2	4	20				
	K2	2	6	-	-	8	16	20				
СІА	K3	-	-	20	20	40	80	80				
	K4	-	-	-	-	-	-	-				
-	Marks	4	6	20	20	50	100	100				
	K1	2	-	-		2	4	20				
	K2	2	6	-	-	8	16	20				
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)										
			MOQs		Short Answers		Section C	Section D			
S.No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	(Open Choice)			
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
No	of Quest. Aske	ions to be ed	10		5		10	5			
No.of Questions to be answered		10		5		5	3				
Marks for each question		1		2		5	10				
Total Marks for each section			10		10		25	30			
	(Figures	in parenthesi	s denotes, qu	estions s	hould be asl	ked with	the given K	level)			

	Distribution of Marks with K Level											
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %					
K1	5		-	-	5	4	16					
K2	5	10	-	-	15	12	10					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	34	34					
Marks	10	10	50	50	120	100	100					
NID TT	1 1 1 0	0	<b>•••</b>	• • •								

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

Section	Section A (Multiple Choice Questions)								
Answei	r All Q	uestions	(10x1=10 marks)						
Q.No	CO	K Level	Questions						
1	CO1	K1							
2	CO1	K2							
3	CO2	K1							
4	CO2	K2							
5	CO3	K1							
6	CO3	K2							
7	CO4	K1							
8	CO4	K2							
9	CO5	K1							
10	CO5	K2							
Section	B (She	ort Answer	rs)						
Answei	r All Q	uestions	(5x2=10 marks)						
Q.No	CO	K Level	Questions						
11	CO1	K2							
12	CO2	K2							
13	CO3	K2							
14	CO4	K2							
15	CO5	K2							
Section	C (Eit	her/Or Ty	pe)						
Answei	r All Q	uestions	(5 x 5 = 25 marks)						
Q.No	CO	K Level	Questions						
16) a	CO1	K3							
16) b	CO1	K3							
17) a	CO2	K3							
17) b	<u>CO2</u>	K3							
18) a	<u>CO3</u>	K3							
18) b	<u>CO3</u>	K3							
19) a	<u>CO4</u>	K4							
19) b	<u>CO4</u>	K4							
20) a	<u>CO5</u>	K4							
20) b	05								
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher						
level of	K leve	els or Chaine	<u></u>						
Answer	ע) ען ה אריי יי	en Unoice,	(2x10_20 montro)						
Answel O No		K L ovol	Ouestions (3X10=30 MarKs)						
21	$\frac{0}{0}$	K3	Questions						
21	$\frac{001}{002}$	K3							
22	$\frac{CO2}{CO3}$	K3							
23	$\frac{CO3}{CO4}$	K3 K4							
24	CO4 CO5	K/							
23	005	<b>K</b> 4							

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name MANAGEMENT INFORMATION SYSTEMS									
Course Code	21UCAE55					L	P	С	
Category	<b>Core Elective</b>					5	-	5	
Nature of cours	e: EMPLOYABILITY	<ul> <li>✓</li> </ul>	SKILL ORIENTED	✓	ENTREPRENU	J <b>RSH</b>	IP	<b>~</b>	
Course Objectives:									
Course Objecti•Describer record th•Introduct design a•Enable s expert symptoxiness•Enable t technolo threats a•Enable t technolo threats a•Provide questionUnit: IMaManagement In Information System as a Control Sy Organisation as model of Organ Score card, Scote approaches to DUnit: IIDec Decision-mak Modeling-Beha Decision-Makin Information col Processor.Unit: IIISystem Concept analysis of the Model - St Analysis(OOA) Ascertaining the and Implement of	the set of information the current issues with the e the fundamental princi- ind develop an understand tudents understand the ver- system structures as strated more competitive the students to use inform gy on electronic comme nd vulnerabilities of com- the theoretical models us s. <u>nagement Information S</u> formation System (M stem – Impact of the Ma stem- MIS: A support to a System – MIS: Orga <b>nization Excellence:Ess</b> ore card and Dash Board bevelopment Strategy - O <u>cision-Making and Inform</u> ing Concepts – Deci avioural Concepts Decis g. <b>Information, Kn</b> A Quality Product - O lection - Value of the in tems Engineering: Analy tsTypes of System – O existing system - System function of the MIS- Mana f MIS- MIS: Development	tech ose o iples ding variou egic v natio arce a npute sed i <u>yster</u> (IS): unage o the unisat senti d - S Class <u>matio</u> ion-N classi nform ysis a Gene em an Analy s of Deto	nology and decision su of the firm to solve bus of computer-based into of the principles and to us knowledge represent weapons to counter the on to assess the impact and electronic business er systems. In database management Concept-MIS: Defin ment Information System Management – Mana tion as a System – M ally of Strategic Plann Strategic Management and types of Strategy. On, Knowledge,Busine -Making Process- D Making – Organisatio edge,Business Intellig ification of the infor nation - General mode and Design eral model of MIS - N nalysis of a new requives strategic Management eral model of MIS - N nalysis of a new requives MIS: Development eration Quality cocess Model	upp ine forr tech ntat e th of t s an nt s nitic sten ager mate el co leccis onal <b>gen</b> mate el co lecci stren ager irer SSA of tren tech tech s an s an s an s an s an s an s an s an	ort systems in b ss problems. nation systems a iniques used. ion methods and reats to business the Internet and id understand th ystems to answe on-Role of the n-MIS and User ment Effectiven for a Digital Fin g - Tools of plan business Perfor Intelligence sion Analysis Decisional-Ma ice: Informatio tion - Methods of a Human as a f for system ana ments - System AD) - Obje f Long Plans Requirement – in the MIS-Ora	analys analys d diffe s and Interne e spece er bus Man - Man ess an rm.Cr nning mance by A king-1 n Co s od an Inf dlysis a Deve ect of t - Dev ganis	ss an sis an erent make net cific iness <u>15</u> nager nager nager nager nager ager ager ager ager nager nager ager ager ager ager ager ager ager	d d d d d d d d s e nent nent IS – <b>ng a</b> ance hree bree tical and tion stem nent for	

I Inite I	V Pugingge Intelligence for MIS	15						
Dint: I	y   Dusiness Intenigence for Who							
Dusine Why 2	s nuclingence and who – what is business intelligence (B1)?-1001s and 1echni B BI Developed How is BI Used? Process of Consistion of PI MIS on	d Business						
wily is	s BI Developed - How is BI Used?- Plocess of Generation of BI – Mis an	u Dusiliess						
Sustam	Systems (DSS): Concept and Philosophy DSS Models: Rehavioural Management Science and							
Operations Descarch Models, Group Desision Support System(GDSS), Artificial Intelligence(AI)								
Operat	Operations Research Models- Group Decision Support System(GDSS)- Artificial Intelligence(AI)							
System	- Knowledge based Expert System(KBES) – DSS Application in E-enterprise	e- MIS and						
Benefit	s of DSS							
Unit: V	Technology of Information System	15						
Introd	uction-Data Processing – Transaction Processing-Application Processing-Informat	tion System						
Process	sing OLAP for Analytical Information-TQM of Information System <b>Data</b> V	Varehouse:						
Archite	ecture to Implementation: Introduction-Data in Data Warehouse- Architectu	re of Data						
Wareho	buse-Data Warehouse Design-Organisation and Management of Data	Warehouse-						
Implen	nentation of Data Warehouse – Business Intelligence-Data Warehouse and MIS.	-						
	Total Lecture Hours	5 75 Hrs						
Books	for Study:							
1. War	nan S Jawadekar "Management Information System" A Global Digital Enterpri	se Systems						
McGR	aw Hill Education(India) Private Limited, Fifth Edition 2017	-						
Unit I:	Chapter 1 – 1.1 to 1.11							
	Chapter 3: 3.1-3.7							
Unit II:	: Chapter 6 : 6.1 to 6.6							
	Chapter 7: 7.1 to 7.6							
Unit II	I: Chapter 8 : 8.1 to 8.12							
	Chapter 9: 9.1- 9.7							
Unit IV	V: Chapter $11 - 11.1 - 11.6$ , $11.9$							
	Chapter $14 - 14.1 - 14.7$							
Unit V	: Chapter 16 - 16.1 – 16.7							
	Chapter 19 – 19.1-19.9							
Books	for References:							
1.Kenn	eth C. Laudon and Jane P. Laudon: Management Information System, Managing	the Digital						
Firm. F	Pearson Education. 14th Global edition. 2016. ISBN:9781292094007.	0						
2 Jame	es A. O' Brien, George M. Marakas: Management Information Systems, Globa	al McGraw						
Hill, 10	Oth Edition, 2011, ISBN: 978-0072823110.							
3. Stev	en Alter: Information Systems The Foundation of E-Business, Pearson Education.							
4thEdit	tion, 2002							
Web R	lesources:							
1.https	://onlinecourses.nptel.ac.in/noc20 mg60/preview							
2.https	://onlinecourses.swavam2.ac.in/cec21_ge05/preview							
3.https	://www.guru99.com/mis-tutorial.html							
Course	e Outcomes	K Level						
At the	end of the course, the students will be able to							
	Examining a Management Information system in a digital form and model of							
CO1:	organization	K3						
CO2·	Preparing Decision making and Information Concepts	К3						
CO3.	Implementing System Engineering and Development Process	K3						
CO4.	Structuring the Business Intelligence and Decision Support system	KA						
	Explaining the Dusiness intelligence and Decision Support system							
005:	Explaining Technology of Information System and Data Warehouse	К4						

### CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	3	2
CO 2	2	2	3	2	2	2
CO 3	3	2	2	3	2	2
CO 4	2	3	2	2	2	2
CO 5	2	2	2	2	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

# LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	Management Information System (MIS): Concept-MIS: Definition-Role of the Management Information System – Impact of the Management Information System-MIS and User- Management as a Control System- MIS: A support to the Management – Management Effectiveness and MIS – Organisation as a System – MIS: Organisation as a System – MIS for a Digital Firm. <b>Creating a model of Organization</b> <b>Excellence:Essentially</b> of Strategic Planning - Tools of planning - Balance Score card , Score card and Dash Board - Strategic Management of business Performance - Three approaches to Development Strategy - Class and types of Strategy.	15	PPT / CHALK & TALK
п	Decision- making Concepts – Decision-Making Process- Decision Analysis by Analytical Modeling- Behavioural Concepts Decision- Making – Organisational Decisional-Making - MIS and Decision- Making. <b>Information, Knowledge,Business Intelligence:</b> Information Concepts - Information : A Quality Product - Classification of the information - Methods od data and information collection - Value of the information - General model of a Human as an Information Processor.	15	PPT / CHALK & TALK
III	System ConceptsTypes of System – General model of MIS - Need for system analysis - System analysis of the existing system - System analysis of a new requirements - System Development Model - Structured System Analysis and Design(SSAD) - Object Oriented Analysis(OOA). <b>Development Process of MIS</b> : Development of Long Plans of the MIS-Ascertaining the Class of Information- Determining the Information Requirement – Development and Implementation of the MIS- Management Information Quality in the MIS-Oraganisation for Development of MIS: Development Process Model.	15	PPT / CHALK & TALK
IV	Business Intelligence and MIS – What is Business Intelligence (BI)?- Tools and Techniques of BI-Why is BI Developed - How is BI Used?-		PPT / CHALK & TALK

	Process of Generation of BI –MIS and Business Intelligence. <b>Decision</b> <b>Support Systems and Knowledge Management</b> : Decision Support Systems(DSS):Concept and Philosophy- DSS Models: Behavioural, Management Science and Operations Research Models- Group Decision Support System(GDSS)- Artificial Intelligence(AI) System- Knowledge based Expert System(KBES) – DSS Application in E- enterprise- MIS and Benefits of DSS.	15	
V	Introduction-Data Processing –Transaction Processing-Application Processing-Information System Processing OLAP for Analytical Information-TQM of Information System . <b>Data Warehouse</b> : Architecture to Implementation: Introduction-Data in Data Warehouse- Architecture of Data Warehouse-Data Warehouse Design-Organisation and Management of Data Warehouse-Implementation of Data Warehouse – Business Intelligence-Data Warehouse and MIS.	15	PPT / CHALK & TALK

Course Designed by: Mrs.G.Mahalakshmi & V.Bhavani

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print									
Articulation Mapping – K Levels with Course Outcomes (COs)										
			Section	Section A		B	Section C	Section D		
Inte rnal	Cos	K Level	MCC	<u>Qs</u>	Short Ans	swers	Fither or	Onen		
	005	IN LOVON	No. of. Questions	K - Level	No. of. Questions	K - Level	Choice	Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
		No. of Questions to be asked	4		3		4	2		
Question Pattern		No. of Questions to be answered	4		3		2	1		
	I & I	Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

	Distribution of Marks with K Level CIA I & CIA II											
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %				
	K1	2	-	-		2	4	20				
	K2	2	6	-	-	8	16					
СІА	K3	-	-	20	20	40	80	80				
I	K4	-	-	-	-	-	-	-				
-	Marks	4	6	20	20	50	100	100				
	K1	2	-	-		2	4	20				
	K2	2	6	-	-	8	16	20				
CIA	<b>K</b> 3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	Marks	4	6	20	20	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	MOQs       No. of     K –       Questions     Level		Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)		
1	CO1	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
No.	of Quest. Aske	ions to be ed	10		5		10	5		
No.of Questions to be answered		10		5		5	3			
Marks for each question			1		2		5	10		
Total Marks for each section			10		10		25	30		
	(Figures	in parenthesi	s denotes, qu	estions s	hould be asl	ked with	the given K	level)		

	Distribution of Marks with K Level											
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %					
K1	5		-	-	5	4	16					
K2	5	10	-	-	15	12	10					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	34	34					
Marks	10	10	50	50	120	100	100					
ND. III	than loval of n	arformance	f the student	is to be acc	and by	ttomating	highon loval					

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

Section	A (Mu	ıltiple Cho	ice Questions)
Answei	r All Q	uestions	(10x1=10 marks)
Q.No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answer	rs)
Answei	r All Q	uestions	(5x2=10 marks)
Q.No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r All Q	uestions	(5  x 5 = 25  marks)
Q.No	CO	K Level	Questions
16) a	CO1	K3	
16) b	CO1	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	CO5	K4	
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher
level of	K leve	ls	
Section	D (Op	en Choice)	
Answei	r Any T	Three ques	tions (3x10=30 marks)
Q.No		K Level	Questions
21	COI	K3	
22	CO2	K3	
23	CO3	K3	
24	CO4	K4	
25	CO5	K4	

