B.Sc (Computer Science)

Syllabus

Program Code: UCS

2021-2022 onwards



MANNAR THIRUMALAI NAICKER COLLEGE

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

Eligibility for Admission

Candidates seeking admission to the B.Sc Degree course must have the Higher Secondary Education, (should have studied Computer Science and Mathematics in HSC) of the Government of Tamil Nadu or any other state or its equivalent qualification.

Duration of the course

:

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

Subjects of Study

Part I : Tamil / 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 –A 4 x01= 04 Marks Four multiple choice questions (answer all) Part –B Three short answers questions (answer all) 3 x02= 06 Marks Part –C Two questions ('either or 'type) 2 x 05=10 Marks Part –D Two questions out of three 1 x 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	m 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**

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 empower students of Computer Science Department to be technologically adept, innovative, self-motivated and responsible global citizens possessing human values and enable them to contribute in industrial development innovation, high quality technical education and research with the ever-changing world.

Mission

- To provide a strong theoretical and practical background across the computer science discipline with an emphasis on software development
- To achieve excellence in the field of computing through quality education and equip the skills in computer science that they need to take up real-world challenges
- To strengthen the Industry-Academia interface that will help the graduates to emerge as leaders in academics or an inspiring revolutionary in entrepreneurship.
- To evolve as a center of excellence in the field of Computer Science for developing technically competent professional with ethical values to serve the needs of industry and society

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
1	Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	knowledge base
2	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
4	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.	Design
10	An ability to apply professional ethics, accountability, and equity.	Ethics and equity
3	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
9	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.	Impact of engineering on society and the environment

6	An ability to work effectively as a member and leader in teams,	Individual
0	preferably in a multi-disciplinary setting.	and
		teamwork
8	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
12	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	Life-long learning
5	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.	Use of engineering tools
7	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 ion skills
	An ability to appropriately incorporate economics and business	Economics
11	practices including project, risk, and change management into the	and project
	practice of engineering and to understand their limitations.	management

PROGE	PROGRAM EDUCATIONAL OBJECTIVES (PEOs)			
PEO1:	Graduates of the programme will be employed in the field Computer Science.			
PEO2:	Graduates of the programme will pursue higher studies.			
PEO3:	GraduatesoftheprogrammewillapplynewtechnologiesinComputerSciencetoserve the needs of industry and society.			
PEO4:	$Graduates of program mewill have successful career interchnology in Computer {\tt Science}.$			
PEO5:	Graduates of the program mewill have skills to develop applications with innovation the state of the state			
PEO6 :	Graduates of the programme will have capable of working in multi-disciplinary environment following ethical values.			

PO NO	PROGRAMME OUTCOMES (POs)	
At the end	l 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

PROGRAM SPECIFIC OUTCOME (PSOs) Students to have knowledge and expertise in at least one procedure-oriented and object Oriented programming language

PSO1.	Students to have knowledge and expertise in at least one procedure oriented and object
1501.	Oriented programming language
DSO2.	Students to have wide perspective on software development including web based
F502.	Applications as well as graphic applications.
DSU3.	Students will be aware of the design principles of Operating Systems specializing on at
1505.	Least one popular operating System
PSO4.	Students to have the ability to design and implement to optimal databases using current
1504.	technologies.
PSO5:	Students design algorithms as per need by relating the data structure
DSO6	Students identify and describe the communication networks technologies
F300 :	In local area networks and the internet and countermeasures for security threats.

Bloom's Taxonomy



MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous), MADURAI COMPUTER SCIENCE CURRICULUM

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

Course Code	Title of the Course	Hrs	Credits	Maximum Marks		Marks	
				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						
21UCSC11	Programming in C	5	5	25	75	100	
21UCSCP1	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						
21UCSSP1	Office Automation 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	ГER			-		
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						
21UCSC21	Object Oriented Programming using C++	5	5	25	75	100	
21UCSCP2	Object Oriented Programming 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						
21UCSSP2	Multimedia Lab	2	2	40	60	100	
21UVLG21	Value Education	2	2	25	75	100	
	Total	30	23	205	495	700	

	THIRD SEMESTER							
Part – I	Tamil / Alternative Course							
21UTAG31	காப்பிய இலக்கியமும் உரைநடையும்	6	3	25	75	100		
Part – II	English							
21UENG31	Communicative English -III	6	3	25	75	100		
Part - III	Core Courses							
21UCSC31	Data Structures And Algorithms	5	5	25	75	100		
21UCSCP3	Data Structures And Algorithms Lab	4	4	40	60	100		
Part III	Allied Course							
21UMCA31	Numerical Aptitude	5	4	25	75	100		
Part IV	Skill Based Course							
21UCSSP3	Web Design Lab	2	2	40	60	100		
Part IV	Non Major Elective Course							
21UCSN31	Multimedia Technologies	2	2	25	75	100		
	Total	30	23	205	495	700		
	FOURTH SEMESTER							
Part – I	Tamil / Alternative Course							
21UTAG41	பண்டைய இலக்கியமும் புதினமும்	6	3	25	75	100		
Part – II	English							
21UENG41	Communicative English -IV	6	3	25	75	100		
Part - III	Core Courses							
21UCSC41	Relational Data Base Management System	5	4	25	75	100		
21UCSCP4	Relational Data Base Management System Lab	4	4	40	60	100		
Part III	Allied Course							
21UMCA41	Operations Research	5	4	25	75	100		
Part IV	Skill Based Course							
21UCSSP4	Programming in PHP Lab	2	2	40	60	100		
Part IV	Non Major Elective Course							
21UCSN41	Web Development	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 SEMEST	ER					
Part - III	Core Courses						
21UCSC51	Advanced Java Programming	6	4	25	75	100	
2111CSC52	Data Communication and	6	Δ	25	75	100	
21005052	Networking	0	-	25	15	100	
21UCSCP5	Java Programming Lab	6	4	40	60	100	
Part III	Core Elective Course I						
21UCSE51	Operating System Concepts						
21UCSE52	Software Engineering	5	5	25	75	100	
21UCSE53	Object Oriented Analysis and Design						
Part III	Core Elective Course II						
21UCSE54	Cyber Security						
21UCSE55	Internet of Things	5	5	25	75	100	
21UCSE56	Data Mining Techniques						
Part IV	Skill Based Course						
21UCSSP5	R Programming Lab	2	2	40	60	100	
	Total	30	24	180	420	600	
	SIXTH SEMEST	ER				_	
Part - III	Core Courses						
21UCSC61	C# and .Net Programming	6	4	25	75	100	
21UCSCP6	C# and .Net Programming Lab	6	4	40	60	100	
21UCSPR1	Project and Viva Voce	6	4	40	60	100	
Part III	Core Elective Course I						
21UCSE61	Cloud Infrastructure and Services						
21UCSE62	Machine Learning	5	5	25	75	100	
21UCSE63	Software Testing and Quality						
	Assurance						
Part III	Core Elective Course II						
21UCSE64	Big Data Analytics	-	_			100	
21UCSE65	Open Source Technologies	5	5	25	75	100	
21UCSE66	Client Server Computing						
Part IV	Skill Based Course						
21UCSSP6	Python 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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	PROGRAMMING IN O	2						
Course Code	21UCSC11					L	Р	С
Category	Core					5	-	5
Nature of cours	se: EMPLOYABILITY	-	SKILL ORIENTED	✓	ENTRE	PREN	EUR	SHIP
Course objectiv	/es:							
• To introduc	e the concepts of comp	uter	basics & programming	wit	h particu	lar a	ttenti	on to
• To learn th	e fundamental programn	ning	concepts and methodol	ogie	s which	are e	ssent	ial to
building good C programs.								
To practice	the fundamental program	ming	g methodologies in the	Сри	ogrammi	ng lai	nguag	ge via
• To code do	speriences.	enta	well-structured robust c	omr	uter prog	ram u	sino	the C
programmin	g language.	in a	wen structured, 100ust e	սոր	ater prog		SIIIE	the C
To write reu	sable modules (collection	s of f	unctions).					
Unit: I Int	roduction :						15	Hours
Generation and C	lassification of Computer	s - I	Basic Organization of a C	Com	puter – N	umbe	r Sys	tem –
Binary – Decima Pseudo Code – F	I – Conversion – Problem lowchart	is. N	eed for Logical Analysis	anc	I I ninkin	g – A	Igori	thm –
Unit: II CF	rogramming Basics :						15	Hours
Problem Formulation – Problem Solving – Introduction to "C" Programming – Fundamentals –								
Structure of a "C	" Program – Compilation	and	Linking Processes – Con	stan	ts, Variab	oles –	Data	types
 Expressions U 	sing Operators in "C" – N	Aana	ging Input and Output C	pera	ations – I	Decisi	on M	laking
Init. III Ari	avs and Strings ·	/ing .	simple scientific and sta	listic	al Proble	ms.	15	Hours
Arrays – Initiali	$\frac{ays}{ation}$ – Declaration – O	ne D	Dimensional and Two Di	men	sional A	rays	- St	ring –
String Operation	s – String Arrays. Simple p	orogr	rams – Sorting – Searchin	g – 1	Matrix Op	peratio	ons	0
Unit: IV Fu	nctions and Pointers :						15	Hours
Function – Def	nition of function – Decla	aratio	on of function – Pass by	Val	ue – Pass	by R	efere	ence –
Recursion – Poi	aters – Definition – Initial	1Zat10	on – Pointers and Arrays	-Ex	ample Pr	oblem	IS.	Hours
Introduction – N	leed for Structure Data Ty	ne –	Structure Definition – St	ructi	ire Decla	ration		nours
Structure within	a Structure - Union – Pro	pe ogran	n Using Structures and U	nion	s – Storaș	ge Cla	sses	_
Pre-processor D	irectives	-				-		
			To	tal I	Lecture H	lours	75	Hours
Books for Stud								
1. Anita Goel Pearson Noid	& Ajay Mittal, COMPU a 2017	TER	FUNDAMENTALS AN	ID I	PROGRA	MMI	NG	in C,
Unit I : Chapter	1 and 2,							
Unit II : Chapter	2,3,4,and 5,							
Unit III : Chapter	6 and 7,							
Unit IV : Chapter	6 and 8							

Unit	V Chapter9 and 10				
Boo	k for References:				
1. 2.	E.Balagurusamy, Programming in ANSI C, Tata McGraw Hill Education Private I Edition, New Delhi, 2012 Yashayant Kanetkar, Let Us C, BPB Publications, New Delhi, Tenth Edition, 2010.	limited, Sixth			
3.	Byron Gottfried, Programming with C, McGraw Hill Education (India) Private I Delhi, Third Edition, 2014. Brain W Kernigham & Dennis Ritchie, C Programming, Prentice Hall, Second Editic	Limited, New			
T. We	brain Witternighain & Dennis Kiterne, C Programming, Prentice Plan, Second Editor	<i>л</i> , 1700			
1. 1 2. 1 3. 1	nttps://www.slideshare.net/AjitNayak20/computer-fundamentals-intro-to-c-prog nodule-i nttps://www.slideshare.net/avikdhupar/amazing-c nttps://www.guru99.com/c-programming-tutorial.html	gramming-			
COURSE OUTCOMES: At the end of the course the students will be able to K Level					
СО	1 Use the concepts for solving scientific and mathematical problems	K3			
СО	2 Demonstrate an understanding of computer programming language concepts.	K3			
со	Design and develop computer programs, analyses and interprets the concept of pointers, declarations, initialization, operations on pointers and their implementations.	K3			
со	4 Define data types, use them in simple data processing applications and able to describe the concept of array of structures	K4			
CO	5 Relate the concepts of programming and develop confidence to learn the C language for life time	K4			

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	3	3	2	2	2
CO 2	2	2	3	2	3	1
CO 3	2	2	3	3	3	3
CO 4	2	2	3	3	3	2
CO5	3	2	2	3	3	3

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

LESSON PLAN

UNIT	SUBJECT NAME	Hrs	Mode
Ι	Generation and Classification of Computers - Basic Organization of a	15	Chalk &
	Computer - Number System - Binary - Decimal - Conversion -		Talk, ICT
	Problems. Need for Logical Analysis and Thinking - Algorithm -		Kit
	Pseudo Code – Flowchart		
II	Problem Formulation - Problem Solving - Introduction to "C"	15	Chalk &
	Programming – Fundamentals – Structure of a "C" Program –		Talk, ICT
	Compilation and Linking Processes – Constants, Variables – Data types		Kit
	- Expressions Using Operators in "C" - Managing Input and Output		
	Operations – Decision Making and Branching – Looping statements –		
	Solving Simple Scientific and Statistical Problems.		
III	Arrays - Initialization - Declaration - One Dimensional and Two	15	Chalk &
	Dimensional Arrays - String - String Operations - String Arrays.		Talk, ICT
	Simple programs – Sorting – Searching – Matrix Operations.		Kit
IV	Function – Definition of function – Declaration of function – Pass by	15	Chalk &
	Value - Pass by Reference - Recursion - Pointers - Definition -		Talk, ICT
	Initialization – Pointers and Arrays – Example Problems.		Kit
V	Introduction - Need for Structure Data Type - Structure Definition -	15	Chalk &
	Structure Declaration – Structure within a Structure - Union – Program		Talk, ICT
	Using Structures and Unions - Storage Classes - Pre-processor		Kit
	Directives		

Course Designed by: Mrs. S. Amutha & Dr.G.Devika

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	Section	
Internal	Cos	K Level	MCQ)s	Short Ans	swers	С	D	
	005		No. of. Questions	K - Level	No. of. Questions	K – Level	Either or Choice	Open Choice	
CI	CO1	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AII	CO4	Up to 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 &	Quea	No. of stions to be nswered	4		3		2	1	
Π	Mar	ks for each uestion	1		2		5	10	
	Tota eac	l Marks for th 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)	Consolida te of %			
	K1	2	2	-	-	4	8	20			
	K2	2	4	-	-	6	12	20			
CI	K3	-	-	20	20	40	80	80			
Α	K4	-	-	-	-	-					
Ι	Marks	4	6	20	20	50	100	100			
	K1	2	2	-	-	4	8	20			
CI	K2	2	4	-	-	6	12	20			
	K3	-	-	10	10	20	40	40			
	K4	-	-	10	10	20	40	40			
ш	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)								
			MCC)s	Short A	nswers	Section C		
S.No	COs K - Level		No. of Questions	K – Level	No. of Questio ns	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 Askee	ons 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 parenthe	esis denotes, q	uestions s	hould be a	sked with	the given K	level)	

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

		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		
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 (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 (Sho	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)
Answe	r All Q	uestions	(5 x 5 = 25 marks)
Q.No	CO	K Level	Questions
16) a	COI	K3,K3	
16) b	COI	K3,K3	
1/) a	CO2	K3,K3	
1/) b	CO2	K3,K3	
18) a	CO3	K3,K3	
18) b	CO3	K3,K3	
19) a	CO4	K4,K4	
19) b	C04	K4,K4	
20) a	C05	K4,K4	
20) D		K4,K4	armanaa of the students is to be assessed by attempting hiskor
ND: HI	gner ie W lovo	ver of perio	ormance of the students is to be assessed by attempting mgner
Section	\mathbf{N} leve	an Choice	
Answor	r Any T	Chron quos) tions (3v10-30 morks)
		K I ovol	Ouestions
21	CO1	K3	<u>Yutsuons</u>
22	CO^{1}	K3	
23	CO3	K3	
23	CO4	K4	
25	CO5	K4	
25	005	TZI	1

Summative Examinations - Question Paper – Format



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

Course Nam	e PR	ROGRAMMING IN C LA	AB					
Course Code	21	UCSCP1			L	Р	С	
Category	Co	ore			-	4	4	
Nature of co	urse:	EMPLOYABILITY	SKILL ORIENTED	✓ ENTREP	RENEU	JRSH	IP	
Course objectives:								
• To develop the basic knowledge of programming fundamentals of C language.								
• To apply the technique to solve problems through decision-making and looping statements.								
• To explai	n the a	rrays concepts.						
• To impart	t the co	oncepts like functions, poin	ters, structure.					
• To experi	ment v	with file handling concepts.						
S. No.		L	ist of Programs			H	lours	
1.	Write	a C program to find the ro	ots of a Quadratic equat	tion.				
2.	Write	a C program to find the Ad	dition and Multiplication	on of Matrices	using			
3.	arrays	5.						
	Write	a C program to generate P	ascal's triangle.					
4.	Write	a C program to manipulate	e string in build function	ns.				
5.	Write	a C program to using recur	rsion for swapping of tv	vo integers.				
6.	6. Write a C program to find given string is Palindrome or not.							
7.	Write	a C program to find given	number is Prime or not					
8.	8. Write a C program to display student details like Register number, Name,							
<i>9</i> .	Marks	s, DOB, Aadhar number, N	lobile using structure.	• , ,				
10.	Write	a C program to display em	ployee salary payroll us	sing structure.				
11.	Write	a C program to maintain a	n inventory of items in (online store.			60	
12.	Write	a C program using Pointe	IS.				00	
13.	Write	C programs for time relate	d functions					
14.	Write	programs using C Preproc	essor Directives					
15.	Write	a program to open write (close the text file using	files handling (~			
10.	nrogra	am	close the text me using	mes nanomig	C			
17.	Write	a C Program to implement	error handling.					
18.	Write	a C program to read name	and marks of n number	of students an	d store			
	them i	in a file.						
19.	Write	a C program which copies	one file to another file	using file hand	ling.			
20.	Write	a C program to merge two	files into a third file (i.e	e., the contents	of the			
	first fi	ile followed by those of the	e second are put in the th	nird file).				
<u> </u>				Total I	Iours		60	
Web Resour	ces:							
https://www	.progr	amiz.com/c-programming	Į.					
https://www	.tutor	ialspoint.com/cprogramm	ing/index.htm					
https://www	.w3scl	hools.in/c-tutorial/						

https://www.programiz.com/c-programming https://www.guru99.com/c-programming-tutorial.html https://www.programiz.com/c-programming/c-file-examples https://fresh2refresh.com/c-programming/c-file-handling/