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	ARTIFICIA	L INTEL	LI	GENCE					
Course Code	21UCAE56							Р	С
Category	Core						5	-	5
Nature of cours	e: EMPLOYA	BILITY	✓	SKILL ORIENTED	✓	ENTREPRENU	J <b>RSH</b>	IP	~
Course Objecti	ves :								
<ul> <li>Describe</li> <li>Analyze</li> <li>Demons agents.</li> <li>Learn th</li> </ul>	<ul> <li>Describe the concept of Artificial Intelligence</li> <li>Analyze the search techniques and knowledge representation</li> <li>Demonstrate knowledge of the building models of AI as presented in terms of intelligent agents.</li> <li>Learn the purpose of heuristic search techniques.</li> </ul>								
• Examine	the issues inv	volved in k	nov	wledge bases, reasoning	g sy	stems and plan	ning	1 = 1	
The AI problem Model – Criteria State Space S	is - The under for Success, learch – Pr	erlying As <b>Problems</b> oduction	sum , <b>Pr</b> Sys	ptions – What is an A <b>roblems Spaces and S</b> stems, Problem Char b Drograms	AI te earc ract	echnique? - The ch : Defining the eristics, Produ	ie Lev le Pro letion	vel of blem Sys	f the as a stem
Characteristics,	Characteristics, Issue in the Design of Search Programs.								
Unit: II Her	Unit: IIHeuristic Search Techniques:15hrs								
Heuristic Sear	ch Technique	es: Genera	te a	and Test, Hill Climbir	ng, i	Best – First Se	earch,	Prot	olem
Linit: III Kn	straint Satisfac	ction, and I		ans – Ends Analysis.				151	<b>1 M</b> G
Knowledge Re	presentation		1 15 ?ent	sues. resentation and Manni	nos	– Approaches	to K	nowle	ns adoe
Representation, Logic : Repres Computable Fun	Issues in Kn enting Simple actions and Pr	nowledge 1 e Facts in redicates –	Rep Log Res	resentation – The Fra gic - Representation solution – Natural Dedu	ings ime Inst ictio	Problem – Us tance and ISA	ing I Relat	<b>Predi</b> tionsl	cate nips,
Unit: IV Rep	presenting kn	owledge u	sin	g Rules:				151	ırs
<b>Representing</b> Programming, a	<b>knowledge</b> und Forward V	using Ru	l <b>es:</b> cwa	Procedural Versus rd Reasoning – Matchi	De ing-	clarative Know	vledg ledge.	e, L	ogic
Unit: V Syr	nbolic Reason	ning Unde	r U	ncertainty:				151	ırs
Symbolic Reas Nonmonotonic of DFS – Bread	oning Under Reasoning – I h – First Sear	Uncertain Implementation	n <b>ty:</b> atio	: Introduction to Nonn n Issues – Augmenting	non g Pr	otonic Reasonii oblem Solver I	ng – mpler	Logic nenta	tion
					To	tal Lecture Ho	urs	75 I	Irs
<b>Books for Stud</b>	y:								
1.Stuart J.Russell ,Peter Norvig "Artificial Intelligence A modern approach" Third edition, Pearson Education India Unit I: Chapter 1: 1.1 - 1.4, 2: 2.1,2.3,2.4 Unit II: Chapter 3: 3.1, 3.3-3.5, 5: 5.1,5.2,5.3 Unit III: Chapter 7: 7.1-7.4,7.7, 18:18.1 -18.2 Unit IV: Chapter 21:21 1 21 2 22:22 1 22 4									
Unit IV: Chapte	Unit IV: Chapter 21:21.1-21.3 ,22:22.1-22.4								

Unit V: Chapter 25:25.1-25.8

Books	for References:	
1. Chr	istopher M. Bishop. Pattern Recognition and Machine Learning (Springer)	
2. Intro	oduction to Artificial Intelligence and Expert Systems by Dan W. Patterson, Prenti	ce Hall of
India		
Web F	Resources:	
https:	//www.tutorialspoint.com/dwh/index.htm	
https:/	//www.guru99.com/data-warehousing-tutorial.html	
https:/	//www.javatpoint.com/data-mining-techniques	
Cours	e Outcomes	K Level
Course At the	e Outcomes end of the course, the students will be able to	K Level
Course At the CO1:	e Outcomes end of the course, the students will be able to Determining Artificial Intelligence (AI) fundamentals and Agents.	K Level K3
Course At the CO1:	e Outcomes end of the course, the students will be able to Determining Artificial Intelligence (AI) fundamentals and Agents. Examining the basic principles of AI solutions that require in problem solving,	K Level K3
Course At the CO1: CO2:	e Outcomes end of the course, the students will be able to Determining Artificial Intelligence (AI) fundamentals and Agents. Examining the basic principles of AI solutions that require in problem solving, inference perception, knowledge representation, and learning	K Level K3 K3
Course At the CO1: CO2: CO3:	e Outcomes end of the course, the students will be able to Determining Artificial Intelligence (AI) fundamentals and Agents. Examining the basic principles of AI solutions that require in problem solving, inference perception, knowledge representation, and learning Implementing different searching algorithms for AI programming techniques	K Level K3 K3 K3
Course At the CO1: CO2: CO3: CO3:	e Outcomes end of the course, the students will be able to Determining Artificial Intelligence (AI) fundamentals and Agents. Examining the basic principles of AI solutions that require in problem solving, inference perception, knowledge representation, and learning Implementing different searching algorithms for AI programming techniques Structuring basic ANN and different optimizations techniques	K Level K3 K3 K3 K3 K4

### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	3	2
CO 2	2	2	3	2	2	2
CO 3	3	2	2	3	2	2
<b>CO 4</b>	2	3	2	2	2	2
CO 5	2	2	2	2	3	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	The AI problems - The underlying Assumptions – What is an AI technique? - The Level of the Model – Criteria for Success, <b>Problems, Problems Spaces and Search :</b> Defining the Problem as a State Space Search – Production Systems, Problem Characteristics, Production System Characteristics, Issue in the Design of Search Programs.	15	PPT,Chalk & Talk
II	<b>Heuristic Search Techniques:</b> Generate and Test, Hill Climbing, Best – First Search, Problem Reduction, Constraint Satisfaction, and Means – Ends Analysis.	15	PPT,Chalk & Talk
ш	Knowledge Representation Issues : Representation and Mappings – Approaches to Knowledge Representation, Issues in Knowledge Representation – The Frame Problem – Using Predicate Logic : Representing Simple Facts in Logic - Representation Instance and ISA Relationships, Computable Functions and Predicates – Resolution – Natural Deduction	15	ICT Tools
IV	<b>Representing knowledge using Rules:</b> Procedural Versus Declarative Knowledge, Logic Programming, and Forward Versus Backward Reasoning – Matching- Control Knowledge.	15	PPT,Chalk & Talk
V	Symbolic Reasoning Under Uncertainty: Introduction to Nonmonotonic Reasoning – Logic for Nonmonotonic Reasoning – Implementation Issues – Augmenting Problem Solver Implementation of DFS – Breadth – First Search	15	ICT

# Course Designed by: MrsV. Bhavani

	Learning Outcome Based Education & Assessment (LOBE)							
	Formative Examination - Blue Print							
		Articulation	Mapping – F	X Levels w	vith Course C	Outcome	s (COs)	1
			Section	n A	Section	B	Section C	Section D
Inte	Cos	K I evel	MCO	Qs	Short Ans	swers	Fither or	Onen
rnal	CUS	K Level	No. of.	К-	No. of.	К-	Choice	Choice
			Questions	Level	Questions	Level		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)
		No. of						
		Questions to be	4		3		4	2
		asked						
		No. of						
Que	stion	Questions to be	4		3		2	1
Pattern		answered						
CIA	I & II	Marks for each	1		2		5	10
		question	I		4		5	10
		Total Marks						
		for each	4		6		10	10
		section						

		Dist	ribution of <b>I</b>	Marks with	K Level C	IA I & (	CIA II	
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
СТА	K3	-	-	20	20	40	80	80
I	K4	-	-	-	-	-	-	-
-	Marks	4	6	20	20	50	100	100
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
CIA	K3	-	-	10	10	20	40	40
II	<b>K4</b>	-	_	10	10	20	40	40
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course									
S.No	COs	K - Level	MOC No. of Questions	2s K – Level	Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)		
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
2	CO2	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)		
No	of Quest. Aske	ions to be ed	10		5		10	5		
No	No.of Questions to be answered10553									
Marks for each question 1							5	10		
Total I	Total Marks for each section10102530									
	(Figures	in parenthesi	s denotes, qu	estions s	hould be as	ked with	the given K	level)		

	Distribution of Marks with K Level							
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5		-	-	5	4	16	
K2	5	10	-	-	15	12	10	
K3	-	-	30	30	60	50	50	
K4	-	-	20	20	40	34	34	
Marks	10	10	50	50	120	100	100	
ND. III	rhan laval of n	arfarmanaa	f the student	is to be acc	and by	attomating	highon loval	

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

Section	A (Mu	ıltiple Cho	ice Questions)
Answei	r All Q	uestions	(10x1=10 marks)
Q.No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answer	rs)
Answei	r All Q	uestions	(5x2=10 marks)
Q.No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r All Q	uestions	(5  x 5 = 25  marks)
Q.No	CO	K Level	Questions
16) a	CO1	K3	
16) b	CO1	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	CO5	K4	
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher
level of	K leve	ls	
Section	D (Op	en Choice)	
Answei	r Any T	Three ques	tions (3x10=30 marks)
Q.No		K Level	Questions
21	COI	K3	
22	CO2	K3	
23	CO3	K3	
24	CO4	K4	
25	CO5	K4	

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course	e Name	DATA MINING LAB			
Course	e Code	21UCASP5	L	Р	С
CategorySkill2					2
Nature	of cours	e: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPRE	NURS	SHIP	~
Course	e Objecti	ives:			
•	Install da	ata mining tools and get hands on experience in that tool.			
•	Apply an Examin	e the use of PHP programming that uses SOL tables.			
•	Examin	e to extract huge sets of data using OLAP operations.			
• S No	Able to a	analyze and classify web documents using Web mining techniques.		TT.	
<b>5.</b> N0		List of Programs			<u>'S</u>
1	Listing a	applications for mining			
2	Convers	sion of various data files			
3	Training	the given dataset for an application			
0	Training	, the given dutaset for an appreation			
4	Tasting	the given detect for an application			
4	resting	the given dataset for an application		201	-
-	D.			301	ITS
5	Data pre	e-processing – data filters			
6	Feature	selecting			
7	Text min	ning			
8	Web mi	ning			
		Total Lastuma U	01185	30 1	rc
Relate	d Online	Contents (MOOC, SWAYAM, NPTEL, Websites etc.)	Jul 8	<u>з</u> о п	19
1.	https://v	www.w3schools.com/DataMining tools/			
2.	https://v	www.tutorialsteacher.com/DataMining			
3.	https://v	www.mygreatlearning.com/DataMining-tutorial			

Course	Course Outcomes			
<b>CO1:</b>	Determining data mining tools	K3		
<b>CO2:</b>	Sketching Decision Tree for real time data	K3		
CO3:	Examining Apriori Algorithm for larger datasets	K3		
<b>CO4:</b>	Implementing OLAP operations	K4		
CO5:	Structuring a small data mining project with real time dataset	K4		

### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	PO 6
CO 1	2	3	2	2	3	3
CO 2	2	2	3	2	3	2
CO 3	2	2	2	1	2	2
CO 4	2	2	2	2	2	2
CO 5	3	2	2	2	2	2

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

Unit	Course Name		Pedagogy
1	Listing applications for mining		
2	Conversion of various data files		
3	Training the given dataset for an application		
4	Testing the given dataset for an application		Laboratory
5	Data pre-processing – data filters		experiments
6	Feature selecting		
7	Text mining		
8	Web mining		

### LESSON PLAN

Course Designed by: Mrs.V.Bhavani, Assistant Professor




### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	C# and .NET PROGRAMMING						
Course Code	21UCAC61		L	Р	С		
Category	CORE		6	-	4		
Nature of cours	e: EMPLOYABILITY 🖌 SKILL ORIENTED	✓ ENTREPRENU	J <b>RSH</b>	IP	✓		
Course Objecti	ves:						
<ul> <li>To Highligh Gathering kn</li> <li>To design an</li> <li>Demonstrate development</li> <li>Represent the</li> <li>To practice to experiences.</li> </ul>	<ul> <li>To Highlighting Knowledge of Object- oriented paradigm in the C# Program Language and to Gathering knowledge of .NET environments.</li> <li>To design and develop console and window-based .NET Application.</li> <li>Demonstrate the usage of recent platforms like C#, XML, and ASP.Net which is used in the development of web application</li> <li>Represent the security in the .NET framework.</li> <li>To practice the fundamental programming mythologies in the C# programming via laboratory experiences</li> </ul>						
Init. I Int.	aducing C# Literale Variables and Data turnes			10	hna		
Evolution of C#	Characteristics Applications C# Differ from	C++ Iava - II	ndore	51   brete	ling		
Runtime – Fram Languages, Ben Comments, Mai Interface Input Program Coding Variables, Data Default Values, Unit: II Ope	ework Base Classes – User and Programme Interfa efits. <b>Overview of C#</b> - Introduction, Simple C# n Returning a value, Command Line Arguments, – Using Mathematical functions – Compile Time Style. <b>Literals, Variables and Data typ</b> Types, Value Types, Reference Types, Declaration <u>Constant Variables, Scope of variables, Boxing and</u> erations and Expressions, Decision Making and I pring	ces – Visual Studi Program, Names Main with a Clas E Errors – Progra es – Introduction n and initialization Unboxing. Branching and	o .NE paces, ss – P m Str 1 – L n of v	T, .N Add rovic uctur iteral ariab	NET ling ling re – ls – bles, Bhrs		
Introduction _	Arithmetic Operations – Relational Operators – I	ogical Operators	- Ass	ionn	hent		
<b>Introduction</b> –Arithmetic Operations – Relational Operators – Logical Operators – Assignment Operators, Increment and Decrement operators, Conditional Operators, Bitwise operators, Special Operators, Arithmetic Expressions, Evaluation and Expressions, Type Conversions Mathematical Functions. <b>Decision Making and Branching – Introduction</b> – Decision Making with if Statement – Simple if Statement - ifelse statement, Nesting of ifelse statement, elseif ladder, Switch statement,?: operators- <b>Decision Making and Looping – Introduction</b> – while statement – do statement – for each statement – jump in loops							
Unit: III Me	thods in C# , Handling Arrays and Manipulating	g Strings		18	Bhrs		
Unit: IIIMethods in C#, Handling Arrays and Manipulating Strings18hrsIntroduction- Declaring methods – Main Methods – Invoking and Nesting of methods – Methodparameters – pass by value and reference – output parameters – variable argument lists – methodoverloading, Handling Arrays – Introduction – One Dimensional Arrays – Creating an Array –Two Dimensional Arrays – Variable Size Arrays – System Array Class – Array List Class,Manipulating Strings - Creating Strings, String Methods, Inserting Strings, Comparing Strings,Finding Substrings, Mutable Strings, Array of Strings, Regular ExpressionsUnit: IVClasses and ObjectsInheritance and Polymorphism							
Introduction- Ba	asic Principles of OOPs – Defining a Class. addin	ng variables, Metl	nods.	Men	ıber		
Introduction D	the second						

Access Modifiers, Creating Objects, Accessing Class Members, Constructors, overloaded constructors, Static Members and Constructors, Private Constructors, Copy Constructors, Destructors, member initialization, This reference- Nesting of Classes, Constant members, Read-only members, properties, Indexes. **Inheritance and Polymorphism** - classical, containment, Defining a subclass, visibility control, defining subclass constructors, Multilevel Inheritance, Hierarchical Inheritance, Overriding methods, Hiding methods, Abstract Classes& Methods, Sealed Classes and Preventing inheritance, sealed methods, polymorphism, Extensive Methods

#### Unit: V Interfaces, Operator Overloading, Delegates and Events

18

Defining an Interface – Extending an Interface – Implementing Interfaces, interfaces and inheritance, Explicit interface implementations, Abstract Class and interfaces, **Operator Overloading** - Operators, Need for operator overloading, Defining Operator overloading, overloading unary operators, overloading binary operators, overloading Comparing operators, **Delegates and Events** – Delegates – Declaration and methods – Delegate Instantiation- Delegate invocation – using Delegates – multicast Delegates – Events, **Managing Console IO operations** – Console Class, Console input, Console output, formatted output, Numeric formatting, Standard Numeric Format, Custom Numeric Format.

Total Lecture Hours90 Hrs

#### **Books for Study:**

1. Balagurusamy .E ,Programming in C # , Tata McGraw Hill, New Delhi, Fourth Edition, 2004. UNIT I: Chapters 1.1 – 1.7, 2.1 – 2.9, 3.1 – 3.15, 4.1 – 4.12 UNIT II: Chapters 5.1 – 5.15,6.1 - 6.8, 7.1 – 7.6 UNIT III: Chapters 8.1 – 8.11,9.1 – 9.7, 10.1 – 10.9 UNIT IV: Chapters 12.1 – 12.22, 13.1 – 13.16 UNIT V: Chapters 14.1 – 14.7, 15.1 – 15.7, 16.1 – 16.9-17.1 – 17.8 **Books for References:** 1. Rober Powell, Richard Weeks, C# and .NET Framework, Tech Media Publication, NewDelhi.2008. 2. Jon Skeet, C# in depth, Manning Version, Fourth Edition, 2019 3. YashavantKanetkar, Let Us C, BPB Publications, New Delhi, Tenth Edition, 2010. 4. Byron Gottfried, Programming with C, McGraw Hill Education (India) Private Limited, New Delhi, Third Edition, 2014. Web Resources: 1. https://www.tutorialspoint.com/csharp/index.htm 2. https://www.javatpoint.com/c-sharp-tutorial 3. https://www.udemy.com/course/c-net-for-beginners/ **Course Outcomes** K Level At the end of the course, the students will be able to Examining the programming framework in C# CO1: **K3 CO2:** Experimenting the programming language concepts **K3 CO3:** Implementing OOPS concepts in all relevant areas & development **K3** Illustrating Inheritance and polymorphism CO4: **K4** 

**CO5:** Develop a new project in team and as a individual member.

**K4** 

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	2	2
CO 2	3	3	2	2	2	2
CO 3	2	2	3	3	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	3	2	2	1	3	3

### CO & PO Mapping:

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### **LESSON PLAN**

Unit	Course Name	Hrs	Pedagogy
	-Evolution of C# - Characteristics - Applications - C# Differ from C++,		
	Java Understanding .NET: The C# EnvironmentNET Strategy,		
	Origin, .NET Framework - Common Language Runtime - Framework		
	Base Classes - User and Programme Interfaces - Visual Studio .NET,		
	.NET Languages, Benefits. Overview of C# - Introduction, Simple C#		
т	Program, Namespaces, Adding Comments, Main Returning a value,	10	Chalk &
1	Command Line Arguments, Main with a Class – Providing Interface Input	18	Talk
	- Using Mathematical functions - Compile Time Errors - Program		
	Structure – Program Coding Style. Literals, Variables and Data		
	types - Introduction - Literals - Variables, Data Types, Value Types,		
	Reference Types, Declaration and initialization of variables, Default		
	Values, Constant Variables, Scope of variables, Boxing and Unboxing		
	Arithmetic Operations - Relational Operators - Logical Operators -		
	Assignment Operators, Increment and Decrement operators, Conditional		
	Operators, Bitwise operators, Special Operators, Arithmetic Expressions,		
	Evaluation and Expressions, Type Conversions Mathematical Functions.		
II	Decision Making and Branching - Introduction - Decision Making with	18	ICT
	if Statement - Simple if Statement - ifelse statement, Nesting of ifelse		
	statement, elseif ladder, Switch statement,?: operators- Decision		
	Making and Looping - Introduction - while statement - do statement-		
	for statement – for each statement – jump in loops.		
	Introduction- Declaring methods - Main Methods - Invoking and Nesting		
	of methods - Method parameters - pass by value and reference - output		
	parameters - variable argument lists - method overloading, Handling		
	Arrays – Introduction – One Dimensional Arrays – Creating an Array –	10	ют
111	Two Dimensional Arrays - Variable Size Arrays - System Array Class -	18	ICI
	Array List Class, Manipulating Strings - Creating Strings, String		
	Methods, Inserting Strings, Comparing Strings, Finding Substrings,		
	Mutable Strings, Array of Strings, Regular Expressions		

IV	Basic Principles of OOPs – Defining a Class, adding variables, Methods, Member Access Modifiers, Creating Objects, Accessing Class Members, Constructors, overloaded constructors, Static Members and Constructors, Private Constructors, Copy Constructors, Destructors, member initialization, This reference- Nesting of Classes, Constant members, Read- only members, properties, Indexes. <b>Inheritance and Polymorphism</b> - classical, containment, Defining a subclass, visibility control, defining subclass constructors, Multilevel Inheritance, Hierarchical Inheritance, Overriding methods, Hiding methods, Abstract Classes& Methods, Sealed Classes and Preventing inheritance, sealed methods, polymorphism, Extensive Methods.	18	Chalk & Talk
V	Defining an Interface – Extending an Interface – Implementing Interfaces, interfaces and inheritance, Explicit interface implementations, Abstract Class and interfaces, <b>Operator Overloading</b> - Operators, Need for operator overloading, Defining Operator overloading, overloading unary operators, overloading binary operators, overloading Comparing operators, <b>Delegates and Events</b> – Delegates – Declaration and methods – Delegate Instantiation- Delegate invocation – using Delegates – multicast Delegates – Events, <b>Managing Console IO operations</b> – Console Class, Console input, Console output, formatted output, Numeric formatting, Standard Numeric Format, Custom Numeric Format .	18	Chalk & Talk

Course Designed by: Mrs.V.Bhavani, Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
Inte rnal Cos		K Level	Section A       MCQs       No. of.     K -       Ouestions     Level		Section B Short Answers No. of. K - Ouestions Level		Section C Either or Choice	Section D Open Choice
CI	CO1	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AI	CO2	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)
CI	CO3	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)
		No. of Questions to be asked	4		3		4	2
Questio Patterr CIA I &	stion tern	No. of Questions to be answered	4		3		2	1
	1 & 11	Marks for each question	1		2		5	10
		Total Marks for each section	4		6		10	10

	Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
СТА	K3	-	-	20	20	40	80	80
	K4	-	-	-	-	-	-	-
•	Marks	4	6	20	20	50	100	100
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
CIA	K3	-	-	10	10	20	40	40
II	K4	-	-	10	10	20	40	40
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)							
			MOQ	2s	Short An	swers	Section C	Section D
S.No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Entiter / or	(Open Choice)
			Questions	Level	Question	Level	Choice)	Choice)
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
No	of Quest	ions to be	10		5		10	5
	Aske	ed	10		5		10	2
No	.of Quest	ions to be	10		5		5	3
answered			10		2		3	5
Marks for each question		1		2		5	10	
Total I	Marks for	each section	10		10		25	30
	(Figures	in parenthesi	s denotes, qu	estions s	hould be as	ked with	the given K	level)

	Distribution of Marks with K Level							
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5		-	-	5	4	16	
K2	5	10	-	-	15	12	10	
K3	-	-	30	30	60	50	50	
K4	-	-	20	20	40	34	34	
Marks	10	10	50	50	120	100	100	
NB: Hig	NB: Higher level of performance of the students is to be assessed by attempting higher level							
of K lev	els.							

Section	A (Mu	iltiple Cho	ice Questions)
Answei	r All Q	uestions	(10x1=10 marks)
Q.No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (She	ort Answer	rs)
Answei	r All Q	uestions	(5x2=10 marks)
Q.No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r All Q	uestions	(5  x 5 = 25  marks)
Q.No	CO	K Level	Questions
16) a	CO1	K3	
16) b	CO1	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	CO5	K4	
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher
level of	K leve	ls	
Section	D (Op	en Choice)	
Answei	$\frac{r \text{ Any } 1}{CO}$	nree ques	uons (3x10=30 marks)
<b>Q.N0</b>	$\frac{0}{0}$	K Level	Questions
21		K3	
22	$\frac{CO2}{CO2}$	K3 172	
25	<u>CO3</u>	K.S IZA	
24	<u>CO</u> 5	K4 17.4	
23	005	К4	

## **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Cour	se Name	e Name C# and .NET PROGRAMMING LAB					
Cour	se Code	21UCACP6	L	Р	С		
Categ	gory	CORE LAB	-	6	4		
Natur	e of cours	e: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPREN	URS	HIP	✓		
Cour	se Objecti	ves:					
• M	aking stud	lent understand the concept of framework.					
• T	o develop	logics this will help them to create programs, applications in Net Fran	newo	rk.			
• T	o create a	simple application through framework and its native Language.					
• T	o understa	nd the Programming concepts in .Net Framework and create website u	ising	.Net			
C	ontrols.						
• D	esign and	develop dynamic, database using .Net.					
S.No		List of Programs		Hr	`S		
1	C# Prog	ram to Display Numbers in the form of Triangle					
2	C# Prog	ram to Get a Number and Display the Sum of the Digits					
3	C# Prog	ram to Search an Element in an Array					
4	C# Prog	ram to Demonstrate Boxing and Unboxing Operations					
5	C# Prog	ram to Combine Two Delegates					
6	C# Prog	ram to Demonstrate Multilevel Inheritance					
7	C# Prog	ram to Illustrate Hierarchical Inheritance					
8	C# Prog	ram to Demonstrate Multiple Exceptions					
9	C# prog	ram to convert a temperature from Celsius to Fahrenheit		9(	)		
10	C# prog	ram to design a simple calculator.			-		
11	C# Prog	ram to Generate the Mark sheet of the Student					
12	Create a	windows form with the following controls Textbox, Radio button,					
10	Check b	ox, Command Button					
13	Create a	program to perform validation using validation controls.					
14	Write a .NET	program to store the employee details using class and methods in C#					
15	Create a	program to connect with database and manipulate the records in the					
	database	e using ADO .NET					
		Total Lecture Ho	urs	90 H	<b>rs</b>		
Web	Resourse:						
1.	nttps://wv	vw.tutorialspoint.com/csharp/index.htm					
2.	nttps://wv	vw.javatpoint.com/c-sharp-tutorial					
3.	nttps://wv	vw.udemv.com/course/c-net-for-beginners/					
Cour	se Outcon	nes		K Le	evel		
CO1:	Underst	and code solutions and compile C# projects within the .NET framework	ork.	K	3		
<b>CO2</b> :	Design	and develop professional console and window based .NET application	ı.	K	3		
CO3:	Implem applicat	ent string manipulation, events and exception handling within .NET ion environment.		K	3		
CO4:	Design applicat	and Implement database connectivity using ADO.NET in window bas ion.	ed	K	4		

**CO5:** Develop professional console and window based .NET application.

K4

### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	PO 6
CO 1	2	3	2	2	3	3
CO 2	2	2	3	2	3	2
CO 3	2	2	2	1	2	2
<b>CO 4</b>	2	2	2	2	2	2
CO 5	3	2	2	2	2	2

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### **LESSON PLAN**

Unit	Course Name	Hrs	Pedagogy
Unit 1 2 3 4 5 6 7 8 9	Course Name C# Program to Display Numbers in the form of Triangle C# Program to Get a Number and Display the Sum of the Digits C# Program to Search an Element in an Array C# Program to Demonstrate Boxing and Un boxing Operations C# Program to Combine Two Delegates C# Program to Demonstrate Multilevel Inheritance C# Program to Illustrate Hierarchical Inheritance C# Program to Demonstrate Multiple Exceptions C# program to convert a temperature from Celsius to Fahrenheit	Hrs	Pedagogy
9 10 11 12 13	C# program to convert a temperature from Celsius to Fahrenheit C# program to design a simple calculator. C# Program to Generate the Mark sheet of the Student Create a windows form with the following controls Textbox, Radio button, Check box, Command Button Create a program to perform validation using validation controls.	90	Laboratory experiments
14	Write a program to store the employee details using class and methods in C# .NET		
15	Create a program to connect with database and manipulate the records in the database using ADO .NET		