COURSE OUTCOMES: At the end of the course the students will be able to					
CO1	Develop solutions to simple computational problems using C programs.	K3			
CO2	Solve problems using conditionals and loops in C.	K3			
CO3	Understand the concepts of Arrays and structure	K2			
CO4	Develop C programs by defining functions and pointers	К3			
CO5	Develop C programs using files.	K3			

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	3	2	2	3
CO 2	2	3	3	3	3	3
CO 3	2	2	2	3	2	3
CO 4	3	2	2	3	2	2
CO5	2	3	2	2	2	2

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

LESSON PLAN

S. No.	List of Programs	Hrs	Mode
1.	Write a C program to find the roots of a Quadratic equation.		
2.	Write a C program to find the Addition and Multiplication of		
3.	Matrices using arrays.		
	Write a C program to generate Pascal's triangle.		
4.	Write a C program to manipulate string in build functions.		
5.	Write a C program to using recursion for swapping of two		
6.	integers.		
7.	Write a C program to find given string is Palindrome or not.		
8.	Write a C program to find given number is Prime or not		
9.	Write a C program to display student details like Register		
10.	number, Name, Marks, DOB, Aadhar number, Mobile using		
11.	structure.		
12.	Write a C program to display employee salary payroll using		Black Board,
13.	structure.		Lab
14.	Write a C program to maintain an inventory of items in online	60	Demonstration
15.	store.	00	
16.	.Write a C program using Pointers.		
	Write a C program using Union concepts		Projector.
17.	Write C programs for time related functions.		
18.	Write programs using C Preprocessor Directives.		
	Write a program to open, write, close the text file using files		
19.	handling C program.		
20.	Write a C Program to implement error handling.		
	Write a C program to read name and marks of n number of		
	students and store them in a file.		
	Write a C program which copies one file to another file using		
	file handling.		
	Write a C program to merge two files into a third file (i.e., the		
	contents of the first file followed by those of the second are put		
	in the third file).		

Course Designed by: Mr. S.R. Mathu Sudhanan & Mrs. S.Amutha



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

Course Name	Mathematical Foundations						
Course Code	21UMCA11	L	Р	С			
Category	Allied	5	-	4			
Nature of course	: EMPLOYABILITY 🗸 SKILL ORIENTED 🖌 ENTREPRENE	URS	HIP	✓			
Course Object	ives:						
• To understa	and the rank of a matrix and apply it to solving system of linear equation	ons.					
• To analyze	Eigen values and associated Eigen vectors of a matrix.						
• To study th	e methods of reasoning, which includes algebra of propositions, such	as co	ompo	und			
proposition	s, truth tables, and tautologies						
• To write an	d interpret mathematical notation and mathematical definitions						
• To acquire	a basic idea of graph, various terms associated and matrix representation	ions o	f gra	phs,			
Trees and t	heir properties		- <u>r</u>				
Unit: I Ma	trix Algebra		15				
Introduction - N	Aatrix operations – Inverse of a Square Matrix – Elementary operation	ns and	Ran	k of			
a Matrix – Sim	ultaneous Linear Equations.						
Unit: II Ma	trix Algebra		15				
Inverse by Part	itioning – Eigen values and Eigen vectors(Problems only)		<u> </u>				
Unit: III Lo	gic		15				
Introduction - TF-statements - Connectives - Atomic and compound statements - Well Formed							
(Statement) Fo	rmulae – Truth table of a Formula – Tautology – Tautological Im	plicat	ions	and			
Equivalence of	Equivalence of Formulae						
Unit: IV La	ttices and Boolean Algebra	•	15				
Lattices – Som	e properties of Lattices – New Lattices – Modular and Distributive La	ttices					
– Boolean Alge	bras – Boolean Polynomials – Karnaugh Graphs (Problems only).		1.5				
Unit: V Gr	aph Theory	(D (15				
Basic concepts	– Matrix Representation of Graphs – Trees – Spanning Trees – Shorte	st Pat	h				
Problem (Probl	ems only).						
	Total Lecture Ho	urs	75 H	rs			
Books for Stuc	ly:						
Dr. M.K.	Venkataraman. N. Sridharan. and N. Chandrasekaran, "Discrete Ma	them	atics	",			
The National P	ublishing Company, Chennai, 2006.						
Unit I -	• Chapter 6: Pages : 6.1- 6.31						
Unit II -	• Chapter 6: Pages : 6.31- 6.44						
Unit III -	• Chapter 9: Pages : 9.1 – 9.34						
Unit IV -	· Chapter10: Pages :10.1 – 10.70						
Unit V -	· Chapter11: Pages : 11.1 – 11.81						
Books for Refe	erences:						
1. Trembley.	J.P. and Manohar.R., 2001, Discrete Mathematical Structures with A	pplic	ation	s to			
Compute Scier	ice, Tata McGraw –Hill Publishing Company Ltd, New Delhi.	1	•				
2. Seymour I	Lipschutz and Marc Lars Lipson, 2002, Discrete Mathematics, Tata	McC	iraw	Hıll			

Publis	shing Company Ltd. New Delhi.	
Web R	lesources:	
• <u>htt</u>	tps://nptel.ac.in/courses/106/106/106106094/	
• <u>htt</u>	ps://nptel.ac.in/courses/111/107/111107058/	
• htt	ps://nptel.ac.in/courses/111/106/111106086/	
• htt	ps://nptel.ac.in/noc/courses/noc18/SEM2/noc18-cs53/	
Course	e Outcomes	K Level
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,	K1
	vector analysis, cryptography, graph theory etc	KI
	apply the matrix theory to analyze the quantitative and qualitative properties	
CO2:	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	K3
CO4:	Formulate and interpret Boolean logic principles.	K 3
CO5:	have a strong background of graph theory	K3

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	3	2	3	0
CO 2	2	3	3	3	2	0
CO 3	3	2	2	2	3	0
CO 4	3	2	2	3	3	0
CO5	3	2	3	3	3	0

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

LESSON PLAN

UNIT	SUBJECT NAME	Hrs	Mode
Ι	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)										
		11		Section	n A	Section	B	Section	Section	
Inte rnal	C	16	K Level	MCC	Qs	Short Answers		С	D	
			K Level	No. of. Questions	K - Level	No. of. Questions	K – Level	Either or Choice	Open Choice	
CI	CC)1	Up to K3	2	K1,K2	1	K1	2 (K2)	1 K3	
AI	CO2		Up to K4	2	K1,K2	2	K2	2(K3&K 3)	1 (K4)	
CI	CC)3	Up to K4	2	K1,K2	1	K1	2 (K2)	1 (K3)	
AII	CO4		Up to K4	2	K1,K2	2	K2	2 (K3)	1 (K4)	
		Q	No. of uestions to be asked	4		3		4	2	
Question Pattern CIA I & II	tion ern	No. of Questions to be answered		4		3		2	1	
	1 & [Ma	rks for each question	1		2		5	10	
		T	otal 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)	Consol idate of %	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10	-	16	32	40	
	K3	-	-	10	10	10	20	40	
CI	K4	-	-	-	10	10	10	20	
ΑI	K5	-	-	-		-	-	-	
	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	-	4	8	40	
	K2	2	4	10	-	16	32	40	
CI	K3	-	-	10	10	10	20	40	
Α	K4	-	-	-	10	10	10	20	
Π	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

Summative Examination – Blue Print Articulation Mapping – K Level with Course										
	Outcomes (COs)									
		V	MC	Qs	Short An	swers	Section C	Section		
S.No	COs	N - Lovol	No. of	K –	No. of	K –	(Either / or	D (Open		
		Level	Questions	Level	Question	Level	Choice)	Choice)		
1	CO1	K1	2	K1	1	K2	2 (K3& K3)	1 (K3)		
2	CO2	K3	2	K1	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		ons to be	10		5		5	5		
Asked			10		5		5	3		
No.o	of Questio	ns to be	10		5		5	3		
answered		10		5		5	3			
Marks for each question		1		2		5	10			
Total Marks for each		10		10		25	30			
	section	1	10		10		23	30		
	(Figures	in parentl	nesis denotes	, questions	should be as	sked with	n the given K le	evel)		

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.**

K LevelSection A (Multiple Questions)Section B (Short Answer Questions)Section C (Either/ or Choice)Section D (Open Choice)Total (Marks Marks% of (Marks without choice)K15610-1915.8342K25410103125.8342K320305041.6742	lated								
K1 5 6 10 - 19 15.83 42 K2 5 4 10 10 31 25.83 42 K3 - - 20 30 50 41.67 42									
K2 5 4 10 10 31 25.83 42 K3 - - 20 30 50 41.67 42									
K3 20 30 50 41.67 42									
K4 10 10 20 16.67 16									
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	ı 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	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	rs)
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	COI	KI K1	
16) b	COI	KI K1	
1/) a	CO2	KI K1	
1/)b	CO_2	KI K2	
18) a	CO3	K3 K2	
18) b	CO_3	K3	
19) a	CO4	K3 K2	
19) D	CO4	K3 K2	
20) a	C05	K3 K2	
20) D	<u> </u>	<u> </u>	
NB: HI	gner le	vel of peri	ormance of the students is to be assessed by attempting higher
Section	\mathbf{N} leve	an Chaice	
Answei	r Anv T	Chron quos	tions (3v10-30 morks)
		K Lovol	Ouestions
21	C01	K1	<u>Yutsuons</u>
21	CO^{2}	K1	
23	CO3	K3	
23	CO4	K3	
25	CO^{-}	K3	
45	005	11.5	

Summative Examinations - Question Paper – Format



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

Course Name	OFFICE AUTOMATION LAB							
Course Code	e 21UCSSP1 L P							
Category	Skill -	2	2					
Nature of cours	e: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPREN	EUR	SHIP					
Course objectiv	es:							
 To familiautomatic To make To educa To train t To make S. No. 	tarize the students in preparation of documents and presentations with offic on tool aware of Office automation using MS-Office the MS-office system, internet operations, online, offline working areas them to work on the comment based activities in MS-office system the participants to understand various services based on online and offline List of Programs	e surfa	aces Iours					
1. Te 2. Us 3. Us 4. Pia 5. Cr 6. Cr 7. Mi 8. Co 9. Cr 10. Sp Do Mi 11. Cr 12. Al 13. Ex 14. Cr 15. Mi 16. Fo 17. Dr 18. Cr 19. Cr 20. Co Mi 21. W 22. Cr 23 Ch 24	S-WORD ext Manipulations and Text Formatting sage of Numbering, Bullets, Tools and Headers sage of Spell Check and Find and Replace cture Insertion and Alignment eation of Documents Using Templates eation of Templates ail Merge Concept opying Text and Picture from Excel eation of Tables, Formatting Tables ditting the Screen and Opening Multiple Document, Inserting Symbols in ocuments S-EXCEL eation of Worksheet and Entering Information igning , Editing Data in Cell ccel Function (Date , Time, Statistical, Mathematical, Financial Functions) nanging of Column Width and Row Height (Column and Range of Column oving, copying, Inserting and Deleting Rows and Columns rmatting Numbers and Other Numeric Formats rawing Borders around Cells eation of Charts Raising Moving nanging Chart Type ontrolling the Appearance of a Chart S-POWER POINT – orking with slides eating, saving, closing presentation nanging slide layout orking font and bullets)	10					

25.	Inserting Clipart	
26.	Working with Clipart	
27.	Applying Transition and animation effects	
28.	Add audio file to the slide.	
30	Run and Slide Show	
	Total Lecture Hours	30

Course	Course Outcomes					
On the	successful completion of the course, the students will be able to					
CO1:	Acquire knowledge on editor, spreadsheet and presentation software	K2				
CO2:	Understand and discuss about the use of Office Package in daily life	K2				
CO3.	Give hands on training to the students to create and format documents using	V A				
005:	MSWord	N 4				
CO4:	Construct charts in MS-Excel	K3				
CO5:	Design presentation with efficient slides	K4				

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	3	2	2	2	3
CO 2	3	2	2	2	1	1
CO 3	3	3	3	2	2	2
CO 4	2	2	2	3	2	2
CO5	2	2	3	2	3	2

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

LESSONPLAN

S. No.	List of Programs	Hrs	Mode
	MS-WORD		
1.	Text Manipulations and Text Formatting		
2.	Usage of Numbering, Bullets, Tools and Headers		
3.	Usage of Spell Check and Find and Replace		
4.	Picture Insertion and Alignment		
5.	Creation of Documents Using Templates		
6.	Creation of Templates		
7.	Mail Merge Concept		
8.	Copying Text and Picture from Excel		
9.	Creation of Tables, Formatting Tables		
10.	Splitting the Screen and Opening Multiple Document, Inserting		
	Symbols in Documents		
	MS-EXCEL		
11.	Creation of Worksheet and Entering Information		
12.	Aligning, Editing Data in Cell		
13.	Excel Function (Date, Time, Statistical, Mathematical, Financial		
	Functions)		
14.	Changing of Column Width and Row Height (Column and Range of	20	Lab
	Column)	30	demonstration
15.	Moving, copying, Inserting and Deleting Rows and Columns		
16.	Formatting Numbers and Other Numeric Formats		
17.	Drawing Borders around Cells		
18.	Creation of Charts Raising Moving		
19.	Changing Chart Type		
20.	Controlling the Appearance of a Chart		
	MS-POWER POINT –		
21.	Working with slides		
22.	Creating, saving, closing presentation		
23	Changing slide layout		
24.	Working fonts and bullets		
25.	Inserting Clipart		
26.	Working with Clipart		
27.	Applying Transition and animation effects		
28.	Add audio file to the slide.		
30	Run and Slide Show		

Course Designed by: Mrs. T.C. Sujitha & Mr. S. Veerapandi



Academic Council Meeting Held On 29.04.2021



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

Course Name	OBJECT ORIENTED PROGRAMMING USING C++							
Course Code	21UCSC21				L	Р	С	
Category	Core				5	-	5	
Nature of cours	se: EMPLOYABILITY	×	SKILLORIENTED	✓ ENTREP	RENE	URSI	HIP	
Course objectiv	es:							
 To provide e To practice t via laborator To write C+- To learn the To code, doo C/C++ program 	 To provide exposure to problem solving through programming To practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences. To write C++ programs using decision making, branching, looping constructs To learn the syntax and semantics of the C++ programming language. To code, document, test, and implement a well-structured, robust computer program using the 							
Unit· I Pri	ncinles of Object Oriente	d Proc	pramming ·			1	15	
Basic concepts of Object-Oriented Programming-Benefits of OOP- Object – Oriented Languages –Applications of OOP Beginning with C++: What is C++? – Applications of C++ - A simple C++ Program – Structure of C++ Program – Compiling and linking- Tokens, Expressions and Control Structures: Tokens –Keywords –Identifiers and Constants - Basic Data Types – User Defined Data Types –Derived Data Types–Operators in C++-Scope Resolution Operator–Member Dereferencing Operator–Manipulators–Special Assignment Expressions –Control Structures15Unit: IIFunctions in C++:15The Main Function – Function Prototyping – Call By Reference – Return By Reference – Inline Functions – Default Arguments –Recursion-Function Overloading – Friend and Virtual Functions– Math Library Functions Classes and Objects: Specifying a Class–Defining Member Functions – C ++ Program with Class – Making an Outside Function Inline – Nesting of Member Functions – Memory Allocation for Objects–Static Data Members – Static Member Functions–Arrays of								
Unit: III Op	erator Overloading and [Гуре С	Conversions:			1	15	
Defining Opera Rules for opera Classes–Single Multiple Inherit Classes Unit: IV Basics of Exc Catching Mech	tor Overloading – Overloa tor Overloading Inheritant Inheritance–Making a P ance –Hierarchical Inherit ception Handling: eption Handling–Exception anism Manipulating Strin	ding U ce : Ex rivate ance-H on Ha gs: Int	Inary Operators – Over Atending Classes: Intr Member Inheritable Hybrid Inheritance–Vi ndling Mechanism roduction–Creating(s	erloading Bina oduction –De – Multilevel rtual Base Cla – Throwing tring) Objects	ary O _I fining Inhe asses– Mech s–Mar	perato g Der ritano - Abs - Abs Abs 	ors – rived ce – stract 15 m – ating	
String Objects-Relational Operations-String Characteristics-Accessing Characters in Strings-								
Unit: V Poi	nters, Virtual Functions	and P	olymorphism:			1	15	
Pointers – this I Files: Classes f More about O	Pointer –Polymorphism – V or File Stream Operations pen() : File Modes – Seq	Virtual – Oper	Functions – Pure Vir ning and Closing a Fi I Input and Output (tual Functions ile –Detecting Operations –C	s Wor End- Comm	king of F and–	with File – Line	