### Course Designed by Mrs V.Bhavani & Mrs R.Vasuki Assistant Professor



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Nat	me PROJEC	Γ AND VIVA - VOCE							
Course Co	de 21UCAPH	R1			L	Р	С		
Core	PRACTIC	CAL			-	6	4		
NATURE	OF COURSE:	EMPLOYABILITY	SKILL ORIENTED	ENTRE	PREN	URSI	HIP		
COURSE	<b>OBJECTIVES</b> :								
• To acqu	ire the knowled	lge about selecting the ta	sk based on their cours	e skills.					
<ul> <li>To get the knowledge about analytical skill for solving the selected task</li> <li>To get confidence by implementing the task in a real time projects</li> </ul>									
$\bullet$ To get $\bullet$	<ul> <li>To get confidence by implementing the task in a real time projects.</li> <li>To Excilitate emprised in the project in the second sec</li></ul>								
$\bullet  10 \text{ Fac.}$	Paul time project	tial learning.							
• 10 d0 l	Cear time projec	18.							
	> Synon	cic							
	<ul> <li>Synop</li> <li>Introduction</li> </ul>	uction							
	<ul> <li>Modul</li> </ul>	e description							
	<ul> <li>Existing and proposed system</li> </ul>								
	<ul> <li>Data Flow Diagram</li> </ul>								
	<ul> <li>System Flow Diagram</li> <li>90</li> </ul>								
	<ul> <li>Entity Relationship Diagram</li> </ul>								
	> Form	Design							
	Databa	ase Design							
	Testin	g							
	Implei	nentation							
	> Form	Design							
			Total	Lecture	Hour	s 90	0 Hrs		
Related O	nline Content	s (MOOC, SWAYAM	I, NPTEL, Websites	etc.)					
1. <u>htt</u>	<mark>)://www.googl</mark>	<u>e.com</u>							
2. <u>htt</u>	o://www.w3scl	<u>nools.com</u>							
3. <u>httr</u>	o://codeguru.c	<u>om</u>							
Web Refe	rence								
1. <u>https://v</u>	www.upgrad.com	n/blog/web-development-	project-ideas-for-beginn	ers/					
2. <u>https://v</u>	www.geeksforge	eks.org/web-development	<u>-project-ideas/</u>						
3. <u>https://r</u>	addevon.com/ar	ticles/10-great-web-devel	opment-learning-projec	<u>t-ideas/</u>					
4. <u>https://v</u>	www.edx.org/cou	<u>irse/project-management</u>	<u>-for-development</u>			-			
5. https://	spoken-tutorial. D COURSE O	org/tutorial-search/?searc	cn_toss=Python+3.4.3&s	search_lai	iguag		glish ovel		
CO1. E	amine program	UICUIVIE ming skill for solving the	nroject						
$\begin{array}{c c} CO1; & EX \\ \hline CO2; & C_{1} \end{array}$	annie program oun the task and	to collect the necessary	information and software	are		r L	3		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	velon and Test	ng the task based on the	software	ui C		<u>г</u> Г	3		
CO3. De	$\frac{1}{1}$	are for getting the Repor	5011walt.			 k	X3 X4		
CO5: Fx	aluating all the	Modules and Prenaring a	complete Documentatio	n		 k	X4		
	anualing all the	modules and Preparing (	complete Documentatio	11		ľ	14		

#### CO & PO Mappings:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	2	2	2	3	3
CO 2	3	2	2	2	1	3
CO 3	3	3	2	2	1	3
<b>CO 4</b>	3	3	2	2	2	2
CO 5	3	3	2	2	2	2

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

## LESSON PLAN

Module	Project And Viva Voce	Hrs	Mode
Ι	<ul><li>Title</li><li>Synopsis</li><li>Introduction</li></ul>	18	Practical
II	<ul><li>Module description</li><li>Existing and proposed system</li></ul>	18	Practical
III	<ul> <li>Data Flow Diagram</li> <li>System Flow Diagram</li> <li>Entity Relationship Diagram</li> </ul>	18	Practical
IV	<ul><li>Form Design</li><li>Database Design</li></ul>	18	Practical
V	<ul><li>Testing</li><li>Implementation</li></ul>	18	Practical Presentation

Course designed by Mr M.Ramesh Kumar & Mrs R.Vasuki



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	<b>CYBER SECURITY</b>							
Course Code	21UCAE61			L	Р	С		
Category	Core Elective			5	-	5		
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENU	RSH	IP	$\checkmark$		
Course Object	ves:							
<ul> <li>To understand key terms and concepts in Cryptography, Governance and Compliance</li> <li>To diagnose and investigate cyber security events or crimes related to computer systems and digital evidence.</li> <li>To exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an organization.</li> <li>To implement Cyber security Best Practices and Risk Management</li> <li>To practice with an expertise in academics to design and implement security solutions.</li> <li>Unit: I Cyber Security Fundamentals 15</li> <li>Network and Security Concepts - Information Assurance Fundamentals - Basic Cryptography - Symmetric Encryption - Public Key Encryption - The Domain Name System(DNS)-Firewalls</li> <li>Unit: II Attacker Techniques and Motivations 15</li> <li>How Hackers Cover Their Tracks(Anti forensics)-Tunneling Techniques-Fraud Techniques-Rogue Antivirus-Click Fraud-Threat Infrastructure.</li> </ul>								
Unit: III Exi	Fraud-Infrastruct	ure			17	7		
Format String Files-PDF File	Vulnerabilities-SQL Inject Format-Creating Malici	ction– Protecting against S ous PDF Files-Reducing t	SQL injection- Mal he risks of Malicio	icious us PE	s PDI DF Fi	F les-		
Race condition	s – Brute Force and Dict	ionary Attacks			11	2		
Self-Replicatir Exploitation-F	g Malicious Code-Rootk orm Grabbing-Man-in-th	its-Spyware-Token Kidna e-Middle Attacks–DLL In	pping- Stealing for ijection	matic	on and	d		
Unit: V Def	ense and Analysis Tech	niques			15	5		
Memory Foren Memory Analy Finding Hidde Analysis Syste	sics-Why Memory Foren sis Frameworks-Dumpin n Processes-Volatility Ar ms-Passive Analysis-Act	nsics Is Important-Capabil ng Physical Memory-Insta nalyst Pack-Honeypots – A tive Analysis	ities of Memory Fo lling and Using Vo Automated Malicion	orensional latilit us Co	cs- y- de			
			1 otal Lecture Ho	urs	/5 H	lrs		
1.James Graha CRC Press,Au	m, Richard Howard and I erbach,Publications,First Unit I : Chapte Unit II : Chapte Unit III : Chapte Unit IV : Chapte Unit V : Chapte	Ryan Olson <b>"CYBER SE</b> Edition,2011 r:1:1.1.1-1.1.6 er:2:2.1-2.3 er:3:3.1.4-3.1.6,3.1.7,3.1.1 er:4:4.1,4.2.4,4.2.5,4.2.7,4 er 5:5.1,5.2,5.4-5.4.1,5.4.2	CURITY ESSEN 0 3.1,4.3.2,4.3.3	ΓIAL	<b>S</b> "			

#### **Books for References:**

- 1. Baloch, R., Ethical HackingandPenetrationTestingGuide, CRCPress, 2015.
- 2. CharlesP.Pfleeger, Shari Lawrence Pfleeger, Jonathan Margulies, Security in Computing, 5thEdition, Pearson Education, 2015
- 3. William, Stallings. (2018). Effective Cyber security: A Guide to Using Best Practices and Standards, Addison Wesley Professional Publishers, 1st Edition.

#### Web Resources: 1.https://onlinecourses.swayam2.ac.in/ugc19\_hs25/preview 2. https://www.edx.org/course/cybersecurity-fundamentals 3.https://www.coursera.org/specializations/cyber-security **Course Outcomes** K Level At the end of the course, the students will able to CO1: Demonstrate the fundamentals about network security **K3** Examine different forms of hacking technique and prevention methods CO2: **K3** Illustrate software vulnerabilities and security solutions to reduce the risk of **CO3**: **K3** exploitation. **CO4:** Compare the performance and troubleshoot cyber security system **K4** Interpret cyber security solutions and use of cyber security, information **CO5**: **K4** assurance, and cyber/computer forensics software/tools

#### CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	3	2
CO 2	3	2	2	2	2	2
CO 3	2	3	2	2	2	2
<b>CO 4</b>	2	2	2	2	2	2
CO 5	2	3	2	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	<b>Cyber Security Fundamentals:</b> Network and Security Concepts - Information Assurance Fundamentals - Basic Cryptography - Symmetric Encryption - Public Key Encryption - The Domain Name System(DNS)- Firewalls	15	Chalk & Talk, ICT Kit
II	Attacker Techniques and Motivations :How Hackers Cover Their Tracks(Anti forensics)-Tunneling Techniques-Fraud Techniques-Rogue Antivirus-Click Fraud-Threat Infrastructure	15	Chalk & Talk, ICT Kit
ш	<b>Exploitation:</b> Format String Vulnerabilities-SQL Injection– Protecting against SQL injection- Malicious PDF Files-PDF File Format-Creating Malicious PDF Files-Reducing the risks of Malicious PDF Files- Race conditions – Brute Force and Dictionary Attacks	17	Chalk & Talk, ICT Kit
IV	MaliciousCode: Self-Replicating Malicious Code-Rootkits-Spyware- Token Kidnapping- Stealing formation and Exploitation-Form Grabbing-Man-in-the-Middle Attacks–DLL Injection	13	Chalk & Talk, ICT Kit
v	<b>DefenseandAnalysisTechniques:</b> Memory Forensics-Why Memory Forensics Is Important-Capabilities of Memory Forensics-Memory Analysis Frameworks-Dumping Physical Memory-Installing and Using Volatility-Finding Hidden Processes-Volatility Analyst Pack-Honeypots – Automated Malicious Code Analysis Systems-Passive Analysis-Active Analysis	15	Chalk & Talk, ICT Kit

## Course Designed by: Mrs.R.Vasuki & Mr M.Ramesh Kumar Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print									
Articulation Mapping – K Levels with Course Outcomes (COs)										
			Section	n A	Section	n B				
Inte		K Level	MCQ	<u>)</u> s	Short An	swers	Section C	Section D		
rnal	Cos		No. of. Questions	K - Level	No. of. Question s	K - Level	Either or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
Question Pattern		No. of Questions to be asked	4		3		4	2		
		No. of Questions to be answered	4		3		2	1		
	1 & 11	Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

**\*Note:** It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

	Distribution of Marks with K Level CIA I & CIA II										
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
	K3	-	-	20	20	40	80	80			
CIA I	K4	-	-	-	-	-	-	-			
	K5	-	-	-	-	-	-	-			
	Marks	4	6	20	20	50	100	100			
	K1	2	-	-	-	2	4	20			
	K2	2	6	-	-	8	16	20			
	K3	-	-	10	10	20	40	40			
CIA II	K4	-	-	10	10	20	40	40			
	K5	-	-	-	-	-	-	-			
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course										
				)s	Short Answers		Section C	Section D			
S.No	COs	K - Level	No. of	K –	No. of	K –	(Either /	(Open			
			Questions	Level	Question	Level	or Choice)	Choice)			
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
No	of Quest. Aske	tions to be ed	10	K1,K2	5	К2	10	5			
No.of Questions to be answered		ions to be pred	10	K1,K2	5	К2	5	3			
Marks for each question		1	K1,K2	2	K2	5	10				
Total Marks for each section		10	K1,K2	10	K2	25	30				
	(Figures	in parenthesi	is denotes, qu	lestions s	hould be as	ked with	the given K	level)			

Distribution of Marks with K Level									
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %		
K1	5		-	-	5	4	16		
K2	5	10	-	-	15	12	10		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	34	34		
Marks	10	10	50	50	120	100	100		
ND. II.	- l l l f		C 4le a star d a st		and has a		hish an Israel		

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

Section	Section A (Multiple Choice Questions)							
Answei	r All Q	uestions	(10x1=10 marks)					
Q.No	CO	K Level	Questions					
1	CO1	K1						
2	CO1	K2						
3	CO2	K1						
4	CO2	K2						
5	CO3	K1						
6	CO3	K2						
7	CO4	K1						
8	CO4	K2						
9	CO5	K1						
10	CO5	K2						
Section	B (Sho	ort Answer	rs)					
Answei	r All Q	uestions	(5x2=10 marks)					
Q.No	CO	K Level	Questions					
11	CO1	K1						
12	CO2	K1						
13	CO3	K2						
14	CO4	K2						
15	CO5	K2						
Section	C (Eit	her/Or Ty	pe)					
Answei	r All Q	uestions	(5 x 5 = 25 marks)					
Q.No	CO	K Level	Questions					
16) a	CO1	K3,K3						
16) b	CO1	K3,K3						
17) a	CO2	K3,K3						
17) b	CO2	K3,K3						
18) a	CO3	K3,K3						
18) b	CO3	K3,K3						
19) a	CO4	K4,K4						
19) b	CO4	K4,K4						
20) a	CO5	K4,K4						
20) b	CO5	K4,K4						
NB: Hi	gher le	vel of perf	ormance of the students is to be assessed by attempting higher					
level of	K leve	ls						
Section	D (Op	en Choice						
Answei	r Any T	Three ques	tions (3x10=30 marks)					
Q.No	CO	K Level	Questions					
21	COl	K3						
22	CO2	K3						
23	<u>CO3</u>	K3						
24	<u>CO4</u>	K4						
25	CO5	K4						

## **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	CLIENT SERVER COMPUTING								
Course Code	21UCAE62				L	Р	С		
Category	Core Elective				5	-	5		
Nature of cours	e: EMPLOYABILITY 🖌 SKILL ORIENT	red	✓	ENTREPREN	URSH	IP	✓		
Course Objecti	ves:			·					
Promote a simple understanding of how to design a Client Server application.									
• Afford learners with a summary of the concepts and fundamentals of client/server									
computin	ng.								
• Identify	the various components of client server app.	licatior	ıs.						
Recogniz	the concept of client/server systems deve	lopmer	nt m	ethodology.					
• Gain a b	etter understanding of new computing parad	igms.							
Unit: I Clie	ent/Server Computing	0			D	15	hrs		
Client/Server C	omputing – Advantages of Client / Server	Compu	iting	g – Technolog	y Rev	olutio	on –		
Connectivity – V	Vays to improve Performance – How to red	uce ne	two	rk Traffic.		1.5			
Unit: II Con	nponents of Client/Server Applications –	The C	Th	t and The Ser	ver	15	hrs		
The Role of the	Client – Client Services – Request for Se	rvice -	In(	e Role of the S	berver	– Se	rver		
Sorver Operation	Detail – The Network Operating System –	w nat a	are t	ine Available P	Tation	ms -	The		
Unit: III Con	2 System.	Conne	oti			15	hra		
Open System I	terconnect Communications Interface Ter	conne		Interprocess (	ommi		tion		
– Wide Area Ne	twork Technologies	linolo	gy-	- interprocess c	Junn	inica	lion		
Unit: IV Clie	nt/Server Systems Development _Softwa	re and	Ha	rdware		15	hrs		
Factors Drivin	g demand – Need to Improve Technolo	$\sigma v = 1$	Nee	d for Platform	n Mie	ratio	n _		
Client/Server S	vstems Development Methodology. Com	onents	of	Client/Server	Appl	icatio	ns-		
Hardware: Hady	vare/Network Acquisition – PC Level Proc	cessing	Un	its – Machinto	sh. no	otebo	oks.		
Pen – UNIX Wo	orkstation – x-terminals – Disk, Tape, Optic	al Disk	s, N	NIC and UPS.	, ,		,		
Unit: V The	Future of Client/Server Computing		,			15	hrs		
Enabling Techr	ologies – Transformational Systems – Eme	ergency	y Pu	ıblic Safety – I	Electro	onic I	Data		
Interchange – Fi	nancial Analysis.			•					
			Tot	tal Lecture Ho	ours	75 H	[ <b>rs</b>		
<b>Books for Stud</b>	y:								
1. Patrick Smith Limited, New D	Steve Guengerich, Client/Server Computi elhi, 2 <sup>nd</sup> Edition, 1994	ng, Pre	entic	e Hall of India	Priva	te			
Unit 1: C	hapters 1.2								
Unit 2: C	Chapters 3.4								
Unit 3. Chapter 5									
Unit 4: Chapters 6.7									
Unit 5: Chapter10									
<b>Books for Refe</b>	rences:						_		
1. Essential Cli	ent/Server Survival Guide, Robert Orfali,	Dan I	Hark	key and Jerri	Edwar	ds, J	ohn		
Wiley &Sons In	c 1996.								