Arguments

Total Lecture Hours 75

Books for Study:

1.E.Balagurusamy, Object–Oriented Programming with C++, McGraw Hill Education (India)Private Limited, Chennai,7e Unit: I Chapter 1-Sections1.5-1.8 Chapter 2-Sections2.1-2.3,2.6,2.8 Chapter 3- Sections 3.1, 3.6, 3.8, 3.14-3.16, 3.18, 3.21, 3.25 Unit: II Chapter 4– Sections4.2–4.7,4.9-4.12 Chapter 5 - Sections 5.3 - 5.13, 6.2, 6.3, 6.11 Unit: III Chapter 7–Sections 7.2–7.4 Chapter 8 – Sections 8.1 -8.11 Unit: IV Chapter 13-Sections13.2-13.5 Chapter 15 – Sections 15.1 - 5.7 Unit: V Chapter 9– Sections 9.2,9.4,9.5,9.7,9.8 Chapter 11–Sections11.2-11.5,11.7,11.10 **Books for Reference:** D.Ravichandran, "Programming with C++" Tata McGraw Hill, Third Edition ,2012 1. 2. Robert Lafore, "Object Oriented Programming with C++". 3. GalgotiaPublicationsPvtLtd.,FourthEdition,2002. Herbert Schildt, "C++ The Complete Reference", Tata McGraw Hill, FourthEdition, 2006 4. Web Resources:

- 1. https://www.programiz.com/cpp-programming
- 2. <u>https://www.javatpoint.com/cpp-tutorial</u>

Course	Outcome	K Level
CO1:	Learn the fundamental programming concepts and methodologies which are essential to building good C++ programs	К3
CO2:	Code, document, test, and implement a well-structured, robust computer program using the C++ programming language	К3
CO3:	Describe the object-oriented programming approach in connection with C++	K3
CO4:	Understand concepts like inheritance, polymorphism, pointers and virtual functions	K4
CO5:	Demonstrate the need of files and their operations	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	1	1	2
CO 2	2	2	2	2	2	2
CO 3	1	1	2	1	2	1
CO 4	3	2	1	2	1	2
CO5	2	1	2	2	3	1

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

LESSON PLAN

UNIT	Object Oriented Programming Using C++	Hrs	Mode
I	Principles of Object Oriented Programming-Beginning with C++: Tokens, Expressions and Control Structures-Operators in C++ - Control Structures	15	Chalk and Talk , ICT Tools
II	Function in C++–Recursion- Function Overloading- Classes and Objects- Arrays of Objects Constructors and Destructors: Constructors –Parameterized Constructors–Destructors	15	Chalk and Talk , ICT Tools
III	OperatorOverloadingandTypeConversions- Inheritance:ExtendingClasses –Virtual Base Classes–Abstract Classes	15	Chalk and Talk , ICT Tools
IV	Exception Handling-Manipulating Strings	15	Chalk and Talk , ICT Tools
v	Pointers, Virtual Functions and Polymorphism -Working with Files – File Modes–Sequential Input and Output Operations– Command–Line Arguments	15	Chalk and Talk , ICT Tools

Course Designed by: Mrs. R. Vaitheswari & Dr. G. Devika

Learning Outcome Based Education & Assessment (LOBE)									
Formative Examination - Blue Print									
Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section	n A	Section	Section B		Section	
Internal	Cos	K Level	MCC)s	Short Ans	swers	С	D	
mernar	005	K Level	No. of. Questions	K - Level	No. of. Questions	K – Level	Either or Choice	Open Choice	
CI	CO1	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AII	CO4	Up to 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 eac	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	
СТА	K3	-	-	20	20	40	80	80	
	K4	-	-	-	-	-			
•	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	-	4	8	20	
	K2	2	4	-	_	6	12	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	MCC No. of Questions)s K – Level	Short A No. of Questio ns	nswers 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 Questi Askee	ons to be d	10		5		10	5	
No.of Questions to be answered		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	in parenthe	esis denotes, q	uestions s	hould be a	sked 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	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 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)				
Answe	r All Q	uestions	(5 x 5 = 25 marks)				
Q.No	CO	K Level	Questions				
16) a	COI	K3,K3					
16) b	COI	K3,K3					
1/) a	CO2	K3,K3					
1/) b	CO2	K3,K3					
18) a	CO3	K3,K3					
18) b	CO3	K3,K3					
19) a	CO4	K4,K4					
19) b	C04	K4,K4					
20) a	C05	K4,K4					
20) D		K4,K4	armanaa of the students is to be assessed by attempting hiskor				
ND: HI	gner ie W lovo	ver of perio	ormance of the students is to be assessed by attempting mgner				
Section	\mathbf{N} leve	an Choice					
Answor	r Any T	Chron quos) tions (3v10-30 morks)				
		K I ovol	Ouestions				
21	CO1	K3	<u>Yutsuons</u>				
22	CO^{1}	K3					
23	CO3	K3					
23	CO4	K4					
25	CO5	K4					
25	005	TZI	1				

Summative Examinations - Question Paper – Format



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

Course Nam				
Course Cod	e 21UCSCP2	L	Р	С
Category	Core	-	4	4
Nature of co	PRENE	URS	HIP	
Course obje	ctives:			
To Enhar	nce programming skills of the students, using Object oriented program	ming co	oncer	ots.
To provid	de in-depth coverage of object-oriented programming principles and t	echniqu	ies.	
• To practi	ce the use of C++ classes and class libraries, arrays, vectors, inheritan	ce and f	ïle I/	0
stream co	oncepts.			
• To devel	op classes for simple applications and Execute well structured C++ pro-	ograms.		
• To use pr	roblem solving and program design to generate effective applications.	-		
S. No.	List of Programs	Η	ours	
1.	Simple Programs.			
2.	Program using control structures.			
3.	Program using one dimensional Array			
4.	Program using two dimensional Arrays.			
5.	Program using class and Objects.			
6.	Program using Structure and Union.			
7.	Program using Constructor and overloading constructor.			
8.	Program using Inheritance (Different forms).		60	
9.	Program using Function Overloading.			
10	Program using Operator Overloading.			
11.	Program using Pointer Arithmetic.			
12.	Program using Virtual Functions.			
13.	Program using Friend Function and Inline function.			
14.	Program using Exception Handling.			
15.	Program using Stream (File) Operations.			
	Total Lecture Hours		60	

Course	Outcome	K Level
CO1:	Learn how to design C++ classes for code reuse.	K1
CO2:	Examine the types of inheritance	K2
CO3:	Implement object oriented programming concepts in C++	К3
CO4:	Describe the concept of function overloading ,operator overloading, polymorphism	K4
CO5:	Apply the concepts of and principles of the programming language to the real– World problems and solve the problems	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	1	2	1	2	1
CO 2	1	1	2	2	3	3
CO 3	2	1	2	1	2	2
CO 4	3	2	2	1	2	2
CO5	1	2	2	2	2	3

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

LESSON PLAN

S. No	List of Programs	Hours	Mode
1.	Simple Programs.		
2.	Program using control structures.		
3.	Program using one dimensional Array		
4.	Program using two dimensional Arrays.		
5.	Program using class and Objects.		
6.	Program using Structure and Union.		
7.	Program using Constructor and overloading constructor.		. .
8.	Program using Inheritance (Different forms).	60	Lab
9.	Program using Function Overloading.		demonstration
10	Program using Operator Overloading.		
11.	Program using Pointer Arithmetic.		
12.	Program using Virtual Functions.		
13.	Program using Friend Function and Inline function.		
14.	Program using Exception Handling.		
15.	Program using Stream (File) Operations.		

Course Designed by: Mr.S.Veerapandi & Mrs. R.Vaitheswari



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

Course Name	e Probability and Statistics					
Course Code	21UMCA21			L	Р	С
Category	Allied			5	-	4
Nature of course:	EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENE	URSI	HP	✓
Course Objecti	ves:					
• To provide	students with the foundat	tions of probabilistic and	statistical analysis n	nostly	used	l in
varied appli	cations in engineering ar	nd science like disease me	odeling, climate prec	liction	n and	
To Apply la	works elc.	rata problems				
• TO Apply la	usures of Central Tenden				15	
Introduction – A	rithmetic mean – Partiti	on Values – Mode – Geo	metric Mean & Hari	nonic	15	'
Mean(problems	only)			nome		
Unit: II Mea	sures of Dispersion				15	
Introduction – N	leasures of dispersion(pi	coblems only)			1	
Unit: III Cor	relation and Regression	• /			15	
Introduction – C	orrelation - Rank Correl	lation – Regression				
Unit: IV Pro	oability	-			15	
Probability- Intr	oduction -Conditional Pr	robability – Mathematica	l Expectations (Prob	lems	only)	
Unit: V Spe	cial Distributions				15	
Introduction – B	inomial Distribution – P	oisson Distribution -Nor	mal Distribution.(Pr	oblen	ns on	ly)
			Total Lecture Ho	urs	75 H	rs
Books for Stud	y:					
Arumugam. S. Palayamkotai 2	and Thangapandi Isa	ac. A., "Statistics", N	New Gamma Publi	ishing	Но	use,
I uluyulinkotul, 2	Init I - Chapter	2: Sections : $2.0 - 2.4$				
Ľ	Init II - Chapter	3: Sections : 3.0 & 3.1(f)	ull)			
t	Init III - Chapter	6: Sections: 6.0-6.3	,			
τ	Init IV - Chapter	11: Sections: 11.0-11.2,				
C	hapter12 : Section: 12.4					
ι	Init V - Chapter	13: Sections: 13.0 – 13.3				
Books for Refe	rence:					
1. Vittal. P.R.,	Mathematical Statistic	s, Margham Publications	s, Chennai, 2013.			
2. Gupta. S.C.	and Kapoor. V.K., "Fun	idamentals of Mathema	tical Statistics", Ele	eventh	edit	ion,
Sultan Chan	d & sons, New Delhi, 20)07.		1	a 1	
3. Gupta. S.C.	and Kapoor. V.K., "Ele	ements of Mathematical	Statistics", Third E	dition	, Sul	tan
Chand & Sc	ns, Educational Publishe	ers, New Deini, 2015.				
https://pptol.co	in/courses/111/105/111	1050/11/				
https://mpter.ac	sscentral com/course/s	<u>105041/</u> wayam.nrohahility.an <i>i</i>	Letatistics-5228			
Course Outcon	IPS	may am-propagnity and	5.000000-5220	1	ζLe	vel
On the successfi	ll completion of the cour	rse, the students will be a	ble to		<u>.</u>	,
CO1: Improve	data handling skills and	summarize statistical co	mputations.		K3	,
			r			_

CO2:	Determine the relationship between quantitative variables and extend regression Analysis.	К3
CO3:	Recall and apply a comprehensive set of Probability ideas.	K1
CO4:	Find, interpret and analyze the measure of central tendencies, Moment Generating function and Characteristic function of random variables.	K3
CO5:	Relate, Analyze and Demonstrate the knowledge of using various distributions for statistical analysis.	K2

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	3	3	1
CO 2	3	3	3	3	2	1
CO 3	3	3	3	3	2	1
CO 4	3	2	2	3	3	1
CO5	3	2	3	3	3	1

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

LESSON PLAN

Unit	Course Name	Hrs	Pedagogy
Ι	Introduction –Measures of Central Tendencies(Proofs of the Theorems are not included – Problems only)	15	Chalk & Board
П	Introduction – Measures of Dispersion (Proofs of the Theorems are not included – Problems only)	15	Chalk & Board
Ш	Introduction – Correlation – Rank Correlation – Regression. Introduction-	15	Chalk & Board
IV	Probability- Conditional Probability – Mathematical Expectations (Proofs of the Theorems are not included – Problems only)	15	Chalk & Board
V	Introduction – Binomial Distribution – Poisson Distribution -Normal Distribution.(Proofs of the Theorems are not included – Problems only)	15	Chalk & Board

Course Designed by: Mrs. H. Sowmiyagowri

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section	n A	Section	ı B	Section C	Section	
Internal	Cos	K Level	MCQ)s	Short Ans	swers	Either or	D	
	Cut		No. of. Questions	K - Level	No. of. Questions	K – Level	Choice	Open Choice	
CI	CO	Up to K2	2	K1,K2	1	K1	2(K2&K2)	1 K2	
AI	CO	2 Up to K3	2	K1,K2	2	K2	2(K3&K3)	1 (K3)	
CI	CO.	3 Up to K3	2	K1,K2	1	K1	2(K2&K2)	1 (K2)	
AII	CO4	Up to K3	2	K1,K2	2	K2	2(K3&K3)	1 (K3)	
		No. of Questions to be asked	4		3		4	2	
Question Pattern		No. of Questions to be answered	4		3		2	1	
CIA I &	II	Marks for each question	larks 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	60		
	K2	2	4	10	10	26	52	00		
	K3	-	-	10	10	20	40	40		
CIA I	K4	-	-	-	-	-	-	-		
	K5	-	-	-		-	-	-		
	Marks	4	6	20	20	50	100	100		
	K1	2	2	-	-	4	8	60		
	K2	2	4	10	10	26	52	00		
СТА	K3	-	-	10	10	20	40	40		
	K4	-	-	-	-	-		-		
	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)			
		V	MC	Qs	Short Ar	swers	Section C	Section
S.No	COs	K - Lovol	No. of	K –	No. of	K –	(Either / or	D (Open
		Level	Questions	Level	Question	Level	Choice)	Choice)
1	CO 1	K1	2	K1&K2	1	K1	2 (K3&K3)	1 (K2)
2	CO 2	K3	2	K1&K2	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 Question	ons to be	10		5		5	5
	Asked	1	10		5		5	2
No.e	of Questic	ons to be	10		5		5	2
	answer	ed	10		5		5	3
Marks for each question		1		2		5	10	
Total Marks for each		10		10		25	30	
section		10		10		25	30	
	(Figuros	in noronth	osis donatos	questions	should be a	kod with	the given K k	avol)

(Figures in parentnesis 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	6	10	-	19	15.83	42				
K2	5	4	10	10	31	25.83					
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										
of K lev	els.		of K levels.								

Section	A (Mu	ltiple 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 (Sho	ort Answer	·s)
Answei	r All Q	uestions	(5x2=10 marks)
Q.No	<u>CO</u>	K Level	Questions
11	<u>COI</u>	Kl	
12	<u>CO2</u>	KI	
13	<u>CO3</u>	K2	
14	<u>CO4</u>	K2	
15	<u>CO5</u>	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	$\frac{\mathbf{r} \mathbf{A} \mathbf{I} \mathbf{Q}}{\mathbf{C} \mathbf{Q}}$	uestions	$(5 \times 5 = 25 \text{ marks})$
\mathbf{Q} .No	$\frac{CO}{CO1}$	K Level	Questions
10) a	$\frac{COI}{CO1}$	K3,K3	
10) 0	$\frac{CO1}{CO2}$	N3,N3	
$\frac{17}{a}$	$\frac{CO2}{CO2}$	K3,K3	
$\frac{17}{0}$	$\frac{CO2}{CO3}$	K3,K3 K2 K2	
10) a 18) b	$\frac{CO3}{CO3}$	K3,K3	
10) 0	$\frac{CO3}{CO4}$	K3,K3	
19)a 10)b	$\frac{CO4}{CO4}$	K4,K4	
$\frac{1}{20}$	$\frac{CO_{\pm}}{CO_{\pm}}$	K4,K4 K/ K/	
$\frac{200}{200}$ h	$\frac{CO3}{CO5}$	K4,K4 KA KA	
NR· Hi	oher le	vel of nerf	ormance of the students is to be assessed by attempting higher
level of	'K leve	ls	ormance of the students is to be assessed by attempting ingher
Section	D (On	en Choice	
Answei	r Anv J	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	
			L

Summative Examinations - Question Paper – Format



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

Course Nan	ne N	Aultimedia Lab								
Course Cod	le 2	UCSSP2					L	Р		С
Category	;	Skill					-	2		2
Nature of Co	ourse:	EMPLOYABILITY	✓	SKILLORIENTED	✓	ENTREPRI	ENE	URS	HIP	✓
Course Objectives:										
• To learn t	the ba	sics and Fundamentals	of N	Iultimedia animation.						
• To introd	uce M	Iultimedia components a	and	Tools.						
• To unders	tand h	now Multimedia can be	inc	orporated in real life						
To develop	op va	rious video and text app	lica	itions.						
• To Desig	n and	develop various Multin	ned	ia Systems applicable i	n rea	al time.				
S. No.	List of Programs						Hou	irs		
1.		Create an animation	to s	how a bouncing ball.						
2.		Create an animation	to s	how a moving stick ma	ın.					
3.		Create an animation	to s	how a fainting banana.						
4.		Create an animation	to s	how sunrise and sunse						
5.		Create an animation	to s	how a disappearing ho	use.					
6.		Create an animation	to s	how two boats sailing	in ri	ver				
7.		Create an animation	to s	how a scene of cricket	mat	ch.				
8.		Create an animation	to ł	elp teach a poem or a s	song	ŗ.			3	0
9.		Create an animation	to s	how cartoon with a me	ssag	ge			•	•
10		Create an animation	on	Single Perspective Vie	W					
11. 12		Create an animation	tot	solar system						
12.		Create an animation	101	cricket	C1					
13.		Create an animation	to	make a movie showing	g Sn	ape Tweening	<u>z</u> .			
14. 15		Create an animation	to	make a movie snowing	g IVI	otion I weenir	1g.	20		
15.	Create an animation to make a movie to a add sound and button to the movie									
					T	otal Lecture	Hour	·s	3	0
	0								_	
COURSE	OUI	COMES:						K	Lev	el
At the end of	f the c	ourse the students will b	e a	ble to						

At the e	end of the course the students will be able to	
CO1:	Perform the operations of various multimedia techniques.	K2
CO2:	Ability to know about techniques of image processing	K3
CO3:	Understand the various designing process in multimedia animation	K4
CO4:	Develop an interactive multimedia presentation by using multimedia devices	K3
CO5:	Identify practical aspects in designing latest multimedia applications	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	3	2	2	3
CO 2	3	3	2	2	3	3
CO 3	2	2	1	3	2	1
CO 4	3	2	2	3	2	2
CO5	2	2	2	2	2	3

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

LESSONPLAN

S. No.	List of Programs	Hrs	Mode
1.	Create an animation to show a bouncing ball.		
2.	Create an animation to show a moving stick man.		
3.	Create an animation to show a fainting banana.		
4.	Create an animation to show sunrise and sunset.		
5.	Create an animation to show a disappearing house.		
6.	Create an animation to show two boats sailing in river		
7.	Create an animation to show a scene of cricket match.		
8.	Create an animation to help teach a poem or a song		
9.	Create an animation to show cartoon with a message	10	Lab
10	Create an animation on Single Perspective View	10	demonstration
11.	Create an animation for solar system		
12.	Create an animation for cricket		
13.	Create an animation to make a movie showing Shape		
	Tweening.		
14.	Create an animation to make a movie showing Motion		
	Tweening.		
15.	Create an animation to make a movie to a add sound and button to the movie		

Course Designed by: Mr.B.Johnson & Dr S.Shaik Parveen



Academic Council Meeting Held On 17.05.2022



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

Course Name	DATA STRUCTURES	ANI) ALGORITHMS					
Course Code	21UCSC31					L	Р	С
Category	Core					5	-	5
Nature of course:	EMPLOYABILITY	✓	SKILL ORIENTED	✓	ENTREPRE	NEUR	SHI)
Course Objectives:								
• The objective of the course is to introduce the fundamentals of Data Structures								
Abstract	concepts and how these of	conc	epts are useful in proble	em s	solving			
• Analyze	step by step and develop	algo	rithms to solve real wo	rld	problems			
• Impleme	nting various data structu	ires	Stacks, Queues, Linke	d Li	sts,			
Trees and	d Graphs	0						
• Understan	nding various searching d	X SO	rting techniques file str	uctu	ires	1 <i>5</i> T	r	
Unit: I Intro	Data Structure: Data Ma	re no co	mant concents. Data tun	00	nrimitivo ond	15 F	lours	tivo
Types of Data S Performance Anal case analysis.	tructures- Linear & Non lysis and Measurement -Ti	Line me a	ar Data Structures. Bas and space analysis of alg	ics orith	- Algorithm and the second sec	Specif best a	f icatio and w	ons: orst
Unit: II Linea	ar Data Structure					15 H	lours	
Queue, Operation Double Ended Q Circular linked lis linked list.	spression And Their Complete so On Queue, Circular Qu ueue, Applications of Que st, Linked implementation	eue, eue, eue, 1 of	n, Recursion, Tower of F Priority Queue, Array i Linked List: Singly I Stack, Linked implemen	repre Linke tatio	n, Queue: Representation of I ed List, Doub on of Queue, A	presen Priorit ly Lii Applic	y Qu wheed wation	i Of eue, list, s of
Unit: III Nonli	inear Data Structure					15 E	lours	
Nonlinear Data traversal (Inorder, Trees To Binary T operations,Breadtl	Structure : Tree-Definiti , postorder, preorder), Threes, Applications Of Tree h First Search, Depth First S	ons eadeo s- G Searc	and Concepts, Represent d binary tree, Binary sea raph-Matrix Representat ch, Spanning Trees, Short	tation rch ion (test p	n of binary tra trees, Convers Of Graphs, Ele path, Minimal	ee, Bi ion of menta spann	nary f Gen ry Gi ing tro	tree eral caph ee
Unit: IV Sorti	ng and Searching					15 E	lours	
Sorting and Sear and Table Sort, L	ching -Insertion Sort, Qui inear Search, Binary Search	ck So h.	ort, Merge Sort, Heap So	ort, S	orting On Sev	eral k	Keys,	List
Unit: V Hash	ing and File Structures					15 H	lours	
Hashing And Fi Techniques, File Relative/Random file organization a	le Structures : Hashing: e Structure: Concepts File Organization, Indexin and access methods.	The of f ig str	symbol table, Hashing ields, records and fil ructure for index files, ha	g Fun es, ashir	nctions, Collis Sequential, ng for direct fi	ion-R Inde iles, N	esolu xed Iulti-	tion and Key
Total Lecture Hours 75 Hrs								
Books for Study	y:							
1. An I P	Introduction to Data Strue aul G. Sorenson Publishe	cture er-Ta	es with Applications. by ta McGraw Hill.	/ Jea	n-Paul Trem	blay d	&	
Books for Refer	rences:							
1. Fund	lamentals of Computer A amentals of Data Structu	lgor res i	ithms by Horowitz, Sal n C++-By SartaiSahani	hni,(Galgotia Pub.	2001	edit	ion
2. 1 3110								

	3. Data Structures: A Pseudo-code approach with C -By Gilberg & Forouzan	
	Publisher-Thomson Learning.	
Web F	Resources:	
	1. Data Structure and Algorithms Tutorial (tutorialspoint.com)	
	2. <u>https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf</u>	
	3. <u>https://www.programiz.com/dsa</u>	1
Cours	e Outcomes	K Level
At the	end of the course the students will be able to	
CO1	Be able to check the correctness of algorithms using inductive proofs and loop Invariants.	Upto K3
CO2	Be able to compare functions using asymptotic analysis and describe the relative merits of worst-, average-, and best-case analysis.	Upto K3
CO3	Become familiar with the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate.	Upto K3
CO4	Become familiar with a variety of sorting algorithms and their performance Characteristics (eg, running time, stability, space usage) and be able to choose the best one under a variety of requirements.	Upto K4
CO5	Be able to understand and identify the performance characteristics of File Structure	Upto 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	2	2	3	2	2	2
CO 3	3	2	3	3	2	2
CO 4	2	3	2	2	2	2
CO5	2	3	2	2	3	3

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

Unit	DATA STRUCTURES AND ALGORITHMS	Hrs	Pedagogy
I	Introduction To Data Structure: Data Management concepts, Data types – primitive and non-primitive, Types of Data Structures- Linear & Non Linear Data Structures. Basics - Algorithm Specifications: Performance Analysis and Measurement -Time and space analysis of algorithms- Average, best and worst case analysis	15	Chalk & Talk, ICT Kit
п	Stack: Stack-Definitions & Concepts, Operations On Stacks, Applications of Stacks, Polish Expression, Reverse Polish Expression And Their Compilation, Recursion, Tower of Hanoi, Queue: Representation Of Queue, Operations On Queue, Circular Queue, Priority Queue, Array representation of Priority Queue, Double Ended Queue, Applications of Queue, Linked List: Singly Linked List, Doubly Linked list, Circular linked list, Linked implementation of Stack, Linked implementation of Queue, Applications of linked list.	15	Chalk & Talk, ICT Kit
ш	Nonlinear Data Structure : Tree-Definitions and Concepts, Representation of binary tree, Binary tree traversal (Inorder, postorder, preorder), Threaded binary tree, Binary search trees, Conversion of General Trees To Binary Trees, Applications Of Trees- Graph -Matrix Representation Of Graphs, Elementary Graph operations, Breadth First Search, Depth First Search, Spanning Trees, Shortest path, Minimal spanning tree	15	Chalk & Talk, ICT Kit
IV	Sorting and Searching - Insertion Sort, Quick Sort, Merge Sort, Heap Sort, Sorting On Several Keys, List and Table Sort, Linear Search, Binary Search.	15	Chalk & Talk, ICT Kit
V	Hashing And File Structures : Hashing: The symbol table, Hashing Functions, Collision-Resolution Techniques, File Structure: Concepts of fields, records and files, Sequential, Indexed and Relative/Random File Organization, Indexing structure for index files, hashing for direct files, Multi-Key file organization and access methods.	15	Chalk & Talk, ICT Kit

LESSON PLAN

Course Designed by: Mr. B.Johnson & Mrs.J.Anitha Gracy

	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	Section			
Internal	Cos	K Level	MCQ)s	Short Ans	swers	С	D			
meeniu	COS	K Level	No. of. Questions	K - Level	No. of. Questions	K – Level	Either or Choice	Open Choice			
CI	CO1	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)			
AII	CO4	Up to 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 Marl		ks for each juestion	1		2		5	10			
	Tota eac	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)

		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	
СТА	K3	-	-	20	20	40	80	80	
	K4	-	-	-	-	-			
1	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	_	4	8	20	
	K2	2	4	-	-	6	12	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	MOQsShort AnswersNo. of uestionsK - LevelNo. of Questio nsK - 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 Questi Askee	ons to be d	10		5		10	5		
No.	of Questi answer	ions 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	in parenthe	esis denotes, q	uestions s	hould be a	sked 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	17
K2	5	10	-	-	15	12.5	1/
K3	-	-	30	30	60	50	50
K4	-	-	20	20	40	33.33	33
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	A (Mu	ltiple 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 (Sho	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	<u>CO4</u>	K2	
15	CO5	K2	
Section	C (Eit	her/Or Ty	pe)
Answei	r A Q	uestions	$(5 \times 5 = 25 \text{ marks})$
Q.No	<u>CO</u>	K Level	Questions
16) a	<u>COI</u>	K3,K3	
16) b	<u>CO1</u>	K3,K3	
1/)a	$\frac{CO2}{CO2}$	K3,K3	
1/) D	$\frac{CO2}{CO2}$	K3,K3	
18) a	$\frac{CO3}{CO3}$	K3,K3	
18) D	$\frac{CO3}{CO4}$	KJ,KJ	
19) a	$\frac{CO4}{CO4}$	K4,K4	
19) b	$\frac{C04}{C05}$	K4,K4	
20) a	<u>C05</u>	K4,K4	
20) D	$\frac{005}{2}$	K4,K4	among of the students is to be assessed by attempting high or
ND: HI	gner ie	ver of perio	ormance of the students is to be assessed by attempting higher
Section	\mathbf{N} leve	15 on Choice	
Answor	r Any T	Three ques	tions (3v10-30 morks)
O No		K I ovol	Ouestions
21	C01	K3	Questions
21	$\frac{001}{002}$	K3	
22	$\frac{002}{003}$	K3	
23	$\frac{003}{004}$	K4	
25	CO5	K4	
25	005	117	

Summative Examinations - Question Paper – Format



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

Course Nan	ne	DATA STRUCTURES	AND ALGORITHMS -	LA	B			
Course Cod	e	21UCSCP3				L	Р	C
Category		Core				-	4	4
Nature of co	ourse:	EMPLOYABILITY	SKILL ORIENTED	✓	ENTREPREN	EUR	SHI	þ
Course obje	ectives	•						
• To kno	ow the	real time usage of Data	a Structures					
• To une	derstan	d basic concepts of Lin	ear and nonlinear data S	Struc	tures.			
• To une	derstan	d importance of data st	ructures in context of w	riting	g efficient prog	ram	IS	
• To dev	velop s	kills to apply appropria	te data structures in prol	blem	solving			
• To Un	derstar	nd the elements handlin	g in various data structu	ires				
S. No.			List of Programs				Ho	urs
1.	Write	e C++ Program to inser	t an Element in an Array	у.				
2.	Write	e C ++ Program to delet	e an Element in an Arra	у.				
3.	Write	e a C++ Program to sor	t the elements using Inse	ertio	n sort.			
4.	Write	e a C++ Program to sor	t the elements using But	oble	sort.			
5.	Writ	te a $C++$ Program to so	rt the elements using Sel	lecti	on sort.			
6.	Write	e a C++ Program to sor	t the elements using hea	p so	rt.			
7.	Write	e a C ++ Program to sea	irch the elements using I	inea	r search.			
8.	Write	e a C ++ Program to sea	non the elements using t	iona	y search.		6	0
9.	Write	c = a C + + Program to impose a C + + Program to impose to impose the test of te	plement STACK operati	ons				
10.	Write	c = a C + Program to ing	ert delete and store the	elerr	ents using link	ed		
11.	list		ert, delete and store the		ients using mik	cu		
12.	Write	e a C++ Program to im	plement Binary Search 7	Trees	2			
13.	Write	e a C++ Program to imp	plement Tree traversal		•			
14.	Write a C_{++} Program to implement Sequential file concept							
15.	Write	e a C++ Program to imp	plement Indexed file cor	ncep	t.			
	•			-	Total Hou	irs	60)

- 1. The C++ Programming Language: Special Edition.
- 2. Effective C++: 55 Specific Ways to Improve Your Programs and Designs (3rd Edition)
- 3. Michael T. Goodrich, Roberto Tamassia, David M. Mount, Data Structures and Algorithms in C++,

ISBN 978-0-470-38327-8, February 2011. Paperback, 736 pages

Web Resources:

- 1. <u>https://www.tutorialspoint.com/data_structures_algorithms/index.htm</u>
- 2. https://www.digimat.in/nptel/courses/video/106105225/L01.html
- 3. <u>https://www.youtube.com/watch?v=DXuIf4JCvRk</u>

COURS	E OUTCOMES:	K L ovol
At the end	d of the course the students will be able to	K Level
CO1	Infer the basic concepts of Arrays.	K2
CO2	Summarizing the knowledge of applications of data structures including the ability to implement algorithms for the creation, insertion, deletion, sorting of each data structure.	К3
CO3	Use the concepts of searching the element in data structures.	К3
CO4	Sketch the concepts of QUEUE and STACK, Linked list data structure.	К3
CO5	Classify the concepts of Trees.	K 4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	1	3
CO 2	3	3	2	3	2	3
CO 3	2	3	3	2	2	2
CO 4	2	2	1	3	3	3
CO5	3	3	2	1	3	3

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

LESSON PLAN

S. No.	List of Programs	Hours	Mode
1.	Write C++ Program to insert an Element in an Array.		
2.	Write C++ Program to delete an Element in an Array.		
3.	Write a C++ Program to sort the elements using Insertion sort.		
4.	Write a C++ Program to sort the elements using Bubble sort.		
5.	Write a C++ Program to sort the elements using Selection sort.		
6.	Write a C++ Program to sort the elements using heap sort.		
7.	Write a C++ Program to search the elements using linear search.		Plack Doord
8.	Write a C++ Program to search the elements using binary search.	60	Diack Doard,
9.	Write a C++ Program to implement QUEUE operations.	00	Lau Domonstratio
10.	Write a C++ Program to implement STACK operations.		n and I CD
11.	Write a C++ Program to insert, delete and store the elements using linked		Il allu LCD
	list.		Projector.
12.	Write a C++ Program to implement Binary Search Trees.		
13.	Write a C++ Program to implement Tree traversal.		
14.	Write a C++ Program to implement Sequential file concept.		
15.	Write a C++ Program to implement Indexed file concept.		
Tota	al Hours	60	

Course Designed by: Mr. B.Johnson & Mrs.J.Anitha Gracy



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

Course N	ame	NU	MERICAL APTIT	U DE					
Course C	ode	21 U	MCA31			L	Р	С	
Category		Alli	ed			5	-	4	
Nature of	course:	E	MPLOYABILITY	SKILL ORIENTED	ENTREP	REN	IUR	SHIP	
Course Ob	jectives:								
• To	improve the	e bas	ic mathematical skil	lls and to help students	who are p	repar	ing	for any	
type	e of compet	itive	examinations.						
• To	enrich their	knov	wledge and to develo	p their logical reasoning	g thinking a	bility	/.		
• To compute either speed, distance, or time with 90% accuracy.									
• To	know and h	ow t	o use the formula for	calculating simple inter	est.				
• To	understand	how	to algebraically man	ipulate the interest form	ulas to solv	ve for	diff	ferent	
var	iables.								
Unit: I	H.C.F and I	L.C.N	A of Numbers - Aver	age				15 hrs	
Unit: II	: II Problems on Ages - Percentage							15 hrs	
Unit: III	Ratio and p	ropo	rtions - Time and Dist	ance				15 hrs	
Unit: IV	it: IV Simple interest- Compound interest							15 hrs	
Unit: V	V Calendar – Permutations and Combinations							15 hrs	
				Tota	al Lecture	Hou	`S '	75 hrs	
Book for	Study:								
Text Book	: Dr. R. S. A	ggar	wal, 'Quantitative A	Aptitude' S.Chand and co	ompany lim	ited,	New	7	
тт	Delhi, Rep	orint 2	2017						
Un		: Cl	hapter: $2 \& 6$						
			hapter: 8 $\propto 11$						
			apter: 15 & 18						
UI. Ur	lit IV		Tapter: $22 \propto 25$						
		. 01	lapter. 27 & 50						
Books for	· Reference	:							
1. Al	ohijit Guha,	"Qu	antitative Aptitude	" for All Competitive I	Examinatio	ons, l	McC	braw	
Hi	Il Educatior	n (Ind	dia) Private Limited,	6 th Edition, 2017.					
2. Di	nesh Khatta	ar, "(Quantitative Aptitu	de" for Competitive E	xaminatio	ns, P	earse	on	
Ine	dia Educatio	on Se	ervices Pvt. Ltd., 4 th	Edition, 2020.					
Web Res	ources:								
1. <u>ht</u>	tps://www.	thinl	<mark>kiit.in/pre-foundati</mark> e	on/english/class-10/men	tal-ability	<u>/</u>			
2. <u>ht</u>	tps://www.i	india	<u>abix.com/non-verba</u>	l-reasoning/questions-a	and-answe	<u>rs/</u>			
3. <u>ht</u>	tps://www.	<u>slide</u>	<u>share.net/MyPrivat</u>	<u>eTutor/study-material</u>	<u>-for-comp</u>	<u>etitiv</u>	<u>e-ex</u>	<u>kams-</u>	
<u>ve</u>	rbal-non-v	<u>erba</u>	l-reasoning-mathen	natics-operation					
4. <u>ht</u>	tps://banke	exam	<u>portal.com/study-n</u>	naterial/reasoning-verb	al/non-vei	rbal-	anal	logy-	
<u>m</u>	4. <u>https://bankexamportai.com/study-material/reasoning-verbal/non-verbal-analogy-</u> men								
 <u>https://www.slideshare.net/MyPrivateTutor/study-material-for-competitive-exams-verbal-non-verbal-reasoning-mathematics-operation</u> <u>https://bankexamportal.com/study-material/reasoning-verbal/non-verbal-analogy-mcq</u> 									