2. A complete guide to Client / Server computing, First Edition, Eric J Johnson, Prentice Hall, New Delhi, 2001.

3. Client And Server Computing, 2nd Edition, Munesh Chandra Trivedi, Khanna Publishing House, 2014.

#### Web Resources:

- <u>https://www.tutorialspoint.com/Client-Server-Computing</u>
- <u>https://www.javatpoint.com/computer-network-client-and-server-model</u>
- <u>https://teachcomputerscience.com/client-server-architecture/</u>

_	https://teacheompaterscience/com/chemt server aremitecture/	
Course	e Outcomes	K Level
At the	e end of the course, the students will be able to	
CO1:	Examine the advantages of client server computing.	K3
<b>CO2:</b>	Discover the components of client server applications.	K3
C03.	Determine the concepts of client server using inter process communication	КЗ
005.	mechanism.	<b>K</b> 3
<b>CO4:</b>	Explain the importance of client/server systems development methodology.	K4
CO5:	Illustrate the future of client/server computing with the latest technologies.	K4

#### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	PO 5	PO 6
CO 1	3	2	2	2	3	2
CO 2	3	2	2	2	2	2
CO 3	2	3	2	2	2	2
<b>CO 4</b>	2	2	2	2	2	2
CO 5	2	3	2	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
I	Client/Server Computing: Client/Server Computing – Advantages of Client / Server Computing – Technology Revolution – Connectivity – Ways to improve Performance – How to reduce network Traffic.	15	PowerPoint Presentation & ICT Tools
П	Components of Client/Server Applications – The Client: The Role of the Client – Client Services – Request for Service. Components of Client/Server Applications – The Server: The Role of the Server – Server Functionality in Detail – The Network Operating System – What are the Available Platforms – The Server Operating system.	15	Lecture & PowerPoint Presentation
ш	Components of Client/Server Applications – Connectivity: Open System Interconnect – Communications Interface Technology – Interprocess communication – Wide Area Network Technologies.	15	Lecture & ICT Tools
IV	<ul> <li>Client/Server Systems Development – Software: Factors Driving demand – Need to Improve Technology – Need for Platform Migration – Client/Server Systems Development Methodology.</li> <li>Components of Client/Server Applications – Hardware: Hadware/Network Acquisition – PC Level Processing Units – Machintosh, notebooks, Pen – UNIX Workstation – x-terminals – Disk, Tape, Optical Disks, NIC and UPS.</li> </ul>	15	PowerPoint Presentation
v	The Future of Client/Server Computing:EnablingTechnologies – Transformational Systems – Emergency PublicSafety – Electronic Data Interchange – Financial Analysis.	15	Lecture

Course Designed by: Mrs. M. Muthulakshmi & Mrs R.Vasuki Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)							
			Formative I	Examinati	on - Blue Pri	nt		
	1	Articulation	Mapping – F	<b>X</b> Levels w	vith Course C	Outcome	s (COs)	
			Sectio	n A	Section	B	Section C	Section D
Inte	Cos	K I evel	MCO	Qs	Short Ans	swers	Fither or	Onen
rnal	CUS	K Level	No. of.	К-	No. of.	К-	Choice	Choice
			Questions	Level	Questions	Level	Choice	enoice
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)
		No. of						
		Questions to be	4		3		4	2
		asked						
		No. of						
Que	stion	Questions to be	4		3		2	1
Pat	tern	answered						
CIA I & II		Marks for each	1		2		5	10
		question	I		4		5	10
		Total Marks						
		for each	4		6		10	10
		section						

	Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
СТА	K3	-	-	20	20	40	80	80
I	K4	-	-	-	-	-	-	-
•	Marks	4	6	20	20	50	100	100
	K1	2	-	-		2	4	20
	K2	2	6	-	-	8	16	20
CIA	K3	-	_	10	10	20	40	40
II	K4	-	_	10	10	20	40	40
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course							
S.No	COs	K - Level	MOC No. of Questions	2s K – Level	Comes (COs)       Short Answers       K –     No. of     K –       Level     Question     Level		Section C (Either / or Choice)	Section D (Open Choice)
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
2	CO2	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
No	of Quest. Aske	ions to be ed	10		5		10	5
No.of Questions to be answered			10		5		5	3
Marks for each question		1		2		5	10	
Total I	Marks for	each section	10		10		25	30
	(Figures	in parenthesi	s denotes, qu	estions s	hould be asl	ked with	the given K	level)

	Distribution of Marks with K Level							
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %	
K1	5		-	-	5	4	16	
K2	5	10	-	-	15	12	10	
K3	-	-	30	30	60	50	50	
K4	-	-	20	20	40	34	34	
Marks	10	10	50	50	120	100	100	
ND. III	rhan laval of n	arfarmanaa	f the student	is to be acc	and by	attomating	highon loval	

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

Section	A (Mu	ltiple Choi	ce Questions)
Answer	All Qu	iestions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section	B (Sho	ort Answer	s)
Answer	All Qu	iestions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eitl	her/Or Typ	pe)
Answer	· All Qu	iestions	(5 x 5 = 25 marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3	
16) b	CO1	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	CO5	K4	
NB: Hig	gher lev	vel of perfo	ormance of the students is to be assessed by attempting higher
level of	K level	S	
Section	D (Op	en Choice)	
Answer	Any T	nree quest	10ns (3x10=30 marks)
<b>Q. No</b>		K Level	Questions
21		K3	
22	$CO_2$	K3 K2	
23	CO3	K3	
24	CO4	K4	
25	CO5	К4	

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	MOBILE COMPUTI	NG						
Course Code	21UCAE63					L	Р	С
Category	Core Elective					5	-	5
Nature of course:EMPLOYABILITYImage: Skill ORIENTEDImage: Skill ORIENTED							IP	✓
Course Objecti	Course Objectives:							
Understa	nd the basic concepts o	f mo	bile computing.					
• Learn th	e basics of mobile telec	omn	nunication system					
• To be fa	miliar with the network	laye	er protocols and Ad-Ho	oc r	etworks			
• Know th	e basis of transport and	appl	lication layer protocols					
Gain kno	wledge about different	mob	oile platforms and appli	icat	ion developmen	nt.		
Unit: I Int	oduction						15	;
Mobility of Bits	&Bytes – Wireless –	The	Beginning – Mobile (	Con	nputing – Dialo	gue (	Contr	ol –
Networks – Mic	dleware and Gateways	– Ap	oplication and Services	— I	Developing mot	oile co	ompu	ting
applications –Se	curity in mobile compu	ting.						
Unit: II Mo	bile Computing Archit	tectu	re and Emerging Teo	hn	ologies		15	;
Internet – The u	biquitous network – Ar	chite	ecture for mobile comp	puti	ng – Three – ti	er arc	hitec	ture
– Design consid	erations for mobile com	puti	ng –Mobile computing	th	ough internet.			
Introduction – E	luetooth– RFID – Wire	less	broadband – MobileIP	- I	PV6 – Javacard	•		
Unit: III Sho	rt Message Service (SI	MS),	, General Packet Rad	io S	Service (GPRS)	)	15	;
Mobile Compu	ting Over SMS – Short	Me	essage Service (SMS)	– V	alue Added Ser	rvices	thro	ugh
SMS – Accessir	g the SMS Bearer.						-	_
Introduction – C	PRS & Packet data ne	twor	k – Network architect	ure	– Network ope	ration	1s - 1	Jata
Services in GPR	S – Applications for GI	2K2	- Limitations of GPRS	). T	NT.		10	
Unit: IV Will	eless Application Prot		(WAP) and wireless			TET		) <u>- 11</u>
Introduction –	WAP – MMS GPKS –	App	fications - wireless I		N: Advantages	– IEE tani	2E80.	2.11 h:1
Adhoa notwork	eless LAN Architecture	x = 1	Virologa I AN Socurity	NIN -	- Deploying w	LAN	-NIO Zabia	blle
Autioc network	Viralass local loop Ui	s —v	AN WIELVORGUS 2C	_	whereas acces	55 III V	enic	ulai
Unit. V Wi	vileiess local loop – Ilij	perL	AN = WIFT VEISUS SO	•			15	
Introduction to	Symbian OS Symbia	$n \Omega$	S Architecture Ann	lica	tions for Symb	ion	Cont	role
and Compound	Controls Active Obje	ur U	Localizations Secu	nca rity	on the Symbia	n OS		atest
in Symbian	controls – Active Obje	cts -	- Localizations – Seeu	iny	on the Symola		- L(	licsi
in Symoun.				То	tal Lecture Ho	urs	75 H	rs
Books for Stud				10		uis	10 11	
						-		
I. Asoke K Applicationsand	Falukder, Hasan Ahn Service Creation",Secc	ned, ond H	RoopaRY avagal, "I Edition, Tata McGraw	Mol Hil	l, NewDelhi, 20	g-Tec 12.	hnolo	ogy,
UnitI: Chapter 1.1to1.9								
Unit 2 :	Chapter 2: 2.3,2.4,2.5,2.	6,3						
	Chapter 4							
Unit 3: C	hapter 6, Chapter 7: 7.	to 7	7.7					
Unit 4: C	hapter 8							

Chapter 10

Unit 5 : Chapter 14

### **Books for References:**

1. William Stallings, "Wireless Communications and Networks", 2<sup>nd</sup> Edition, Pearson Education, Delhi, 2004.

2. Jochenschiller "Mobile communications" Second edition, Pearson 2019

3. UWE Hansmann, Lother Merk, Martin S.Nocklous, Thomas Stober, "Principles of Mobile Computing", 2nd Edition, Springer, 2003.

Web Resources:

- <u>https://www.javatpoint.com/mobile-computing</u>
- <u>https://www.phptpoint.com/mobile-computing-tutorial/</u>
  - https://www.educba.com/mobile-computing-types/

Course	e Outcomes	K Level
At the	e end of the course, the students will be able to	
CO1:	Discover the fundamentals of wireless communications.	K3
CO2:	Illustrate security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.	К3
CO3:	Demonstrate the basic skills for cellular networks design.	K3
<b>CO4:</b>	Examine TCP/IP extensions for mobile and wireless networking	K4
<b>CO5:</b>	Identify the features of Symbian OS.	K4

#### CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	2	3	2
CO 2	3	2	2	2	2	2
CO 3	2	3	2	2	2	2
CO 4	2	2	2	2	2	2
CO 5	2	3	2	2	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

Unit	MOBILE COMPUTING	Hrs	Pedagogy
I	<b>Introduction:</b> Mobility of Bits &Bytes – Wireless – The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and Services – Developing mobile computing applications –Security in mobile computing.	15	Chalk & Talk, ICT Kit
Π	<ul> <li>Mobile Computing Architecture: Internet – The ubiquitous network – Architecture for mobile computing – Three – tier architecture – Design considerations for mobile computing – Mobile computingthrough internet.</li> <li>Emerging Technologies: Introduction – Bluetooth– RFID – Wireless broadband – MobileIP – IPV6 – Javacard.</li> </ul>	15	Chalk & Talk, ICT Kit
Ш	<ul> <li>Short Message Service (SMS): Mobile Computing Over SMS – Short Message Service (SMS) – Value Added Services through SMS – Accessing the SMS Bearer.</li> <li>General Packet Radio Service (GPRS): Introduction – GPRS &amp; Packet data network – Network architecture – Network operations – Data Services in GPRS – Applications for GPRS – Limitations of GPRS.</li> </ul>	15	Chalk & Talk, ICT Kit
IV	<ul> <li>Wireless Application Protocol (WAP): Introduction – WAP – MMS GPRS – Applications.</li> <li>Wireless LAN: Advantages – IEEE802.11 standards – Wireless LAN Architecture – Mobility in wireless LAN – Deploying WLAN –Mobile Adhoc networks and Sensor networks –Wireless LAN.Security – Wireless access inVehicular environment – Wireless local loop – HiperLAN – WIFI versus 3G.</li> </ul>	15	Chalk & Talk, ICT Kit
V	Wireless Devices with Symbian OS: Introduction to Symbian OS – Symbian OS Architecture – Applications for Symbian – Controls and Compound Controls – Active Objects – Localizations – Security on the Symbian OS – Latest in Symbian.	15	Chalk & Talk, ICT Kit

Course Designed by: Mrs. M. Muthulakshmi & M.Ramesh Kumar Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
			Sectio	on A	Section B					
Inte rnal			MC	Qs	Short Ans	swers	Section C	Section D		
	Cos	K Level	No. of. Question s	K - Level	No. of. Questions	K - Level	Either or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
Question Pattern CIA I & II		No. of Questions to be asked	4		3		4	2		
		No. of Questions to be answered	4		3		2	1		
		Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