Course Ou	Course Outcomes:					
After the completion of the course, Students will be able to						
CO1:	Acquire the knowledge of numbers.	K3				
CO2:	Understand the concepts of ratio and proportions.	K3				
CO3:	Appear for Competitive Examinations.	K4				
CO4:	Find HCF and LCM	K3				
CO5:	Understand the difference between ordinary interest and exact interest, and be able to calculate both.	К3				

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	3	2
CO 2	2	3	3	2	3	3
CO 3	2	3	2	2	2	2
CO 4	3	2	2	2	2	3
CO5	3	3	2	2	3	3

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

LESSON PLAN

UNIT	COURSE NAME	Hrs	Pedagogy
Ι	H.C.F and L.C.M of Numbers - Average	15	Chalk & Talk, PPT
II	Problems on Ages - Percentage	15	Chalk & Talk, Group Discussion
III	Ratio and Proportion - Time and Distance	15	Chalk & Talk, LCD
IV	Simple interest - Compound interest	15	Chalk & Talk, Seminar
V	Calendar – Permutations and Combinations	15	Chalk & Talk, Seminar

Course designed by: Dr. P. Visvanathan and Mrs . H. Sowmiya Gowri

	Learning Outcome Based Education & Assessment (LOBE)									
		Ar	r ticulation M	I ormative Ex	Levels w	on - Blue Pr	int Outcom	es (COs)		
				Section	n A	Section	n B		Section	
Inter	C		T Z T 1	MCQ)s	Short Ans	swers	Section C	D	
nal	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	K2	2(K3&K3)	1 (K3)	
AI	C	02	Up to K3	2	K2,K2	2	K2	2(K3&K3)	1 (K3)	
CI	C	03	Up to K4	2	K1,K2	1	K2	2(K3&K3)	1 (K4)	
AII	C	04	Up to K3	2	K2,K2	2	K2	2(K3&K3)	1 (K3)	
		Qu	No. of uestions to be asked	4		3		4	2	
Questie Patter	on n	No. of Questions to be answered		4		3		2	1	
	a	Ma	rks for each question	1		2		5	10	
		Т	otal 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	1	-	-	-	1	2	20
	K2	3	6	-	-	9	18	20
	K3	-	-	20	20	40	80	80
CIA	K4	-	-	-	-	-	-	-
Ι	K5	-	-	-		-	-	-
	Marks	4	6	20	20	50	100	100
	K1	1	-	-	-	1	2	20
	K2	3	6	-	-	9	18	20
СТА	K3	_	_	20	10	30	60	60
	K4	_	_	-	10	10	20	20
11	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	Summativ	ve Examinati	on – Blue Pri	int Articu	lation Map	ping – K	Level with	Course
				utcomes	(COS) Short An	CINO MC	Section C	
S.No	COs	K - Level	No. of Questions	K – Level	No. of Question	K – Level	(Either / or Choice)	Section D (Open 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	K3	2	K1&K2	1	K2	2 (K3 &K3)	1 (K3)
No	of Quest. Aske	tions to be ed	10		5		10	5
No	of Quest answe	tions to be pred	10		5		5	3
Mar	ks for eac	ch question	1		2		5	10
Total I	Marks for	each section	10		10		25	30
	(Figures	in parenthesi	is 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	4	-	-	9	7.5	14	
K2	5	6	-	-	11	9.17	10	
K3	-	-	40	40	80	66.67	67	
K4	-	-	10	10	20	16.67	17	
Marks	10	10	50	50	120	100	100	
NB: Hig	gher level of p	erformance o	of the students	s is to be asse	essed by a	attempting	higher level	
of K lev	els.							

Section	A (Mul	tiple Choice	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 (Shoi	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	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	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	D (Ope	n Choice)	
Answer	Any T	hree questio	ons (3x10=30 marks)
Q.No	<u>CO</u>	K Level	Questions
21		K3 K2	
22	CO2	K3	
23	003	K4	
24	CO4	K3	
25	005	K3	

Summative Examinations - Question Paper – Format



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

Course Name	W	VEB DESIGN LAB						
Course Code	2	1UCSSP3				L	Р	С
Category	S	Skill				-	2	2
Nature of cour	rse:	EMPLOYABILITY	SKILL ORIENTED	✓	ENTREP	REN	EUF	۱SHIP
Course object	ives:			•				
 Be acqua Develop Practice Designin Practice 	the c the c the u g of Hype	d with elements, Tags and concept of basic and advan use of multimedia compon webpage-Document Layo er linking, Designing of w	l basic structure of HTM nced text formatting. ents in HTML documen out, Working with List, V vebpage-Working with F	IL fi ats. Wor Fram	les. king with es, Forms	Table and	es. Con	trols.
S. No.		I	List of Programs				I	Iours
1.To design a web page using tags in HTML.2.To design a class timetable in web page using HTML3.To create table in a HTML web page using table span attribute.4.To design a web page using ordered/unordered list html tags.5.To design a web page using Nested List.6.To design a webpage in HTML those consist of many frames.7.To design a webpage in HTML that consists of many Nested Frames8.To create a drop down box in webpage using HTML code.10.To create a login form in a HTML webpage.11.alignments.12.To create a login form in a HTML webpage.13.To design a calculator in a web page using HTML Tags.16.To design a Web page for adding style with CSS.16.To design a Web page to publish in online using CSS.					30			
Doolra for Dofor		0.04			Tua	1100	15	50
1. Thomas A 2. N.P. Gop Second P Web Resource	A. Por alan Printin	well, HTML& XHTML, 7 and J. Akilandeswari, We ng, July 2008.	TMH, Fourth Edition, The Technology A Develo	hirte oper [*]	enth Repr 's Perspec	int, 2 tive, 1	007 PHI	· ,
1. <u>https://n</u> 2. <u>https://w</u> 3. https://w	i <mark>ptel.</mark> vww. vww.	.ac.in/courses/106/105/10 .my-mooc.com/en/mooc/ .freecodecamp.org/news	<u>)6105084/</u> <u>html-css-and-javascrip</u> /html-and-html5-exam	<u>ot/</u> ple/				

COURS	E OUTCOMES:	K Level
At the end	d of the course the students will be able to	
CO1	Demonstrate page layout, color schemes and typography in the designs.	K1
CO2	Write valid and concise code for webpage	K1
CO3	Demonstrate knowledge of artistic and design components that are used in the creation of a web site.	K2
CO4	Design static websites that meet specified needs and interests	K2
CO5	Select appropriate HTML code from public repositories that enhances the experience of web application design	K2

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	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
CO5	3	2	2	2	2	3

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

LESSONPLAN

S. No	. List of Programs	Hrs	Mode
	To design a web page using tags in HTML.		
	To design a class timetable in web page using HTML		
	To create table in a HTML web page using table span		
1.	attribute.		
2.	To design a web page using ordered/unordered list html tags.		
3.	To design a web page using Nested List.		
4.	To design a webpage that link to other web pages anchor tag.		
5.	To design a webpage in HTML those consist of many		
6.	frames.		
7.	To design a webpage in HTML that consists of many Nested		
8.	Frames in		Black Board,
	a frameset.		Lab
9.	To create a drop down box in webpage using HTML code.	30	Demonstration
10.	To design a webpage to display the paragraphs with various		and LCD Projector.
11.	alignments.		
12.	To create a login form in a HTML webpage.		
	To design a HTML web pages using images as a icon and		
13.	page		
14.	background		
15.	To design a calculator in a web page using HTML Tags.		
16.	To design a Web page for adding style with CSS.		
	To develop a Web page to publish in online using CSS.		
	To create a Web page with advanced style techniques using		
	CSS.		

Course Designed by: Mr.S.R.Mathusudhanan & Dr.S.Veerapandi



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

Course Name	MULTIMEDIA TECHNOLOGIES				
Course Code	21UCSN31		L	Р	С
Category	Non Major Elective Course		2	-	2
Nature of course	: EMPLOYABILITY SKILL ORIENTED 🗸	ENTREPREN	EUR	SHIP	
Course Objectiv	res:				
 To gain th To unders computer To unders To unders To learn I To learn t 	te basic knowledge of Content and copyrights Resource tand the fundamental concepts of Operating systems and Architecture. tand the purpose of Images and color-Graphics file and Digital video-Digital video data sizing-Video capture and he basic concepts of HTML and web authoring.	s for multimedia d software-Mult application forn d playback syste	deve imedi nats. ems.	loper a	s.
Unit: I IN	TRODUCTION TO MULTIMEDIA			6 Ho	urs
Multimedia intr developers. Prod	oduction-multimedia market-Content and copyrights ucts and Evaluation: Types of products-Evaluation.	Resources fo	or mu	ıltime	edia
Unit: II H	ARDWARE, OPERATING SYSTEMS AND SOFTV	VARE:		6 Ho	ours
computer Archit computer Archit Text data files-U	ecture-Computer Architecture standards-Operating syst ecture-Software executable and Libraries-Software dri sing text in multimedia Applications Hypertext.	vers. Text: Eler	nents	of t	edia ext-
Unit: III G	RAPHICS:			6 Ho	ours
digital audio Dig Using audio to en	Jsing graphics in multimedia applications. Digital audio ital audio systems-MIDI-Audio file formats-Using audio hance other contents-Audio for content delivery.	: Characteristics	of sc appli	ound a cation	and ns-
Unit: IV D	GITAL VIDEO AND ANIMATION:			6 Ho	ours
Background on playback systems	video-Characteristics of Digital video-Digital video d c-Computer animations-Using digital video in multimed	ata sizing-Vide ia applications.	o cap	ture	and
Unit: V M	ULTIMEDIA AND THE INTERNET:	••		6 Ho	ours
The internet-H ² considerations fo	TML and web authoring-Multimedia consideratio r the Web pages.	ns for the I	nterne	t-De	sign
	Total 1	Lecture Hours	30 I	Irs	
Books for Study Multimedia Tech Unit I: Cha Unit II: Ch	: nology and Applications by David Hillman, Galgotia Po pter 1,2 apter 3,4	ublication Pvt L	td.		
Unit III: Cl	napter 5,6				
Unit IV: Cl	napter 7				
1 Principles of	ences: of Multimedia - Ranjan Parakh - TMCH New Delbi - T	welfth Renrint			
1.11110101050	n multimedia - Kanjan i arekii - Timori, new Dellii - T	wonth Kepi III,			

2. Fund	2. Fundamental of Multimedia - Ze-Nian Li & M. S. Drew				
Web Res	ources:				
1. <u>ht</u>	tps://www.tutorialspoint.com/multimedia/multimedia_introduction.htm				
2. <u>ht</u>	tps://slideplayer.com/slide/12810303/				
Course O	utcomes	K Level			
At the en	d of the course the students will be able to				
CO1:	Know the basic resources of multimedia developers	K2			
CO2:	Know about Operating systems and Multimedia computer Architecture	K2			
CO3:	Understand the concepts graphics-Images and color.	K2			
CO4:	Understand about digital video-digital video data sizing-Video capture	K2			
CO5:	Understand the usage of Multimedia in Web Page Design	K2			

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	3	3	3	2	3
CO 2	2	2	3	2	3	3
CO 3	3	2	3	2	3	3
CO 4	3	3	2	3	2	2
CO5	2	2	3	3	2	3

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

LESSON PLAN

Unit	MULTIMEDIA TECHNOLOGIES	Hrs	Pedagogy
Ι	INTRODUCTION TO MULTIMEDIA: Multimedia introduction- multimedia market-Content and copyrights Resources for multimedia developers. Products and Evaluation: Types of products-Evaluation.	6	Chalk & Talk, ICT Kit
п	HARDWARE, OPERATING SYSTEMS AND SOFTWARE: Computer Architecture-Computer Architecture standards-Operating systems and software-Multimedia computer Architecture-Software executable and Libraries-Software drivers. Text: Elements of text-Text data files-Using text in multimedia Applications Hypertext.	6	Chalk & Talk, ICT Kit
ш	GRAPHICS: Elements of graphics-Images and color-Graphics file and application formats-Obtaining images for multimedia use-Using graphics in multimedia applications. Digital audio: Characteristics of sound and digital audio Digital audio systems-MIDI-Audio file formats-Using audio in Multimedia applications-Using audio to enhance other contents-Audio for content delivery.	6	Chalk & Talk, ICT Kit
IV	DIGITAL VIDEO AND ANIMATION: Background on video- Characteristics of Digital video-Digital video data sizing-Video capture and playback systems-Computer animations-Using digital video in multimedia applications.	6	Chalk & Talk, ICT Kit
V	MULTIMEDIA AND THE INTERNET: The internet-HTML and web authoring-Multimedia considerations for the Internet-Design considerations for the Web pages.	6	Chalk & Talk, ICT Kit

Course Designed by: Mr.S.R.Mathusudhanan & Mrs. K. Sandya



Academic Council Meeting Held On 17.05.2022



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

Course Nam	e RELATIONAL DATAB	ASE MANAG	EMENT SYSTEN	1			
Course Code	21UCSC41				L	Р	С
Category	Core				5	-	4
Nature of cou	rse: EMPLOYABILITY	✓ SKILL	ORIENTED	ENTREPR	ENEU	JRSH	HIP
Course object	tives:	1 1					
 To str To rel To rel To To rel To To T	understand the basic concepuctures. develop the logical design of ationship diagrams. understand the relational da emphasize the importance of Master the basics of SQL ar DBMS tion and Information Proc iles, File organization and zation – Storage media. In Why a database – Character	ts of database f the database cabase design f normalization d construct que essing: Introc file structur troduction to	systems and fam using data mode principles. n in databases. teries using SQL luction – Definiti es: Introduction Database Man in a Database –	iliar with data ling concepts on of inform – Operations nagement Sy Why DBMS	abase such ation, s on f ystem	stora as en 15 H Qua iles (DE	ours lity o – Filo BMS) f Dat
Introduction –	Why a database – Character	ristics of data	in a Database –	Why DBMS	– Typ	bes of	f Data
	ient System.					4 - 11	
	DBMS				~	15 H	ours
The Relational R) Modelling Normalization Boyce – Codd	data structure – Relational d : E-R model – Compone : Introduction – First Norm Normal Form – Fourth Norm	lata manipula nts of an E- nal Form – S nal Form – Fif	ion – Codd's rul R model – E-H econd Normal Form th Normal Form	es. Entity - I R modelling orm – Third – Demoraliza	Relati syml Norm tion.	onsh ools. nal Fe	ip (E Data orm -
Unit: III	Relational algebra & calcul	us and SQL				15 H	ours
Relational alg Structured Qu types and Lite Logical operat	ebra and Relational calculation rery Language: Introduction rals – Types of SQL comma prs - Set operators – Operato	is: Relational n – Characteri nds – SQL o r precedence.	algebra - Relatio stics of SQL - Ac perators – Arithn	nal calculus. lvantages of s netic, Compar	Intro SQL - rison	duct - SQ opera	ion to L data ators
Unit: IV	SQL Schemas , Sub Querie	s, Operations	and Functions			15 H	ours
Tables, Viev	vs and Indexes: Tables-Vi	ews. Queries	and Sub quer	ies: Queries	- Si	ıb qı	ueries
Aggregate fu	nctions – Joins and Unions	Joins.					
Unit: V	Cursor and Triggers					15 H	ours
Cursor: Curso – Trigger synta and Dropping	or operations – Cursor positions	ons – Cursor (s – Setting ins isadvantages (coding guidelines erted values – Er of triggers.	. Triggers: Tabling / Disa	Гуреs bling,	of tr Rep	igger lacing
	1		Tota	Lecture Ho	urs	75 H	ours
Books for Stu 1. Alexis	dy: Leon and Mathews Leon, D	atabase Mana	gement Systems,	Leon Vikas I	Publis	hing	, Nev
Academi	c Council Meeting Held On	17.05.2022			Pα	oge 5'	7