	Distribution of Marks with K Level CIA I & CIA II											
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %				
	K1	2	-	-		2	4	20				
	K2	2	6	-	-	8	16	20				
СТА	K3	-	-	20	20	40	80	80				
	K4	-	-	-	-	-	-	-				
•	Marks	4	6	20	20	50	100	100				
	K1	2	-	-		2	4	20				
CIA	K2	2	6	-	-	8	16	20				
	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)										
S. No	COs	K - Level	MOC No. of Questions	<u>)s</u> K – Level	Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)			
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)			
No	of Quest. Aske	ions to be ed	10		5		10	5			
No.of Questions to be answered		10		5		5	3				
Marks for each question		1		2		5	10				
Total Marks for each section		10		10		25	30				
	(Figures	in parenthesi	s denotes, qu	estions s	hould be asl	ked with	the given K	level)			

		Dis	stribution of	Marks with	n K Leve	l	
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5		-	-	5	4	16
K2	5	10	-	-	15	12	10
K3	-	-	30	30	60	50	50
K4	-	-	20	20	40	34	34
Marks	10	10	50	50	120	100	100
NR. Hic	than laval of n	orformona a	f the student	s is to be assu	and by	ottomoting	higher lovel

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

Section A	Section A (Multiple Choice Questions)								
Answer	All Que	estions	(10x1=10 marks)						
Q. No	CO	K Level	Questions						
1	CO1	K1							
2	CO1	K2							
3	CO2	K1							
4	CO2	K2							
5	CO3	K1							
6	CO3	K2							
7	CO4	K1							
8	CO4	K2							
9	CO5	K1							
10	CO5	K2							
Section 1	B (Shor	t Answers	)						
Answer	All Que	estions	(5x2=10 marks)						
Q. No	CO	K Level	Questions						
11	CO1	K2							
12	CO2	K2							
13	CO3	K2							
14	CO4	K2							
15	CO5	K2							
Section	C (Eith	er/Or Type	e)						
Answer	All Que	estions	(5  x 5 = 25  marks)						
Q. No	CO	K Level	Questions						
16) a	CO1	K3							
16) b	CO1	K3							
17) a	CO2	K3							
17) b	CO2	K3							
18) a	CO3	K3							
18) b	CO3	K3							
19) a	CO4	K4							
19) b	CO4	K4							
20) a	CO5	K4							
20) b	CO5	K4							
NB: Hig	her lev	el of perfo	rmance of the students is to be assessed by attempting higher						
level of l	K levels	6							
Section 1	D (Ope	n Choice)							
Answer	Any Th	nree questi	ons (3x10=30 marks)						
Q. No	CO	K Level	Questions						
21	CO1	K3							
22	CO2	K3							
23	CO3	K3							
24	<u>CO4</u>	K4							
25	CO5	K4							

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

21UCAE64 Core Elective EMPLOYABILITY ves:	SKILL ORIENTED	✓ ENTREPRENEU	L 5	P -	C 5					
Core Elective EMPLOYABILITY ves:	SKILL ORIENTED	✓ ENTREPRENEU	5	-	5					
EMPLOYABILITY ves:	SKILL ORIENTED	✓ ENTREPRENEU	DOIL							
ves:			EPRENEURSHIP 🗸							
<ul> <li>To introduce to the principles of computer graphics.</li> <li>Understand the need of developing graphics application</li> <li>To give idea about basic building blocks of multimedia</li> <li>Learn algorithmic development of graphics primitives like: line, circle, polygon etc.</li> <li>Learn the representation and transformation of graphical images and picture</li> <li>Unit: I A Survey of Computer Graphics</li> <li>Interface. Overview of Graphics</li> <li>Systems: Video-display devices, Raster-Scan systems, Random- Scan systems- Input Devices-Hard-Copy Devices.</li> <li>Unit: II Output Primitives</li> <li>I5 Hours</li> <li>Points and Lines- Line-Drawing Algorithms – Circle-Generating Algorithms-Ellipse-Generating Algorithms. Attributes of Output Primitives: Line Attributes – Curve Attributes – Area-Fill Attributes – Character Attributes – Bundled Attributes.</li> </ul>										
Attributes – Character Attributes – Bundled Attributes.										
Dimensional Geometr	ic Transformations		<u>17 H</u>	lours	1					
nations – Matrix Rep ng Operations-Point Cli ine Clipping – Polygon – Text Clipping .	pping – Line Clipping: C n Clipping: Sutherland –	Cohen-Sutherland Li Hodgeman Polygo	ne Cl	ippin ippin	g –					
ohical User Interfaces a	and Interactive Input M	ethods	13 H	lours						
gue – Input of Graphic nal Display Methods – 7	al Data – Input Function Three Dimensional Graph	ns. <b>Three Dimensio</b> ics Packages.	nal C	once	epts					
e-Dimensional Geome	tric and Modeling Trans	sformations	15 H	lours						
otation – Scaling – C ences-General Comput uages - Key-Frame Syst	Other Transformations.Co er-Animation Functions- tems - Motion Specification	<b>Omputer Animatio</b> Raster Animations	n: Do - Co	esign ompu	of ter-					
	10	tal Lecture Hours	75 F	Irs						
Y:										
arn, M. Pauline Baker " 1 – 1.1 to 1.8	Computer Graphics C Ve	rsion", Second Editi	on, Po	earso	n					
	dea about basic building gorithmic development of representation and tran rvey of Computer Gra d Design-Presentation of zation-Image Processi -display devices, Raster ces. <b>Dut Primitives</b> s- Line-Drawing Algorit <b>ibutes of Output Primi</b> racter Attributes – Bund <b>Dimensional Geometr</b> nations – Matrix Rep ng Operations-Point Cli ine Clipping – Polygor - Text Clipping . <b>Dincal User Interfaces a</b> gue – Input of Graphic nal Display Methods – 7 <b>e-Dimensional Geomet</b> totation – Scaling – Clipences-General Comput uages - Key-Frame Syster arn, M. Pauline Baker " 1 – 1.1 to 1.8	dea about basic building blocks of multimedia gorithmic development of graphics primitives like erepresentation and transformation of graphical in <b>rvey of Computer Graphics</b> 1 Design-Presentation Graphics – Computer A zation-Image Processing-Graphical User Int -display devices, Raster-Scan systems, Randon ces. <b>Dut Primitives</b> s- Line-Drawing Algorithms – Circle-Generating <b>ibutes of Output Primitives:</b> Line Attributes – C racter Attributes – Bundled Attributes. <b>Dimensional Geometric Transformations</b> mations – Matrix Representations– Other Tra ng Operations-Point Clipping – Line Clipping: C ine Clipping – Polygon Clipping: Sutherland – - Text Clipping . <b>Dhical User Interfaces and Interactive Input M</b> gue – Input of Graphical Data – Input Function nal Display Methods – Three Dimensional Graph <b>e-Dimensional Geometric and Modeling Trans</b> totation – Scaling – Other Transformations.Co ences-General Computer-Animation Functions- uages - Key-Frame Systems - Motion Specificatio <b>To</b> 7: arn, M. Pauline Baker "Computer Graphics C Ver 1 – 1.1 to 1.8	dea about basic building blocks of multimedia gorithmic development of graphics primitives like: line, circle, polygo erepresentation and transformation of graphical images and picture <b>rvey of Computer Graphics</b> 1 Design-Presentation Graphics – Computer Art –Entertainment-E zation-Image Processing-Graphical User Interface. <b>Overview</b> of -display devices, Raster-Scan systems, Random- Scan systems- In ces. <b>Dut Primitives</b> - Line-Drawing Algorithms – Circle-Generating Algorithms-Ellipse- <b>ibutes of Output Primitives:</b> Line Attributes – Curve Attributes – A racter Attributes – Bundled Attributes. <b>Dimensional Geometric Transformations</b> mations – Matrix Representations– Other Transformations. Two ng Operations-Point Clipping – Line Clipping: Cohen-Sutherland Li ine Clipping – Polygon Clipping: Sutherland – Hodgeman Polygo - Text Clipping . <b>bhical User Interfaces and Interactive Input Methods</b> gue – Input of Graphical Data – Input Functions. <b>Three Dimension</b> and Display Methods – Three Dimensional Graphics Packages. <b>e-Dimensional Geometric and Modeling Transformations</b> totation – Scaling – Other Transformations. <b>Computer Animatio</b> totation – Scaling – Other Transformations. <b>Computer Animatio</b> uages - Key-Frame Systems - Motion Specifications <b>Total Lecture Hours</b> <b>7</b> : arn, M. Pauline Baker "Computer Graphics C Version", Second Editi - 1-1 to 1.8	dea about basic building blocks of multimedia (orithmic development of graphics primitives like: line, circle, polygon etc. erepresentation and transformation of graphical images and picture rvey of Computer Graphics       15 H         I Design-Presentation Graphics – Computer Art –Entertainment-Educat zation-Image Processing-Graphical User Interface.Overview of G -display devices, Raster-Scan systems, Random- Scan systems- Input I ces.       15 H         out Primitives       15 H         s- Line-Drawing Algorithms – Circle-Generating Algorithms-Ellipse-Gene ibutes of Output Primitives: Line Attributes – Curve Attributes – Area-F racter Attributes – Bundled Attributes.       17 H         Dimensional Geometric Transformations       17 H         nations – Matrix Representations– Other Transformations. Two-Dim g Operations-Point Clipping – Line Clipping: Cohen-Sutherland Line Cliping – Polygon Clipping: Sutherland – Hodgeman Polygon Cli- rext Clipping .       13 H         ohical User Interfaces and Interactive Input Methods       13 H         gue – Input of Graphical Data – Input Functions.Three Dimensional Conal Display Methods – Three Dimensional Graphics Packages.       15 H         e-Dimensional Geometric and Modeling Transformations       15 H         otation – Scaling – Other Transformations.Computer Animation: D       15 H         nat Display Methods – Three Dimensional Graphics Packages.       15 H         e-Dimensional Geometric and Modeling Transformations       15 H         otation – Scaling – Other Transformations.Computer Animation: D       20	dea about basic building blocks of multimedia (orithmic development of graphics primitives like: line, circle, polygon etc. (orithmic development of graphics primitives like: line, circle, polygon etc. (or representation and transformation of graphical images and picture (or rever of Computer Graphics)       15 Hours         1 Design-Presentation Graphics       Computer Art –Entertainment-Education (oright)       15 Hours         1 Design-Presentation Graphics       Computer Art –Entertainment-Education (oright)       15 Hours         2 display devices, Raster-Scan systems, Random- Scan systems- Input Devices.       15 Hours         but Primitives       15 Hours         s- Line-Drawing Algorithms – Circle-Generating Algorithms-Ellipse-Generatin ibutes of Output Primitives: Line Attributes – Curve Attributes – Area-Fill racter Attributes – Bundled Attributes.       17 Hours         Dimensional Geometric Transformations       17 Hours         nations – Matrix Representations– Other Transformations. Two-Dimensic rag Operations-Point Clipping – Line Clipping: Cohen-Sutherland Line Clippin - Text Clipping .       13 Hours         bildeal User Interfaces and Interactive Input Methods       13 Hours         gue – Input of Graphical Data – Input Functions. Three Dimensional Conce nal Display Methods – Three Dimensional Graphics Packages.       15 Hours         e-Dimensional Geometric and Modeling Transformations       15 Hours         otation – Scaling – Other Transformations.Computer Animation: Design ences-General Computer-Animation Functions-Raster Animations - Computages - Key-Frame System					

	Chapter 6 – 6.5- 6.10						
Unit IV	7: Chapter 8 – 8.1- 8.3						
	Chapter 9 – 9.1,9.2						
Unit V	: Chapter 11 – 11.1- 11.4						
	Chapter 16-16.1 to 16.6						
Books	for References:						
1. Com	puter Graphics, Sunil Kumar Sharma, Manoj Singhal, Pearson Education, 2014	•					
2. F.S.	Hill, Computer Graphics using OPENGL, Second edition, Pearson Education,	2003.					
3.Jame	s D. Foley, Andries Van Dam, Steven K. Feiner, John F. Hughes, Computer Gr	aphics-					
Princip	Principles and practice. Second Edition in C. Pearson Education. 2007.						
Web Resources:							
1.	https://www.javatpoint.com/computer-graphics-tutorial						
2.	https://www.geeksforgeeks.org/introduction-to-computer-graphics/						
3.	https://www.britannica.com/topic/computer-graphics/Shading-and-textu	ring					
Course	e Outcomes	K Level					
At the	end of the course the students will be able to						
CO1	Demonstrate computer graphics applications common graphics APIs.	К3					
<b>CO3</b>	Examine various algorithms to scan, convert the basic geometrical	17.3					
002	primitives, transformations, Area filling, clipping.	K3					
CO3	Illustrate about 3D modeling and rendering techniques	К3					
<b>CO4</b>	Analyze the theory of 2D and 3D transformations, projection and viewing	K4					
0.05	Develop the application of computer graphics concepts in the development	<b>T</b> Z <b>A</b>					
005	of computer games, information visualization, and business applications	K4					

#### CO & PO Mapping:

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	2	1	2
CO 2	2	3	3	2	2	1
CO 3	2	3	3	3	2	2
<b>CO 4</b>	2	3	2	2	3	2
CO5	3	2	3	3	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

Unit	COMPUTER GRAPHICS	Hrs	Pedagogy
I	A Survey of Computer Graphics:Computer–Aided Design- Presentation Graphics – Computer Art –Entertainment-Education and Training-Visualization-Image Processing-Graphical User Interface. Overview of Graphics Systems: Video-display devices, Raster-Scan systems, Random- Scan systems- Input Devices-Hard-Copy Devices.	15	Chalk & Talk, ICT Kit
п	Output Primitives :Basic Transformations – Matrix Representations– Other Transformations. Two-Dimensional Viewing: Clipping Operations-Point Clipping – Line Clipping: Cohen-Sutherland Line Clipping – Liang Barsky Line Clipping – Polygon Clipping: Sutherland – Hodgeman Polygon Clipping – Curve Clipping – Text Clipping	15	Chalk & Talk, ICT Kit
III	Two-DimensionalGeometricTransformations:BasicTransformations – Matrix Representations– Other Transformations.Two-Dimensional Viewing: Clipping Operations-Point Clipping – LineClipping:Cohen-SutherlandLineClipping – LiangBarskyLineClipping – LiangBarskyClipping – Polygon Clipping:Sutherland – Hodgeman Polygon Clipping– Curve Clipping – TextClipping	17	Chalk & Talk, ICT Kit
IV	Graphical User Interfaces and Interactive Input Methods: The User Dialogue – Input of Graphical Data – Input Functions. Three Dimensional Concepts Three-Dimensional Display Methods – Three Dimensional Graphics Packages.	13	Chalk & Talk, ICT Kit
V	Three-DimensionalGeometricandModelingTransformations: Translation–Rotation–Scaling–Transformations. ComputerAnimation:DesignofAnimationSequences-General Computer-Animation Functions-Raster Animations-Computer-Animation-Computer-AnimationLanguages-Key-FrameSystems-MotionSpecifications	15	Chalk & Talk, ICT Kit