	Delhi, 1999.	
	Unit I: Chapter 1,3 and 5	
	Unit II: Chapter 7,9 and 11	
	Unit III: Chapter 12 and 14	
	Unit IV: Chapter 15,17,18 and 21	
1	Unit V: Chapter 20 and 25	
Book fo	or References:	
1.	Abraham Silberschtz, Henry F. Korth, S.Sudershan, Data Base System Concepts, McGraw Hill International Editions, New Delhi, 2002.	4th Edition,
2.	Date C.J., An Introduction to Database Systems Vol.1, Narosha Publishing House, 1995.	New Delhi,
3.	Rob, Coronel, "Database Systems", Seventh Edition, Cengage Learning.	
4.	Elmasri, R. and S. B. Navathe: Fundamentals of Database Systems (5th Ed.), Addis 2007.	son Wesley,
5.	Jeffrey A. Hoffer, Mary B. Prescott, and Fred R. McFadden. Modern Database M (8th Ed.). Prentice-Hall, 2007	lanagement
Web]	Resources:	
1.	https://byjus.com/govt-exams/database-management-system-dbms/	
2.	https://www.tutorialspoint.com/sql/sql-rdbms-concepts.htm	
3.	https://www.studytonight.com/dbms/rdbms-concept.php	
4.	https://www.javatpoint.com/dbms-tutorial	
5.	https://www.geeksforgeeks.org/sql-tutorial/	
COUR	SE OUTCOMES:	
At the	end of the course the students will be able to	K Level
CO1	Enumerate the underlying concepts of the management of database systems.	Upto K3
CO2	Describe the structure and model of the relational database System	Upto K3
CO3	Analyze a database based on a data model considering the normalization to a specified level	Upto K3
CO4	Construct simple and moderately advanced database queries using Structured Query Language (SQL)	Upto K4
CO5	Design multiple tables using group functions, sub queries and Implement cursor and trigger concept for a given scenario	Upto K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	3	2	3	3
CO 2	2	2	3	2	1	3
CO 3	3	3	3	3	2	3
CO 4	2	3	2	2	1	3
CO5	2	3	2	2	3	3

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

LESSON PLAN

UNIT	RELATIONAL DATABASE MANAGEMENT SYSTEM	Hrs	Mode
I	Data, Information and Information Processing: Introduction – Definition of information, Quality of information. Files, File organization and file structures: Introduction – Operations on files – File storage organization – Storage media. Introduction to Database Management System (DBMS): Introduction – Why a database – Characteristics of data in a Database – Why DBMS – Types of Data Base Management System.	15	Chalk & Talk, ICT Kit
II	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.	15	Chalk & Talk, ICT Kit
ш	Relational algebra and Relational calculus: Relational algebra - Relational calculus. Introduction to Structured Query Language: 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	Tables, Views and Indexes: Tables-Views. Queries and Sub queries: Queries – Sub queries. Aggregate functions – Joins and Unions: Joins.	15	Chalk & Talk, ICT Kit
V	Cursor: Cursor operations – Cursor positions – Cursor coding guidelines. Triggers: Types of triggers – Trigger syntax – Combining Trigger types – Setting inserted values – Enabling / Disabling, Replacing and Dropping Triggers – Advantages and disadvantages of triggers.	15	Chalk & Talk, ICT Kit

Course Designed by: Mrs. S.Amutha & Dr.G.Devika

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	Section	
Internal	Cos	K Level	MCQ)s	Short Ans	swers	С	D	
Internal	CUS	K Levei	No. of. Questions	K - Level	No. of. Questions	K – Level	Either or Choice	Open Choice	
CI	CO1	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K1	2(K3,K3)	1(K3)	
AII	CO4	Up to 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 &	Ques	No. of stions to be nswered	4		3		2	1	
Π	Mar	ks for each uestion	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	20	
	K2	2	4	-	-	6	12	20	
	K3	-	-	20	20	40	80	80	
CIA I	K4	-	-	-	-	-			
	Marks	4	6	20	20	50	100	100	
	K1	2	2	-	-	4	8	20	
	K2	2	4	-	-	6	12	20	
CIA	K 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.
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 A No. of Questio ns	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	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 Questi Asked	ons to be 1	10	K1,K2	5	К2	10	5		
No.of Questions to be answered		ons to be ed	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	К2	25	30			
	(Figures	in parenthe	sis denotes, q	uestions s	hould be a	sked 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	17		
K2	5	10	-	-	15	12.5	17		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	33.33	33		
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 (Multiple Choice 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	K2						
12	CO2	K2						
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	<u>CO1</u>	K3,K3						
16) b	COI	K3,K3						
17) a	CO2	K3,K3						
17) b	<u>CO2</u>	K3,K3						
18) a	<u>CO3</u>	K3,K3						
18) b	<u>CO3</u>	K3,K3						
19) a	<u>CO4</u>	K4,K4						
19) b	<u>CO4</u>	K4,K4						
20) a	<u>CO5</u>	K4,K4						
20) b	<u>CO5</u>	K4,K4						
NB: Hi	gher lev	el of perfor	mance of the students is to be assessed by attempting higher level of K					
levels								
Section	D (Ope	en Choice)	(2-10, 20 - 20)					
Answer		W L aval	Ouestions (SXIU=30 MarKs)					
21 21	$\frac{0}{0}$	K Level	Questions					
21	<u>CO1</u>	KJ K2						
22	$\frac{CO2}{CO2}$	NJ V2						
23	$\frac{003}{004}$	KA KA						
24	C04	K4 K4						
23	COS	N 4						

Summative Examinations - Question Paper – Format



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

Course	se Name RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB						
Course	Code	21UCSCP4			L	Р	С
Catego	ory	Core			-	4	4
Nature	of course	EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPREN	EURS	HIP	✓
Course	e objecti	es:					
 To provide a sound introduction to the creation of problem statements from real life situations. To give a good formal foundation on the relational model of data and usage of Relational Algebra To introduce the concepts of basic SQL as a universal Database language. To enhance knowledge of advanced SQL topics like embedded SQL, procedures connectivity 						s. gebra. y	
• To	ougn JDF enable th	C. e design of an efficient data	base using normalization	concents			
S. N	0.	e design of an efficient date	List of Programs			H	Iours
1 2 3 4 5 6 7 8 9 10 11 12 13 14	DI Ke Aş Jo Vi In SC PI Ex Tr Cu Su Fu Pac	DL and DML Commands w y Constrains-Normalization gregate functions ns ews lex L Queries / SQL ception handling ggers rsors pprograms-procedure PL/ S ctions of PL/ SQL kages	ith Examples				60
				Tota	al Hou	rs	60
Web Resources: 1. https://www.tutorialspoint.com/sql/sql-overview.htm 2. https://www.w3schools.com/sql/ 3. https://www.w3schools.com/sql/ 4. https://www.geeksforgeeks.org/sql-tutorial/ 5. https://www.geeksforgeeks.org/sql-tutorial/							
COURS	E OUT	COMES:	ha abla ta			K	Level
CO1	Use data	manipulation language to o	uery, update and manage	a database		Un	to K3
CO2	Describe	the fundamental elements of	of relational database mai	nagement systems	5	K	2.K3
CO3	Analyze	he database using oueries t	o retrieve records		-		–, K3
CO4	Create v	ews to satisfy the user's ch	anging requirements				K4
		the user's construction of the user's clic	inging requirements				174

CO5 Apply PL/SQL for processing data base.

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	2	2	2	2	3	2
CO 3	3	2	2	2	2	2
CO 4	2	2	2	2	2	3
CO5	2	3	3	3	2	2

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

LESSONPLAN

1.DDL and DML Commands with Examples2.Key Constrains-Normalization	
3.Aggregate functions4.Joins5.Views6.Index7.SQL Queries8.PL/ SQL9.Exception handling10.Triggers11.Cursors12.Subprograms-procedure PL/ SQL13.Functions of PL/ SQL	x Board, Lab nstration l LCD jector.

Course Designed by : Mrs. S.Amutha & Dr. S. Shaik Parveen

K3



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

Course Name	OPERATIONS RESEARCH						
Course Code	21UMCA41			L	Р	С	
Category	ALLIED			5	-	5	
Nature of cours	e: EMPLOYABILITY	SKILL ORIENTED	ENTREP	REN	URS	HIP	
COURSE OBJ	ECTIVES:						
• To	o illustrate linear problem, specia	al forms and game theory.					
• To evaluate game theory and linear problems.							
• To compare different types of methods in solving linear problem							
• Te	o solve linear programming	problem.					
• T	o design real life problem int	to a linear problem.					
Unit: I					1	5	
Linear Program Solution by Gr M Method only	nming Problem - Mathemati aphical Method, The Simple y).	cal formulation of the prox method and Method of	oblem – penalty (I	Big			
Unit: II					1	5	
Duality – Dual S	implex Method- Problems.						
Unit: III					1	5	
Transportation MODI method	problem – Mathematical fo for both balanced and unbal	rm – Initial solutions by anced TP- The Assignme	all metho ent Proble	ds – n.			
Unit: IV					1	5	
Game theory – – Solution of LPP method.	Two Person Zero Sum Gan game by using formula, Gra	ne – saddle point – Game aphical method, Method	e with sad of Domin	dle p ance	oint and		
Unit: V					1	5	
Sequencing – Re	eplacement Problem				<u> </u>		
		Tota	al Lecture	Hou	rs 7	5	
Kanti Sv Rese Rep Unit	 varup, P.K. Gupta and Man earch Sultan Chand and Sortint 2006. I - Chapter 2 Section 2.2 Chapter 3 Section 3.1 Chapter 4 Section 4.1 to II - Chapter 5: Section 5.1 to 	Mohan, Operations ns Publications, New Del to 3.5 o 4.4 o 5.4 and 5.7	hi,				

	Unit III - Chapter 10: Section 10.1 to 10.5, 10.8 to 10.11 and 10.14	
	Chapter11: Section 11.1 to 11.4	
	Unit IV - Chapter17: Section 17.1 to 17.7	
	Unit V - Chapter 12: Section 12.1 to 12.5	
	Chapter 18: Section 18.1 & 18.2	
Books	for References:	
1.Dr.S.A	Arumugam and ISAAC, Topics in Operations Research -Linear Programming,Ne	W
Gamma	Publishing House, Palayamkottai, June 2012.	
2.P.R.V	ital and V.Malini, Operations Research , Margham Publications, Chennai, 2002.	
3.Hamd	y A.Taha – Operations Research, An Introduction, 8th Edition, Prentice-Hall India	a ,2006.
Web R	esources	
1. <u>http</u>	s://mrcet.com/downloads/digital_notes/ME/IV%20year/Operations%20Resea	arch.pdf
2. <u>http</u>	://lipas.uwasa.fi/~tsottine/lecture_notes/or.pdf	
3. <u>http</u>	s://mrcet.com/downloads/digital_notes/ME/IV%20year/Operations%20Researcher	arch.pdf
COUR	RSE OUTCOME	K Level
On the	e successful completion of the course, the students will be able to	
CO1:	Solve linear programming problems by various methods	K3
COL	Analyze different environments that needs decision using duality concepts to	V A
CO2:	find solution.	K 4
CO3:	Develop the solution to Transportation and Assignment Problem	K3
CO4:	Explain the game theory problems	K4
CO5:	Solve replacement and sequencing problem	K3

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	3	2
CO 2	2	2	3	2	3	3
CO 3	2	3	2	2	3	2
CO 4	2	2	2	3	2	2
CO5	3	3	2	2	3	3

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

LESSON PLAN

UNIT	SUBJECT NAME	Hrs	Pedagogy
I	Linear Programming Problem - Mathematical formulation of the problem – Solution by Graphical Method, The Simplex method and Method of penalty (Big M Method only).	15	Chalk & Talk
II	Duality – Dual simplex method- Problems.	15	Chalk & Talk
III	Transportation problem – Mathematical form – Initial solutions by all methods – MODI method for both balanced and unbalanced TP- The assignment problem.	15	Chalk & Talk
IV	Game theory – Two person zero sum game – saddle point – Game with saddle point – Solution of game by using formula, graphical method, method of dominance and LPP method.	15	Chalk & Talk
V	Sequencing – Replacement Problem	15	Chalk & Talk

Course Designed by:

Dr. A. Arivuchelvam, Assistant Professor & Dr, P. Chitradevi, Assistant Professor

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print									
	Articulation Mapping – K Levels with Course Outcomes (COs)									
			Sectio	Section A		Section B		Seation D		
Inte	Cos	K I evel	MC	Qs	Short Ans	swers	Section C	Onen		
rnal	CUS	K Level	No. of.	К -	No. of.	К-	Choice	Choice		
			Questions	Level	Questions	Level	Choice	Choice		
CI	CO1	Upto K3	2	K1&K2	1	K1	2	1		
AI	CO2	Upto K4	2	K1&K2	2	K2	2	1		
CI	CO3	Upto K3	2	K1&K2	1	K2	2	1		
AII	CO4	Upto K4	2	K1&K2	2	K2	2	1		
		No. of					4	2		
		Questions to	4		3					
		be asked								
		No. of								
Que	stion	Questions to	4		3		2	1		
Pat	tern	be answered								
CIA I & II		Marks for	1		2		5	10		
		each question	-				<u> </u>	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	5	20			
	K2	2	4			6	12	20			
СІА	K3			10	10	20	40	40			
I	K4			10	10	20	40	40			
-	Marks	4	6	20	20	50	100	100			
	K1	2	2			4	8	20			
	K2	2	4			6	12	20			
CIA	K 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.

5	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	K -	No. of	K –	No. of	K –	(Either /	(Open	
		Level	Questions	Level	Question	Level	or Choice)	Choice)	
1	CO1	Upto K3	2	K1&K2	1	K1	2(K2&K2)	1(K3)	
2	CO2	Upto K4	2	K1&K2	1	K1	2(K3&K3)	1(K4)	
3	CO3	Upto K3	2	K1&K2	1	K2	2(K2&K2)	1(K3)	
4	CO4	Upto K4	2	K1&K2	1	K2	2(K3&K3)	1(K4)	
5	CO5	Upto K3	2	K1&K2	1	K2	2(K2&K2)	1(K3)	
No.	of Questi	ons to be	10		5		10	5	
	Aske	d	10		5		10	5	
No.	of Questi	ons to be	10		5		5	3	
answered		red	10		5		5	5	
Marks for each question		1		2		5	10		
Total Marks for each		10		10		25	30		
section		n	10		10		23	- 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			9	7.5	12		
K2	5	6	30		41	34.1	42		
K3			20	30	50	41.7	42		
K4				20	20	16.7	16		
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	of K levels.								

Section	A (Mul	tiple Choice	e Questions)
Answer	All Qu	estions	(10x1=10 marks)
Q.No	СО	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 (Shoi	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	K2	
18) b	CO3	K2	
19) a	CO4	K3	
19) b	CO4	K3	
20) a	CO5	K2	
20) b	CO5	K2	
NB: Hig	gher lev	el of perfor	mance of the students is to be assessed by attempting higher level of K
levels			
Section	D (Ope	n Choice)	
Answer	Any Tl	hree questio	ns (3x10=30 marks)
Q.No	CO	K Level	Questions
21	CO1	K3	
22	CO2	K4	
23	CO3	K3	
24	CO4	K4	
25	CO5	K3	

Summative Examinations - Question Paper – Format



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

Course Name	PROGRAMMING IN PHP LAB						
Course Code	21UCSSP4	L	Р	С			
Category	Skill						
Nature of course:	EMPLOYABILITY 🗸 SKILL ORIENTED 🗸 ENTREPRENI	EUR	SHIP	~			
Course objectives:							

Course objectives:

- To understand the principles of creating an effective dynamic web page, including the consideration of information architecture.
- To Understanding of server side scripting with PHP language.
- To develop an ability to design and implement static and dynamic website
- To Learn basics of database driven web applications
- To practice to configure the Apache webserver to run the web applications

S. No.	List of Programs	Hours
1.	Write a PHP Program to display message	
2.	Write a PHP Program to perform Arithmetic Operation	
3.	Write a PHP Program to perform String Operation	
4.	Write a PHP Program to validate Name, Email and Password and display error messages.	
5.	Write a PHP Program to insert a record in MySQL Database.	20
6.	Write a PHP Program to view the record in database	30
7.	Write a PHP Program to sort a record by using Order By clause	
8.	Write a PHP Program to delete and update a record in MySQL	
9.	Write a PHP program to start a PHP Session.	
10.	Write a PHP program to display current date-time.	
11.	Write a PHP Program to perform include Function	
	Total Hours	30
Web Reso	nurces:	

1. https://www.javatpoint.com/php-programs

2.https://www.w3schools.com/php/php_examples.asp

3. https://www.geeksforgeeks.org/php/

COU	IRSE OUTCOMES:	K L ovol			
At the	At the end of the course the students will be able to				
CO1	Defining dynamic web pages with good aesthetic sense of designing and latest technical know-how's.	Upto K2			
CO2	Summarizing various database tasks by applying MYSQL database tool	Upto K2			
CO3	Determining the insights of PHP programming tools and implement complete application over the web.	Upto K2			
CO4	Examining the important PHP functions for designing dynamic web pages and communicate database using MYSQL.	Upto K2			
CO5	Experimenting well-formed web documents and implement web service using apache Web Server	Upto K2			

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	3	1	2	2	2
CO 2	3	2	2	3	2	3
CO 3	1	3	3	2	3	3
CO 4	3	2	2	2	3	2
CO5	2	3	2	3	1	3

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

LESSONPLAN

S. No.	List of Programs	Hrs	Mode
1. 2. 3. 4.	Use of Programs Write a PHP Program to display message Write a PHP Program to perform Arithmetic Operation Write a PHP Program to perform String Operation Write a PHP Program to validate Name, Email and Program of display error messages	Hrs	Niode
5. 6. 7. 8. 9. 10. 11	 Password and display error messages. Write a PHP Program to insert a record in MySQL Database. Write a PHP Program to view the record in database Write a PHP Program to sort a record by using Order By clause Write a PHP Program to delete and update a record in MySQL Write a PHP program to start a PHP Session. Write a PHP program to display current date-time. Write a PHP Program to perform include Function 	30	Black Board, Lab Demonstration and LCD Projector.

Course Designed by : Dr. S. Veerapandi & Dr. S. Shaik Parveen



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

Course Name	WEB DEVELOPMEN	NT					
Course Code	21UCSN41				L	Р	С
Category	Non Major Elective Co	ourse			2	-	2
Nature of Course:	EMPLOYABILITY	SKILL ORIENTED	✓	ENTREPRENE	URS	HIP	
Course Objective	s:						
Understand	the concepts of Internet &	& Networking					
Compreher	d the concepts of Internet	Technologies					
 Apply HTML basic concepts to design a static web site 							
Apply som	e advanced HTML tags to	improve the web appear	ranc	e.			
Understand	the Frame concepts to div	vide the web page			1		
Unit: I INT	ERNET BASICS - I					6 H	ours
Introduction to the Gopher, World W	Internet - Computers in E de Web. Usenet. Telnet. F	Business, Networking, I Bulletin Board Service, V	nter Nide	net, E-mail, Reso e Area Informati	ource	Shar rvice	ing,
Unit: II INT	ERNET BASICS - 2					6 H	ours
Internet Technolo	gies - Modem, Internet	Addressing, Physical	Cor	nections, Telep	hone	Line	es -
Internet Browsers	: Internet Explorer, Netsca	ape Navigator and Goog	le C	hrome			
Unit: III HT	ML - I					6 H	ours
Introduction to H	ML - History of HTML,	HTML Documents, And	chor	Tag, Hyper Lin	ks - l	Head	and
Body Sections - H	eader Section - Title, Prole	ogue, Links, Colorful W	eb F	Page, Comment l	Lines		
Unit: IV HT	ML - 2					6 H	ours
Designing the Boo	ly Section - Heading Prin	ting, Aligning the Head	ling	s, Horizontal Ru	le, Pa	aragra	aph,
Tab Settings, Lists	, Unordered Lists, Ordered	d Lists.			1		
Unit: V HT	ML - 3					6 H	ours
Table Handling	Tables, Tables Creation	in HTML - #Frames	¥ —	Frameset Defi	nitior	n, Fra	ame
Definition, Nested	Framesets.				1		
		То	tal	Lecture Hours		30 H	Irs
Books for Study:				• • • • • • • • • •			
1. C. Xavier, Wol	Id Wide Web Design wit	h HTML, TMH, 19th	кер	rint, 2008.			
	Thepter 1 Sections 1.1 - 1.1	1					
	Chapters A Sections A 1 – 2	4651-56					
UNIT IV ·	Chapters 6 Sections 6.1 –	4.0, 5.1 = 5.0 65, 7.1 = 7.4					
UNIT V :	Chapters 8 Sections $8.1 - 8$	8.3, 10.1 - 10.3					
Books for Refere	ices:						
1 Thomas A F	owell HTML & XHTML	TMH Fourth Edition	Thir	teenth Reprint 2	007		
2. N.P. Gopala	n and J. Akilandeswari, V	Web Technology A Dev	elop	er's Perspective	, PHI	, Sec	ond
Printing, Ju	ıly 2008.	0,	1	1	-	-	
Web Resources:							
1. https://ww	v.w3schools.com/html/						
2. <u>https://edu</u>	<u>gcfglobal.org/en/internet</u>	tbasics/					

Course C	Course Outcomes			
At the end of the course the students will be able to				
CO1:	Remember concepts of Internet Technologies	K2		
CO2:	Know the uses of text formatting tags	K2		
CO3:	Understand usage List and tables tags	K2		
CO4:	Understand the concepts of Table Tags	K2		
CO5:	Understand the usage Frame and Frameset Tags	K2		

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	3	3	3	3	2
CO 2	2	2	3	2	3	3
CO 3	3	2	3	2	3	3
CO 4	3	3	3	3	2	3
CO5	2	2	2	3	2	3

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

LESSON PLAN

Unit	WEB DESIGN	Hrs	Pedagogy
Ι	Introduction to the Internet - Computers in Business, Networking, Internet, E-mail, Resource Sharing, Gopher, World Wide Web, Usenet,	6	Chalk & Talk,
	Telnet, Bulletin Board Service, Wide Area Information Service.		ICT Kit
	Internet Technologies - Modem, Internet Addressing, Physical		Chalk &
II	Connections, Telephone Lines - Internet Browsers : Internet Explorer,	6	Talk,
	Netscape Navigator and Google Chrome.		ICT Kit
	Introduction to HTML - History of HTML, HTML Documents, Anchor		Chalk &
III	Tag, Hyper Links - Head and Body Sections - Header Section - Title,	6	Talk,
	Prologue, Links, Colorful Web Page, Comment Lines.		ICT Kit
	Designing the Body Section - Heading Printing, Aligning the Headings,		Chalk &
IV	Horizontal Rule, Paragraph, Tab Settings, Lists, Unordered Lists,	6	Talk,
	Ordered Lists.		ICT Kit
V	Table Handling Tables, Tables Creation in HTML .Frames, Frameset Definition, Frame Definition, Nested Framesets.	6	Chalk & Talk, ICT Kit

Course Designed by: Mr.S.Veerapandi & Mrs. J. Anitha Gracy



Academic Council Meeting Held On 20.04.2023



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

Course Code 21UCSC51 L P C Category Core 6 - 4 Nature of course: EMPLOYABILITY ✓ SKILL ORIENTED ✓ ENTREPRENURSHIP ✓ Course Objectives: ✓ SKILL ORIENTED ✓ ENTREPRENURSHIP ✓ Course Objectives: ✓ To know the real time usage of JDBC ✓ ENTREPRENURSHIP ✓ To understand basic concepts of servlet and JSP To understand importance of RMI To develop skills to apply to real time environment To get knowledge of Java Annotation Processors and Java Agent Basics I8 Classes and Interfaces: Interfaces – marker Interfaces –Functional interfaces, default and static methods – Abstract classes – Immutable classes – Anonymous classes – Visibility –										
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Classes and Interfaces: Introduction –Interfaces – marker Interfaces –Functional interfaces, default and static methods – Abstract classes – Immutable classes – Anonymous classes – Visibility –										
and static methods – Abstract classes – Immutable classes – Anonymous classes – Visibility –										
Inheritance and Multiple Inheritance – Encapsulation – Final classes and methods.										
Unit: IIMethods and General Programming Guidelines18										
Methods: Method Signatures – Methods body – Method overloading and overriding – Inlining –										
Recursion – Method References – Immutability										
Unit: IIIExceptions & Thread and Thread Groups18										
Exceptions: Exceptions and when to use – Checked and unchecked exceptions – using try –with-										
resources – Exceptions and lambdas – Standard Java exceptions . Threads and Thread Groups –										
Concurrency, synchronization and Immutability										
Unit: IVDynamics Language Support and API18										
Dynamics languages support: Dynamic Languages Support – Scripting API - JavaScript on JVM –										
Groovy on JVM – Ruby on JVM – Python on JVM – Using Scripting API.										
Unit: VJava Annotation Processors and Java Agent Basics18										
Java Compiler API: Java Compiler API – Annotation Processors – Element Scanners – Java										
Compiler Tree API.										
Total Lecture Hours 90 Hrs										
Books for Study:										
1. ANDRIY REDKO ADVANCED JAVA Preparing you for Java Mastery Unit – I - Chapters: 3 - 3.1 to 3.13										

	Unit – II - Chapters: 6 - 6.1 to 6.9							
	Unit – III - Chapters: 8 - 8.1 to 8.6							
	- Chapters: 9 - 9.1 to 9.3							
	Unit – IV - Chapters: 12 - 12.1 to 12.8							
	Unit – V - Chapters: 13 - 13.1 to 13.5							
Books	for References:							
1. Utt	am K. roy " Advanced Java Programming, OXFORD Publishers							
2. A.A. Puntambekar "Advanced Java Programming, TECHNICAL PUBLICATIONS								
Web R	Web Resources:							
1. http	1. https://www.javatpoint.com/advanced-java-books-in-2021							
2. http	s://www.javacodegeeks.com/2015/09/advanced-java.html							
C	0							
Cours	Outcomes							
CO1:	Summarize the classes and Interfaces in advanced JAVA	K3						
CO2:	Develop and understand the methods, Strings and immutability	K3						
CO3:	Apply the concepts of Exceptions and Thread Groups	K3						
CO4:	Implement the Dynamics language support and getting more knowledge of API	K4						
CO5:	Put in practice Java agent and learn a java annotation processors	K4						

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	2	2	3
CO 2	1	3	2	2	3	3
CO 3	3	1	3	2	2	3
CO 4	2	3	2	3	1	3
CO5	2	3	3	2	1	3

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

LESSON PLAN

Unit	Advanced Java Programming	Hrs	Pedagogy
I	Classes and Interfaces: Introduction –Interfaces – marker Interfaces – Functional interfaces, default and static methods – Abstract classes – Immutable classes – Anonymous classes – Visibility – Inheritance and Multiple Inheritance – Encapsulation – Final classes and methods	15	Lecture, Chalk, PPT, ICT
п	Methods: Method Signatures – Methods body – Method overloading and overriding – Inlining – Recursion – Method References – Immutability	15	Lecture, Chalk, PPT, ICT
ш	Exceptions: Exceptions and when to use – Checked and unchecked exceptions – using try –with- resources – Exceptions and lambdas – Standard Java exceptions . Threads and Thread Groups – Concurrency, synchronization and Immutability	15	Lecture, Chalk, PPT, ICT
IV	Dynamics languages support: Dynamic Languages Support – Scripting API - JavaScript on JVM – Groovy on JVM – Ruby on JVM – Python on JVM – Using Scripting API.	15	Lecture, Chalk, PPT, ICT
V	Java Compiler API: Java Compiler API – Annotation Processors – Element Scanners – Java Compiler Tree API	15	Lecture, Chalk, PPT, ICT

Course Designed by: Mr.J.Rajkumar& Dr.S,Veerapandi

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print											
Articulation Mapping – K Levels with Course Outcomes (COs)												
			Sectio	n A	Section	B	Section C	Section D				
Inte	Cos	K Level	MC	Qs	Short Ans	swers	Fither or	Onen				
rnal	005		No. of.	К -	No. of.	К-	Choice	Choice				
			Questions	Level	Questions	Level		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	CO4	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						
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						
CIA	K3	-	-	10	10	20	40	40					
II	K4	-	-	10	10	20	40	40					
	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

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

Summ	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)										
S. No	COs	K - Level	MCC No. of Questions	MCQsShort AnswersNo. ofK –No. ofK –QuestionsLevelQuestionLevel		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 d	10		5		10	5			
No. of Questions to be answered			10		5		5	3			
Marks for each question			1		2		5	10			
Total N	Aarks for	each section	10		10		25	30			
((Figures	in parenthesi	s denotes, qu	estions s	hould be ask	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	4.17	17
K2	5	10	-	-	15	12.5	17
K3	-	-	30	30	60	50	50
K4	-	-	20	20	40	33.33	33
Marks	10	10	50	50	120	100	100
NB: Hig	gher level of p	erformance o	of the students	s is to be asso	essed by a	attempting	higher level
of K lev	els.						

Section A (Section A (Multiple Choice Questions)								
Answer All	l Questi	ions	(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 (Short A	Answers)							
Answer All	l Questi	ions	(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 (Either/	Or Type)							
Answer All	l Questi	ions	(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: Highe	r level o	of perform	ance of the students is to be assessed by attempting higher level of						
K levels									
Section D (Open (Choice)							
Answer A	ny Thre	ee question	s (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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	DATA COMMUNIC	AT	ION AND NETWOR	KI	NG					
Course Code	21UCSC52					L	Р	С		
Category	Core					6	-	4		
Nature of course:	EMPLOYABILITY	~	SKILL ORIENTED	~	ENTREPREN	URSI	HIP	~		
Course Objecti	ves:									
 To introduce the fundamental types of computer networks. To include learning about computer network organization To understand the data communication and computer networks, and gaining practical experience in installation, monitoring, and troubleshooting of current LAN systems. To demonstrate the TCP/IP & OSI model merits & demerits. 										
• To know the role of various protocols in Networking.										
Unit: I Intr	oduction:	[ventre Netroute Truese	D.,,	ate colo and Sta		12)		
Network Model	s: Lavered tasks – The	OS	I Model - TCP/IP Prot	- Pr ocol	otocois and Sta I Suite.	ndard	.s -			
Unit: II Tra	nsmission Media	00		000	i Suite.		15	5		
Transmission Media: Guided media- Unguided media: Wireless-Wireless WANs:-Cellular										
Telephony-Satellite Networks.										
Unit: IIIData Link Layer: Error Detection and Correction:15										
Introduction – B	Block Coding- Linear Bl	ock	Codes- Cyclic Codes.	Co	des – Checksur	m − D	ata L	link		
Control: Framing– Flow and error control-HDLC– Point –To-Point Protocol										
Unit: IV Net	work Layer:						1.)		
Network Layer Routing Protoco	r: IPV4 Addresses- IF ls- Multicast Routing : I	V6 Intro	Addresses - Unicast oduction- Multicast Pro	Ro otoc	uting: Introduo ols-IGMP.	ction-	Uni	cast		
Unit: V Cry	ptography and Network	Sec	urity				15	5		
Cryptography a	and Network Security	: In	troduction-Symmetric	key	Cryptography	- Asy	ymme	etric		
key Cryptograph	ny, Security Services-Me	essa	ge Confidentiality.	T		r	76			
Deelee feer Cteele				10	tal Lecture Ho	urs	15			
 Books for Study: 1. Behrouz A.Forouzan, Data Communications and Networking, TataMcGraw Hill Education Private Limited, New Delhi, Fourth Edition, 2007. Unit I : Chapter 1 – 1.1, 1.2, 1.4 Chapter 2 –2.1- 2.2,2.4 Unit II : Chapter 7 – 7.1,7.2,7.3 Chapter 16 –16.2,16.3 Unit III : Chapter 10 –10.1-10.5 Chapter 11 –11.1-11.2,11.6,11.7 Unit IV : Chapter 19- 19.1,19.2,Chapter 22- 22.3-22.4 Chapter 21- 21.3. Unit IV : Chapter 30, 30,1,30,2,30,3 Chapter 31, 31, 1, 21, 2 										
Books for Refer	rences:		-							
 Andrew S.T 2014. PrakashC.Gu 	'anenbaum, Computer N upta, Data Communicat	Vetv	vork, Prentice Hall of s & Computer Netwo	Ind rks,	ia, New Delhi, Prentice Hall	Fifth of Inc	Edit dia, N	ion, New		
Delhi, Third	Edition, 2006.									