# Course Designed by:Mrs.R.Vasuki & M.Muthlakshmi Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)										
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)										
_			Section	n A	Section B			~ ~ ~			
Inte			MCC	<u>Qs</u>	Short An	swers	Section C	Section D			
rna l	Cos	K Level	No. of. Questions	K - Level	No. of. Question s	K - Level	Either or Choice	Open Choice			
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)			
Question Pattern CIA I & II		No. of Questions to be asked	4		3		4	2			
		No. of Questions to be answered	4		3		2	1			
		Marks for each question	1		2		5	10			
		Total Marks for each section	4		6		10	10			

\*Note: It is the decision of the course teacher to ask 2 Questions in any unit under section-B (short answer questions)

		Dist	ribution of M	larks with	K Level	CIAI&	CIA II	
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
	K1	2	2	-	-	4	8	20
	K2	2	4	-	-	6	12	20
	K3	-	-	20	20	40	80	80
CIA	K4	-	-	-	-	-	-	-
Ι	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	50		100
	K1	2	2	-	-	4	8	20
	K2	2	4	-		6	12	20
СТА	K3	_	_	10	10	20	40	40
II II	K4	-	-	10	10	20	40	40
	K5	-	-	-	-	-	-	-
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)											
			MO	licomes ( ls	Short An	swers	Section C	Section D				
S. No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	(Open Choice)				
1	CO1	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
2	CO2	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
3	CO3	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)				
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)				
No. of Questions to be Asked		10	K1,K2	5	K2	10	5					
No. of Questions to be answered			10	K1,K2	5	K2	5	3				
Marks for each question		1	K1,K2	2	K2	5	10					
Total Marks for each section			10	K1,K2	10	K2	25	30				
	(Figures	in parenthesi	s denotes, qu	estions s	hould be as	ked with	the given K	level)				

Distribution of Marks with K Level												
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %					
K1	5		-	-	5	4	16					
K2	5	10	-	-	15	12	10					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	34	34					
Marks	10	10	50	50	120	100	100					
NB: Higher level of performance of the students is to be assessed by attempting higher level												
of K levels.												

Section A	Section A (Multiple Choice Questions)							
Answer All Questions(10x1=10 marks)								
Q. No	CO	K Level	Questions					
1	CO1	K1						
2	CO1	K2						
3	CO2	K1						
4	CO2	K2						
5	CO3	K1						
6	CO3	K2						
7	CO4	K1						
8	CO4	K2						
9	CO5	K1						
10	CO5	K2						
Section 1	B (Shor	t Answers	)					
Answer	All Que	estions	(5x2=10 marks)					
Q. No	CO	K Level	Questions					
11	CO1	K1						
12	CO2	K1						
13	CO3	K2						
14	CO4	K2						
15	CO5	K2						
Section	C (Eith	er/Or Type	e)					
Answer	All Que	estions	(5  x  5 = 25  marks)					
Q. No	CO	K Level	Questions					
16) a	CO1	K3,K3						
16) b	CO1	K3,K3						
17) a	CO2	K3,K3						
17) b	CO2	K3,K3						
18) a	CO3	K3,K3						
18) b	CO3	K3,K3						
19) a	CO4	K4,K4						
19) b	CO4	K4,K4						
20) a	CO5	K4,K4						
20) b	CO5	K4,K4						
NB: Hig	her lev	el of perfoi	rmance of the students is to be assessed by attempting higher					
level of l	<u> Levels</u>							
Section	D (Ope	n Choice)						
Answer	Any Tr	ree questi	ons (3x10=30 marks)					
<b>Q. No</b>		K Level	Questions					
21		K3						
22	CO2	K3						
23	CO3	K3						
24	CO4	K4						
25	005	К4						

# **Summative Examinations - Question Paper – Format**



### MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Nam	e	SOFTWARE TESTING									
Course Code		21UCAE65	L	Р	С						
Category		Core Elective	5	-	5						
Nature of cours		EMPLOYABILITY 🗸 SKILL ORIENTED 🗸 ENTREPRENU	RSH	P	✓						
Course Objectives:											
1. Employ co	rrec	testing terminology throughout the testing process.									
2. Execute sp	ecif	c software tests with well-defined objectives and targets.									
3. Apply varie	ous	testing techniques, including domain, code, fault, usage and model-ba	ased.								
4. Execute pro	ogra	m and test evaluations.									
5. Perform a C	com	blete testing process, taking into account practical considerations.		1.5							
Unit: I S	0110	Are Development Life cycle Models	Mada	15	)						
Phases of Soft	war	Project -Assurance and Quality control - Different Phases-Life Cycle R	viode	IS.							
Definition of	2 XX71	box resung	n W/ł	15 Vito I							
Testing <b>Blac</b>	l VVI	ox Testing - State Testing - Structural Testing - Chanenges I	li wi box t	octin	JUX						
How do blac	k bo	v testing. Definition of Black Box Testing-when to do black	υσχ ι	estin	<u>g</u> -						
Init. III I	ntor	ration Testing		15							
Definition of	Inte	gration Testing - Integration testing as a type of testing - Integration t	testin	σ as	, ภ						
phase of testi	ng -	Scenario Testing - Defect Bash	cotin	g us	u						
Unit: IV S	vste	m and Acceptance Testing		15							
System testir	12 0	verview - Why is system testing done - Functional versus Non Funct	ional	Test	ing						
- Functional	Svs	em Testing - Non - Functional Testing - Acceptance Testing -	Sum	mary	of						
Testing phase	s.	6		5	-						
Unit: V P	Perf	ormance Testing and Regression Testing		15	;						
Factors gover	ming	performance testing - methodology for performance testing - tools f	or								
performance	testi	ng - Process for Performance testing. Regression Testing : Definitio	n of								
Regression T	estir	g -									
		Total Lecture Hou	irs '	75 H	rs						
Books for St	udy										
1.Srinivasan	Desi	kan and Gopalaswamy Ramesh, "Software Testing Principles and									
Practices", Pe	earso	n Edition, 2014.									
UNIT I : Chapter 2											
UNIT II : Chapter 3,4											
UNIT III : Chapter 5											
UNIT IV : Chapter 6											
UNIT V : Chapter 7,8											
Books for Re	efere	ences:									
1. William Perry, "Effective Methods for Software Testing", John Wiley & Sons											
2. Richard E. Fairly, "Software Engineering Concepts", McGraw Hill Edition											
#### Web Resources:

- 1. <u>https://www.tutorialspoint.com/software\_testing/index.htm</u>
- 2. <u>https://www.softwaretestinghelp.com/manual-testing-tutorial-1/</u>
- 3. https://www.w3schools.in/software-testing/tutorials/

# Course OutcomesK LevelAt the end of the course, the students will be able toCO1: Examining SDLC and motivation for testingK3CO2: Determine the types of testing.K3CO3: Implement the characteristics of system testing and integration testingK3CO4: Analyze Understand System and Acceptance Testing.K4CO5: Analyze SDLC and motivation for testingK4

### CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	1	2
CO 2	2	3	3	2	2	1
CO 3	2	3	3	3	2	2
CO 4	2	3	2	2	3	2
CO 5	3	2	3	3	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
	Phases of Software Project -Assurance and Quality control - Different Phases-	15	PPT /
Ι	Life Cycle Models.	13	CHALK
			& TALK
	Definition of White Box Testing – Static Testing – Structural Testing –		
п	Challenges in White Box Testing, Black Box Testing: Definition of	15	PPT /
11	Black Box Testing-When to do black box testing - How do black box	13	CHALK
	testing.		& TALK
	Definition of Integration Testing - Integration testing as a type of testing		
тт	- Integration testing as a phase of testing - Scenario Testing - Defect	15	PPT /
	Bash.	15	CHALK
			& TALK
	System testing overview - Why is system testing done - Functional		PPT /
IV	versus Non Functional Testing - Functional System Testing - Non -	15	CHALK
	Functional Testing - Acceptance Testing - Summary of Testing phases.		& TALK
	Factors governing performance testing - methodology for performance		PPT /
V	testing - tools for performance testing - Process for Performance	15	CHALK
	testing. Regression Testing : Definition of Regression Testing -		& TALK

Course Designed by: Mrs.G.Mahalakshmi Mrs R.Vasuki Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE)									
	Articulation Mapping – K Levels with Course Outcomes (COs)									
			Sectio	on A	Section	B				
Inte			MC	Qs	Short Ans	swers	Section C	Section D		
rnal C	Cos	K Level	No. of. Question s	K - Level	No. of. Questions	K - Level	Either or Choice	Open Choice		
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	К3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)		
		No. of Questions to be asked	4		3		4	2		
Question Pattern CIA I & II		No. of Questions to be answered	4		3		2	1		
		Marks for each question	1		2		5	10		
		Total Marks for each section	4		6		10	10		

	Distribution of Marks with K Level CIA I & CIA II									
	KSection ASection BSection CSection D% ofK(Multiple Choice(Short Answer(Either / Or Choice)Section D (Open Choice)Total Marks% of (Marks							Consolidate of %		
	K1	2	-	-		2	4	20		
	K2	2	6	-	-	8	16	20		
СТА	K3	-	-	20	20	40	80	80		
I	K4	-	-	-	-	-	-	-		
-	Marks	4	6	20	20	50	100	100		
	K1	2	-	-		2	4	20		
	K2	2	6	-	-	8	16	20		
CIA	K3	_	_	10	10	20	40	40		
II	K4	_	_	10	10	20	40	40		
	Marks	4	6	20	20	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	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)							
S. No	COs	K - Level	MO( No. of Questions	)s K – Level	Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)
No	of Quest. Aske	ions to be ed	10		5		10	5
No. of Questions to be answered			10		5		5	3
Marks for each question		1		2		5	10	
Total Marks for each section			10		10		25	30
	(Figures	in parenthesi	s denotes, qu	estions s	hould be asl	ked with	the given K	level)

	Distribution of Marks with K Level								
K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either/ or Choice)	Section D ( Open Choice)	Total Marks	% of (Marks without choice)	Consolidated %		
K1	5		-	-	5	4	16		
K2	5	10	-	-	15	12	10		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	34	34		
Marks	10	10	50	50	120	100	100		
ND. III	rhan laval of n	arfarmanaa	f the student	is to be ass	and here	ttomating	high on loval		

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

Section A	A (Mul	tiple Choic	ce Questions)
Answer	All Qu	estions	(10x1=10 marks)
Q. No	CO	K Level	Questions
1	CO1	K1	
2	CO1	K2	
3	CO2	K1	
4	CO2	K2	
5	CO3	K1	
6	CO3	K2	
7	CO4	K1	
8	CO4	K2	
9	CO5	K1	
10	CO5	K2	
Section 1	B (Shor	rt Answers	)
Answer	All Qu	estions	(5x2=10 marks)
Q. No	CO	K Level	Questions
11	CO1	K2	
12	CO2	K2	
13	CO3	K2	
14	CO4	K2	
15	CO5	K2	
Section	C (Eith	er/Or Typ	e)
Answer	All Qu	estions	(5  x  5 = 25  marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3	
16) b	COI	K3	
17) a	CO2	K3	
17) b	CO2	K3	
18) a	CO3	K3	
18) b	CO3	K3	
19) a	CO4	K4	
19) b	CO4	K4	
20) a	CO5	K4	
20) b	05		
NB: Hig	her lev	el of perfo	rmance of the students is to be assessed by attempting higher
level of I	K levels		
Section	D (Ope	n Choice)	(2::10, 20 montrs)
Answer	Any Ir	Iree questi	Ons (3x10=30 marks)
<b>Q. NO</b>	C01	K Level	Questions
21	CO1	K3 K2	
22	$CO_2$	K3 K2	
23	$CO_4$	K1	
24	C04	K4 1/4	
		<u>n4</u>	

## **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name	BIG DATA ANALYT	ICS					
Course Code	21UCAE66				L	P	С
Category	Core Elective				5	-	5
Nature of cour	se: EMPLOYABILITY	✓ SKILL ORIENTED	✓ EI	NTREPRENU	J <b>RSH</b>	IP	✓
Course Objec	ives:						
• Unders	and the Big Data Platforn	m and its Use cases					
Provide	an overview of Apache I	Hadoop					
Provide	HDFS Concepts and Inte	erfacing with HDFS					
• Unders	and Map Reduce Jobs						
Provide	hands on Hadoop Eco S	ystem					
Unit: I Ty	pes of Digital data					15	5
Classification	of Digital Data. <b>Introdu</b>	ction to Big Data: Chara	cterist	tics of Data -	– Evo	olutio	n of
Big Data – D	finition of Big Data – (	Challenges with Big Data	-Wh	at is Big Dat	ta – 1	Big I	Data
Analytics - W	hat is Big Data Analytics	s – Classification of Analy	tics –	Top challen	ges fa	acing	Big
Data – Importa	nce of Big Data Analytic	cs – Data Science – Data S	Scient	ist – Termino	ologie	s use	d in
Big Data Envi	onment						
Unit: II Th	e Big Data Technology	Landscape and Hadoop			1 .	20	
NoSQL – Typ	es of NoSQL Database –	Advantages of $NOSQL - I$	Use of	I NOSQL IN II	naust	ry — 3	SQL
VSINOSQL – (	omparison of SQL, N	losQL and NewSQL. H	ladooj	<b>p</b> : Features	OI H		р –
Advantages of	Hadoop – Overview of F	adoop Ecosystems – Had	Jistom	s SQL – Integ	grate	1 Hac	100p
Judeon Lud	op distributors UDES	Brocossing data with U	adoon	y of Hauoop			ond
Application wi	h Hadoon VARN	- The solid state with The	auoop	- Managing	10500	urces	anu
Init. III In	roduction to Cassandra	1				10	
Apache Cassar	dra – an introduction-Fea	utures of cassandra – COL	data t	vpes – COLS	SH-K	ev sn	, aces
– CRUD– Coll	ectons-Using a counter –	Time to live – Alter com	nands	– Import and	Expo	ort_	Man
Reduce.			lunus	import und	Enpe		P
Unit: IV In	roduction to Hive and I	Machine Learning				15	5
What is Hive	- Hive Architecture -H	live Data types -Hive File	e Forn	nat-Hive Oue	erv la	ngua	ge -
Introduction	to Machine Learning:	Introduction – Machine	Learn	ning Definition	on –	Mac	hine
Learning Algo	rithms – Regression M	lodel – Linear Regressio	on – (	Clustering –	Coll	abora	ative
Filtering – Ass	ociation Rule Mining – D	Decision Tree.		_			
Unit: V In	roduction to Pig					15	5
What is Pig -	The anatomy of Pig - I	Pig on hadoop - Pig latin	overv	view - Data	types	in F	Pig -
Running Pig –	Execution modes of Pig -	- HDFS commands - Rela	ationa	l Opeartors –	Eval	Func	tion
- Complex dat	a types.						
			Total	Lecture Ho	urs	75 H	Irs
<b>Books for Stu</b>	ly:						
1.Seema Achar	ya, Subhashini Chellappa	an, Big Data and Analytics	, Wile	ey, 2019, New	v Dell	ni.	
Unit I -	Chapter 1- 1.1		10				
1	Chapter 2 - 2.1 To 2.5,	3.2, 3.5, 3.8, 3.9, 3.10 to 3	.12				
Academic	Council Meeting Held O	n 20.04.2023			Pag	ge 17	1

	Unit II - Chapter 4 – 4.1 & 4.2	
	Chapter 5 - 5.4,5.6,5.7,5.9 to 5.12	
	Unit III -Chapter 7 - 7.1 to 7.11	
	Chapter 8	
	Unit IV-Chapter 9	
	Chapter 12	
	Unit V- Chapter 10	
Books	for References:	
1. DT	Editorial Services, Big Data, Black book, Ninth Edition, Dreamtech, 2016, New 1	Delhi.
2. Big	Data, Black Book: Covers Hadoop 2, MapReduce, Hive, YARN, Pig, R and Data	
Visuali	zation (2016), DT Editorial Services	
3. Tom	White, Hadoop: The Definitive Guide, 4th Edition (2015)	
Web F	Resources:	
1.	https://www.tutorialspoint.com/big_data_analytics/index.htm	
2.	https://www.javatpoint.com/what-is-big-data	
3.	https://intellipaat.com/blog/big-data-tutorial-for-beginners/	
Course	e Outcomes	K Level
At the	e end of the course, the students will be able to	
CO1.	Implementation of Big Data Analytics using pig and spark to solve data	V2
COI	intensive problems and to generate analytics	K3
CO2:	Implement Big Data Activities using Hive.	К3
<b>CO</b> 2.	Determining Algorithms to solve Data Intensive Problems using Map Reduce	W3
CO3:	Paradigm	K3
COA	Analyze the Big Data framework like Hadoop and NOSQL to efficiently store	TZ A
CO4:	and process Big Data to generate analytics	K4
CO5:	Explaining Big Data and its analytics in the real world	K4

#### CO & PO Mapping:

COS	PO 1	PO 2	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO 1	3	2	2	2	1	2
CO 2	2	3	3	2	2	1
CO 3	2	3	3	3	2	2
<b>CO 4</b>	2	3	2	2	3	2
CO 5	3	2	3	3	2	3

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

LESS	ON	PLAN	[

Unit	Course Name	Hrs	Pedagogy
I	Classification of Digital Data. <b>Introduction to Big Data</b> : Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data –What is Big Data – <b>Big Data Analytics</b> – What is Big Data Analytics – Classification of Analytics – Top challenges facing Big Data – Importance of Big Data Analytics – Data Science – Data Scientist – Terminologies used in Big Data Environment	15	PPT / CHALK & TALK
п	NoSQL – Types of NoSQL Database – Advantages of NoSQL – Use of NoSQL in Industry – SQL vsNoSQL – Comparison of SQL, NoSQL and NewSQL. <b>Hadoop</b> : Features of Hadoop – Advantages of Hadoop – Overview of Hadoop Ecosystems – Hadoop vs SQL – Integrated Hadoop System – Cloud-Based Hadoop Solutions.RDBMS vs Hadoop – History of Hadoop – Overview of Hadoop-– Hadoop distributors – HDFS – Processing data with Hadoop – Managing resources and Application with Hadoop YARN.	20	PPT / CHALK & TALK
III	<b>Introduction to Cassandra</b> – Apache Cassandra – an introduction- Features of cassandra – CQL data types – CQLSH-Key spaces – CRUD– Collectons-Using a counter – Time to live – Alter commands – Import and Export– Map Reduce.	10	PPT / CHALK & TALK
IV	<b>Introduction to Hive:</b> What is Hive - Hive Architecture -Hive Data types -Hive File Format-Hive Query language - <b>Introduction to Machine Learning</b> : Introduction – Machine Learning Definition – Machine Learning Algorithms – Regression Model – Linear Regression – Clustering – Collaborative Filtering – Association Rule Mining – Decision Tree.	15	PPT / CHALK & TALK
V	<b>Introduction to Pig:</b> What is Pig - The anatomy of Pig - Pig on hadoop - Pig latin overview - Data types in Pig - Running Pig – Execution modes of Pig – HDFS commands – Relational Opeartors – Eval Function – Complex data types.	15	PPT / CHALK & TALK

Course Designed by: Mrs.G.Mahalakshmi & Mrs M.Muthulakshmi

Learning Outcome Based Education & Assessment (LOBE)											
	Formative Examination - Blue Print										
	1	Articulation N	lapping – I	K Levels w	with Course C	Dutcome	s (COs)				
			Sectio	on A	Section	B					
Inte			MC	Qs	Short Ans	swers	Section C	Section D			
rnal	Cos	K Level	No. of. Questio ns	K - Level	No. of. Questions	K - Level	Either or Choice	Open Choice			
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	К3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	<b>CO4</b>	K4	2	K1,K2	2	K2	2(K4,K4)	1(K4)			
Question Pattern		No. of Questions to be asked	4		3		4	2			
		No. of Questions to be answered	4		3		2	1			
	1 & 11	Marks for each question	1		2		5	10			
		Total Marks for each section	4		6		10	10			

	Distribution of Marks with K Level CIA I & CIA II									
	K Level	Section A (Multiple Choice Questions)	Section B (Short Answer Questions)	Section C (Either / Or Choice)	Section D (Open Choice)	Total Marks	% of (Marks without choice)	Consolidate of %		
	K1	2	-	-		2	4	20		
	K2	2	6	-	-	8	16	20		
СТА	K3	-	-	20	20	40	80	80		
	K4	-	-	-	-	-	-	-		
•	Marks	4	6	20	20	50	100	100		
	K1	2	-	-		2	4	20		
CIA	K2	2	6	-	-	8	16	20		
	K3	-	-	10	10	20	40	40		
II	K4	-	_	10	10	20	40	40		
	Marks	4	6	20	20	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	MO( No. of Questions	<u>liconics</u> <u>ls</u> K – Level	Short An No. of Question	swers K – Level	Section C (Either / or Choice)	Section D (Open Choice)	
1	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
2	CO2	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
3	CO3	K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
4	CO4	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)	
5	CO5	K4	2	K1,K2	1	K2	2(K4,K4)	1(K4)	
No. of Questions to be Asked			10		5		10	5	
No. of Questions to be answered			10		5		5	3	
Marks for each question			1		2		5	10	
Total I	Marks for	each section	10		10		25	30	
(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 (Short Answer Questions)	Section C (Either/ or Choice)	C Section D ( Open Choice) Total Marks		% of (Marks without choice)	Consolidated %		
K1	5		-	-	5	4	16		
K2	5	10	-	-	15	12	10		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	34	34		
Marks	10	10	50	50	120	100	100		
NB: Higher level of performance of the students is to be assessed by attempting higher level									
of K lev	els.								

Section	A (Mu	ltiple Choi	ice Questions)				
Answer	All Qu	iestions	(10x1=10 marks)				
Q. No	CO	K Level	Questions				
1	CO1	K1					
2	CO1	K2					
3	CO2	K1					
4	CO2	K2					
5	CO3	K1					
6	CO3	K2					
7	CO4	K1					
8	CO4	K2					
9	CO5	K1					
10	CO5	K2					
Section	B (Sho	rt Answer	s)				
Answer	· All Qu	iestions	(5x2=10 marks)				
Q. No	CO	K Level	Questions				
11	CO1	K2					
12	CO2	K2					
13	CO3	K2					
14	CO4	K2					
15	CO5	K2					
Section	C (Eitl	her/Or Typ	pe)				
Answer	All Qu	iestions	(5  x 5 = 25  marks)				
Q. No	CO	K Level	Questions				
16) a	CO1	K3					
16) b	CO1	K3					
17) a	CO2	K3					
17) b	CO2	K3					
18) a	CO3	K3					
18) b	CO3	K3					
19) a	CO4	K4					
19) b	CO4	K4					
20) a	CO5	K4					
20) b	CO5	K4					
NB: Hi	gher lev	vel of perfo	ormance of the students is to be assessed by attempting higher				
level of	level of K levels						
Section D (Open Choice)							
Answe	r Any T	hree ques	tions (3x10=30 marks)				
<b>Q. No</b>		K Level	Questions				
21	COI	K3					
22	CO2	K3					
23	CO3	K3					
24	CO4	K4					
25	CO5	K4					

# **Summative Examinations - Question Paper – Format**



## MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) DEPARTMENT OF COMPUTER APPLICATIONS (For those who joined in 2021-2022 and after)

Course Name			ANDROID DEVELOPMENT LAB									
Course	e Code	2	21UCASP6 L								Р	С
Catego	ory	5	Skilled 2							-	2	
Nature	of cou	rse:	EMPLOYABILIT	Y	✓	SKILL ORIE	NTED	✓	ENTREPREN	URSH	IP	✓
Course	e Objec	etiv	s:						1			I
•	To gain	n kı	owledge of installi	ng A	And	lroid Studio a	nd Cross	Pla	tform Integrate	d Dev	elopr	nent
Environment												
•	Creatin	the	asics of Android p	natio	orn	and learn how	nderstand	the	them with othe	ecycle	ices	
•	Creatin	ig i ig i	tuitive, reliable mo	bile	e an	ons using the a	android se	ervi	ces and compo	nents	ices	
•	Design	ing	of User Interface a	nd I	Lay	outs for Andr	oid App.	01 1 1	ees une compo	lienes		
1	D	ispl	ying "Welcome to	) An	dro	oid Laboratory	/"					
2	Cı	reat	e an application that	nt tal	kes	the name from	m a text b	ox	and shows hell	О		
	m	essa	ge along with the r	nam	e ei	ntered in text	box, whe	n th	e user clicks th	e OK		
2	bu	itto	l ( C1 11:	1								
3		iffe	ent ways of handli	ng t	outt	on						
		ick iffe	ent ways of handli	no h	nitte	on						8
	cl	ick	event.	ing c	Juli	on						Ū
	D	iffe	ent ways of handli	ng t	outt	on						
	cl	ick	event.	-								
	D	iffe	ent ways of handli	ng t	outt	on						
	cl	ick	event.									
		iffe	ent ways of handli	ng t	outt	on						
4	C	reat	simple and effect	ive l	ا م	tin form on A	ndroid					
5		reat	e registration form	in a	ndr	oid	narota					7
6	D	eve	op an application t	hat	use	s GUI compo	nents For	nt ar	nd Colors			
			1 11			ł						
7	De	esig	a simple User Inter	face	lay	rout						
8	D	evelop simple toast							6			
9	Bı	uild	android app using W	<i>'</i> idge	et							
10				• 1		1					- <u> </u>	
10		eve	op Calculator And	roid	ap]	plication	uttona					6
11	In	onle	ment the notification			Sillg Kaulo D	id					
12		reat	e Simple Browser		one							3
			~					]	Fotal Lecture 1	Hours	30	Hrs
	I										•	
Web F	Resourc	es:										
1. <u>h</u>	ttps://v	vwv	.tutorialspoint.co	m/a	nd	roid/index.ht	<u>m</u>					
2. h	ttps://d	leve	loper.android.con	<u>n/tr</u>	aini	ing/basics/fir	<u>stapp</u>					

3. https://www.javatpoint.com/android-tutorial							
Course	Course Outcomes						
At the end of the course, the students will be able to							
<b>CO1:</b>	Discover the basic concepts of Android platform	K3					
CO2:	Practice simple GUI applications, use built-in widgets and components, work						
	with the database to store data locally and much more	KJ					
CO3:	Design and develop user interfaces for the Android platform.	K3					
<b>CO4:</b>	Develop rich user Interfaces by using layouts and controls	K4					
CO5:	Apply a mobile development framework to the development of a mobile						
	application						

#### CO & PO Mapping:

COS	<b>PO 1</b>	PO 2	<b>PO 3</b>	PO 4	PO 5	<b>PO 6</b>
CO 1	2	2	2	1	2	3
CO 2	2	2	1	2	1	3
CO 3	2	2	2	2	2	2
<b>CO 4</b>	2	2	2	2	3	2
CO 5	1	2	1	3	3	1

\*3 – Advanced Application; 2 – Intermediate Development; 1 - Introductory Level

#### LESSON PLAN

	List of Programs	Hrs	Pedagogy
1	Displaying "Welcome to Android Laboratory"		
2	Create an application that takes the name from a text box and shows		
	hello message along with the name entered in text box, when the user		
3	clicks the OK button		
	Different ways of handling button		
4	Create simple and effective Login form on Android		
5	Create registration form in android		
6	Single level & Multi level inheritance	30	РРТ
7	Design a simple User Interface layout		
8	Develop simple toast		
9	Build android app using Widget		
10	Develop Calculator Android application		
11	Implement the notification concept in Android		
12	Implement the notification concept in Android		
13	Create Simple Browser		

# Course Designed by: Mrs.R.Vasuki & Mrs G.Mahalakshmi Assistant Professor