3.	William	Stallings,	Data	and	Computer	Communications,	Prentice	Hall	of	India,	New
	Delhi, S	eventh Edit	ion, 200)4.							
We	b Resou	rces:									
1.	https://v	<u>www.journ</u>	als.elsev	vier.	com/compu	<u>iter-networks</u>					
2.	2. https://www.tutorialspoint.com/computer_fundamentals/computer_networking.html										
3.	https://v	www.guru9	9.com/	types	s-of-compu	<u>ter-network.html</u>					
Course Outcomes									K Le	evel	
CO	Explain about building blocks of Computer Network, Components and								V	2	
CU	Trar	nsmission m	nedia.							n.	3
CO	Den	Demonstrate the Functionalities and Protocols in the layers of ISO/OSI							K	2	
	Netv	work Model	l.							n.	3
CO	3: Mak	te use of the	e Data li	ink la	yer protoco	ls in Error detection	and corre	ection.		K	3
	App	ly Suitable	Routing	g Stra	ategies for a	given network and	choose ap	propri	ate		
CO	4: acce	ss control,	congest	ion c	ontrol and c	ongestion avoidanc	e techniqu	e for		K	4
	give	n Traffic sc	enario								
CO	Asse	Assess the functions of Application layer Paradigms and Protocols and design								V	1
	for t	he real time	e applica	ation	s.					N	4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	2	2	2	3	3
CO 2	2	2	2	2	3	3
CO 3	3	1	2	3	2	3
CO 4	2	3	2	3	1	3
CO5	3	3	2	2	1	3

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

UNIT	Data Communication and Networking	Hrs	Mode
I	Introduction: Data communications– Networks –Network Types– Protocols and Standards - Network Models: Layered tasks – The OSI Model - TCP/IP Protocol Suite.	15	Lecture, Chalk, PPT, ICT
п	Transmission Media: Guided media- Unguided media: Wireless- Wireless WANs:–Cellular Telephony-Satellite Networks.	15	Lecture, Chalk, PPT, ICT
III	Introduction – Block Coding- Linear Block Codes- Cyclic Codes. Codes – Checksum – Data Link Control: Framing– Flow and error control- HDLC– Point –To-Point Protocol	15	Lecture, Chalk, PPT, ICT
IV	Network Layer: IPV4 Addresses- IPV6 Addresses - Unicast Routing: Introduction- Unicast Routing Protocols- Multicast Routing: Introduction- Multicast Protocols-IGMP.	15	Lecture, Chalk, PPT, ICT
V	Cryptography and Network Security: Introduction–Symmetric key Cryptography - Asymmetric key Cryptography, Security Services- Message Confidentiality.	15	Lecture, Chalk, PPT, ICT

LESSON PLAN

Course Designed by: Dr.S.Veerapandi & Mr.J.Rajkumar

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
Inte rnal	Cos	os K Level		n A Qs K-	Section B Short Answers		Section C Either or	Section D Open
			Questions	Level	Questions	Level	Choice	Choice
CI	CO1	K3	2	K1,K2	1	K2	2(K3,K3)	2(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	CO4	K4	2	K1,K2	2	K2	2(K4,K4)	2(K4)
		No. of Questions to be asked	4		3		4	3
Question Pattern CIA I & II	estion tern	No. of Questions to be answered	4		3		2	2
	1 & 11	Marks for each question	1		2		5	20
		Total Marks for each section	4		6		10	20

	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	6	17
	K2	2	4	-	-	6	11	
СІА	K3	-	-	20	30	50	50	83
I	K4	-	-	-	-	-	-	-
-	Marks	4	6	20	30	60	100	100
	K1	2	2	-		4	6	17
	K2	2	4	-	-	6	11	
CIA	K 3	-	_	10	10	20	33.33	33
II	K4	-	_	10	20	30	50	50
	Marks	4	6	20	30	60	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.

Summ	Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes							
				(COs)	1			
			MCC)s	Short An	swers	Section C	Section D
S No	COs	K - Lovol	No of	K	No. of	K	(Either /	(Open
5.110	COS	IX - Level	Augustians	I ovol	And the first of t	I ovol	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	K1 K7	5	K)	10	5
	Aske	d	10	К1,К 2	3	N2	10	3
No. of Questions to be		ions to be	10	K1 K7	5	K)	5	3
	answei	red	10	K1,K2	3	N 2	5	5
Marl	ks for eac	h question	1	K1,K2	2	K2	5	10
Total N	Aarks for	each section	10	K1,K2	10	K2	25	30
	(Figures	in parenthesi	s denotes, qu	estions s	hould be ask	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	gher level of p	erformance o	of the student	s is to be asso	essed by a	attempting	higher level	
of K lev	els.							

Section A (Multip	le Choice (Questions)
Answer All	Questi	ions	(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 (Short A	(Inswers)	
Answer Al	Questi	ions	(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 (Either/	Or Type)	
Answer All	Questi	ions	(5 x 5 = 25 marks)
Q. No	CO	K Level	Questions
16) a	CO1	K3	
16) b	COl	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	<u>CO5</u>	K4	
NB: Highe	r level (of perform	ance of the students is to be assessed by attempting higher level of
K levels	0 (• •	
Section D (Open C	(hoice)	(210, 20,
Answer An	y inre	e questions	(3X10=30 marks)
Q. INO	CO1	K Level	Questions
21	CO1	KJ V2	
22	CO_2	KJ K2	
23	CO_{4}	KA KA	
24 25	C04	<u></u> <u> </u>	
23	003	N 4	

Summative Examinations - Question Paper – Format



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

Cours Name	se	JAVA	A PROGRAMMING	LAI	}					
Cours	se Code	21U0	CSCP5					L	Р	C
Categ	ory	Core						-	6	4
Natur	e of cou	rse:	EMPLOYABILITY	✓	SKILL ORIENTED	\checkmark	ENTREPRENURS	SHI	P	✓
Cours	se object	tives:					I			
• • • •	To know To unde To unde To deve Students	v the re erstand erstand lop ski s will b	eal time usage of JDBC basic concepts of serv importance of RMI ills to apply to real time be able to Facilitates ex	C let a e env aperi	nd JSP vironment ential learning.					
S. No.	A Duran]	List	of Programs				Ηοι	ırs
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.	A Progra A progra A progra A progra A progra A progra Impleme Write a J foregrou Write a J Write a J Write a J Write a J write a J company write a J them in 7	e servlet am which am for h am for h am to di am to di am to ge am on S ent an A Java pro Java pro Java pro Java pro Java pro Java pro Java pro Java pro Java pro Java pro	t that just generates plain ch displays cookie id pasic arithmetic functions isplay a String using JSP enerates plain text using a stock Market using RMI application that creates y- bogram to create an Apple backgrounds. ogram to create an applet ogram to create buttons w program to create a simp ogram to create a bean the gram to implement a JLie ea	Java Java Java our S t that t that t key vith c le sen at dis	ng JSP Beans Gerver using RMI t displays student informa scrolls a message from 1 event handlers different borders? rvlet and test it? splay employee name, sa here we can select multip	atior eft to lary, le co	n and also set o right? , designation and purses and display		9(0
							Total Hours			90
Books Web 1. 2. 3.	for Refe 1. 5 Resourc <u>https://v</u> <u>https://v</u>	es: www.j www.g www.y	s: iKakar " Java Program avatpoint.com/java-t geeksforgeeks.org/java/java/java/java/java/java/java/jav	utor a/ iva	g", WILEY Edition ial getstarted.asp					

Course	Course Outcomes			
CO1:	Infer the concepts of JDBC.	K3		
CO2:	Summarizing the knowledge of JSP and Java Beans	K3		
CO3:	Use the concepts of RMI and its important.	K3		
CO4:	Sketch the concepts of Jilts and make good programming skills	K3		
CO5:	Implement the concept of java and applying real time environment	K4		

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	1	3
CO 2	2	3	2	2	2	3
CO 3	2	2	3	2	2	3
CO 4	2	2	1	3	3	3
CO5	2	3	2	1	3	3

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

LESSONPLAN

S. No.	Java Programming Lab	Hours	Mode
	A Program to execute select query using JDBC		
1.	A simple servlet that just generates plain text		
2.	A Program which displays cookie id		
3.	A program for basic arithmetic functions using JSP		
4.	A Program to display a String using JSP		
5.	A program to generates plain text using Java Beans		
6.	A Program on Stock Market using RMI		
7.	Implement an Application that creates your Server using RMI		Lab
8.	Write a Java program to create an Applet that displays student information		Lau
9.	and also set foreground and backgrounds.	90	and I CD
	Write a Java Program to create an applet that scrolls a message from left		and LCD Projector
10.	to right?		riojecioi.
11.	Write a Java program to demonstrate the key event handlers		
12.	Write a Java program to create buttons with different borders?		
13.	Write a servlet program to create a simple servlet and test it?		
14.	Write a Java program to create a bean that display employee name, salary,		
	designation and company?		
15.	write a Java program to implement a JList where we can select multiple		
	courses and display them in Text area		
	Total Hours	90	

Course Designed by: Mr.J.Rajkumar& Dr.S,Veerapandi



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

Course Name	OPERATING SYSTEM CONCEPTS			
Course Code	21UCSE51	L	Р	С
Category	Core Elective	5	-	5
Nature of course:	EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPRENU	RSH	IP	\checkmark
Course Objective	es:			
• To learn a	basic knowledge of Advanced operating systems,			
To provide	e the users a convenient interface to use the computer system.			
• To gain kr	nowledge on Distributed operating system concepts that includes arc	hitect	ure	
• To act as a	an intermediary between the hardware and its users			
• To make t	he users easier to access and use other resources.			
Unit: I Intro	duction and Design approaches		15	,
Introduction: Ad	lvanced Operating System – Function of an Operating Syste	em: 1	Resou	ırce
Management -Use	er friendliness – Design Approaches: Layered Approach			
Unit: II Type	es of Advanced Operating System		15	,
Types of Advar	nced Operating Systems: Distributed and Multiprocessor operation	ng sy	/stem	s –
Database and Rea	ll-time operating system			
Unit: III Proc	ess and Critical Section		15	,
Concept of a Proc	cess – Process Life Cycle – Serial Processes – Concurrent processes	- the	e Crit	ical
Section Problem:	Critical Section – A solution to the problem of mutual exclusion – S	lemap	ohore	
Unit: IV Othe	er Synchronization Problems		15	,
Other Synchroniz	zation Problems: Monitor - Characteristics of monitors – Advantages	s Mor	nitors	-
Serializer – Moni	tors vs Serializers. Path Expressions: Sequencing – Selection – Cond	currer	ncy.	
Unit: V Distr	ibuted Operating System and Remote Procedure Call		15	,
Distributed Opera	ating System: Architecture of a Distributed Systems – Issues in Distr	ibute	d	
Operating System	n – The message passing model – Remote Procedure Call.			
	Total Lecture Ho	urs	75 H	rs
Books for Study				
1.MukeshSinghal	and Niranjan G. Shivaratri, "Advanced Concepts in Operatin	g Sy	vstem	s –
Distributed, Datal	base, and Multiprocessor Operating Systems", Tata McGraw-Hill, 20	001.		
Books for Refere	ences:			
1. I.A.Dhotre	e "Advanced Operating Systems" TECHNICAL PUBLICATIONS			
2. MUKESH	I SINGHAL & NIRANJAN G. SHIVARATRI "Advanced Concept	s in C)pera	ting
Systems",	Indian Edition			
Acadamic Co	uncil Meeting Held On 20 04 2023	Dr	0 000	 ■ 1

Web F	Resources:	
1.ht	ttps://www.geeksforgeeks.org/operating-systems/ https://www.javatpoint.com/latest-operating-systems	
Cours	e Outcomes	K Level
C01:	Describe the general architecture of computers	K Level K3
CO2:	Describe the structures for operating systems	К3
CO3:	Analyze theory and implementation of processes	К3
CO4:	Understand the high level structure of concepts	K4
CO5:	Understand and get more knowledge of Distributed Operating system and Remote Procedure Call	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	2	3	2	3	3
CO 2	2	3	2	2	2	3
CO 3	3	3	2	2	1	3
CO 4	3	2	3	1	2	3
CO5	2	2	3	2	2	3

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

LESSON PLAN

Unit	Operating System Concepts	Hrs	Pedagogy
Ι	Introduction: Advanced Operating System - Function of an Operating	15	Chalk
	System: Resource Management -User friendliness – Design Approaches:		&Talk,
	Layered Approach		ICT Kit
II	Types of Advanced Operating Systems: Distributed and Multiprocessor	15	Chalk
	operating systems – Database and Real-time operating system		&Talk,
			ICT Kit
III	Concept of a Process - Process Life Cycle - Serial Processes -	15	Chalk
	Concurrent processes - the Critical Section Problem: Critical Section -		&Talk,
	A solution to the problem of mutual exclusion – Semaphore		ICT Kit
IV	Monitor - Characteristics of monitors - Advantages Monitors -	15	Chalk &
	Serializer – Monitors vs Serializers.		Talk,
			ICT
			Kit
V	Distributed Operating System: Architecture of a Distributed Systems -	15	Chalk &
	Issues in Distributed Operating System - The message passing model -		Talk,
	Remote Procedure Call		ICT Kit

Course Designed by: Mr.J.Rajkumar & Dr.S. Veerapandi

	Learning Outcome Based Education & Assessment (LOBE)									
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section A		Section	B	Section C	Section D		
Inte	Cos	K L evel	MC	Qs	Short Ans	swers	Fither or	Onen		
rnal	CUS	K Level	No. of.	K -	No. of.	К -	Choice	Choice		
			Questions	Level	Questions	Level	Choice	Choice		
CI	CO1	Up to K3 2 K1,K2 1 K2		2(K3,K3)	1(K3)					
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	CO4	Up to 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			
	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)	on BSection CSection Dort(Either /(OpenwerOrChoice)ions)Choice)		Total Marks	% of (Marks without choice)	Consolidate of %		
	K1	2		-	-	2	4	20		
CIA	K2	2	6	-	-	8	16			
	K3	-	-	20	20	40	80	80		
I	K4	-	-	-	-	-				
	Marks	4	6	20	20	50	100	100		
	K1	2		-	-	2	4	20		
CIA	K2	2	6	-	-	8	16			
II	K3	-	-	10	10	20	40	40		
	K4	-	-	10	10	20	40	40		
	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

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	MCQ)s	Short An	swers	Section C	Section D		
			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	tions to be	10		5		10	5		
	Aske	ed	10		5		10	5		
No	. of Quest	tions to be	10		E		=	2		
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	is denotes, qu	estions s	hould be as	ked 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					
	Questions)	Questions)				choice)					
K1	5		-	-	5	4.17	17				
K2	5	10	-	-	15	12.5	17				
K3	-	-	30	30	60	50	50				
K4	-	_	20	20	40	33.33	33				
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 (Multip	le Choice (Questions)
Answer All	l Questi	ions	(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 (Short A	(Inswers)	
Answer All	Questi	ions	(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 (Either/	Or Type)	
Answer All	Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer A	ny Thre	ee question	as (3x10=30 marks)
Q.No	CO	K Level	Questions
21	CO1	K3	
22	CO2	K3	
23	CO3	K3	
24	CO4	K4	
25	CO5	K4	



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

Course Name	SOFTWARE ENGIN	IEF	CRING								
Course Code	Code 21UCSE52										
Category	Core Elective					5	-	5			
Nature of cours	e: EMPLOYABILITY	✓	SKILL ORIENTED	✓	ENTREPRENU	URSHIP 🗸		✓			
Course Objectives:											
• To understand the nature of software development and software life cycle process models,											
agile softwa	are development, SCRU	Ma	and other agile practice	s.							
• To explain	methods of capturing, sp	peci	fying, visualizing and a	anal	lyzing software	requi	reme	nts.			
 To underst 	and concepts and prin-	cipl	es of software design	an	d user-centric	appro	bach	and			
principles of	f effective user interfact	es.									
To know th	e basics of testing and u	inde	erstanding the concept of	of s	oftware quality	assur	ance	and			
software co	nfiguration managemen	t pr	ocess.								
• To gain the	knowledge of how Ana	lysi	s, Design, Implementat	tion	, Testing and M	lainte	nance	2			
Processes are co	nducted in a software pr	roje	ct.				<u> </u>				
Unit I Inti		1:	5								
The Evolving ro	le of Software – Softw	are	 The changing Nature 	e of	Software – Leg	gacy s	softw	are.			
A Generic Viev	of Process: Software	Eng	ineering-A Process fra	mey	work-The Capal	oility	Matu	rity			
Model Integrat	on (CMMI)-Process	Mo	dels: Prescriptive Mo	ode	ls -The Water	fall I	Mode	1 –			
Incremental Pro	cess Models-Evolution	ary	Process Models.								
Unit II Req	uirements Engineering	g:					15	,			
Requirements e	ngineering tasks – Ini	tiat	ing the requirements	En	gineering Proce	ess- I	Elicit	ing			
Requirements -	Negotiating Requirem	ents	s – Validating Require	eme	ents. Building	the A	Analy	'sis			
Models –Requi	rement analysis-Scenar	io-E	Based Modeling- Flow	-01	riented Modelin	ng-Cre	eating	g a			
Behavioral Mod	el.										
Unit:III Des	ign Engineering:						15	,			
Design Process	and Design Qualit	y-D	esign Concepts-The	De	esign Model.	Crea	ting	an			
Architectural 1	Design: Software Arch	itec	ture-Data Design-Arcl	hite	ctural Design-N	Mappi	ing I)ata			
Flow into a Soft	ware Architecture.										
Unit:IV Tes	ting Strategies:						15	;			
A strategic appr	oach to Software Testin	ig-T	est strategies for Conve	enti	ional Software-	Valid	ation				
testing –System	testing – Testing Tactic	s: S	Software Testing fundar	ner	ntals- Black-box	and	White	9			
Box Texting-,W	hite Box Testing, Basic	Pat	h testing-Control Struc	ture	e Testing-Black	Box '	Testii	ng.			
Unit:V Estimation:								,			
Estimation: O	oservations on Estima	ntion	n-Resource-Software P	roje	ct Estimation-I	Decon	nposit	ion			
Techniques-Empirical Estimation Models-Quality Management: Quality Concepts-Software Quality											
Assurance – Software Reviews-Formal Technical Reviews.											
Total Lecture Hours 75 Hrs											
Books for Stud	7:										
1. R.S. Pressm	an, Software Enginee	ring	g: A Practitioner's App	pro	ach, McGraw H	Hill E	duca	tion			
(India) Priva	te Limited, Sixth Editio	n, N	New Delhi, 2010.	-	-						
Unit I: Chapter 1-Section 1 1-1 4											

Chapter 2 - Section 2.1-2.3,
	Chapter 3- Section 3.1-3.4								
Unit II	: Chapter 7- Section 7.2-7.4,7.7,7.8,								
	Chapter 8- Section 8.1,8.5, 8.6, 8.8								
Unit II	I: Chapter 9- Section 9.2-9.4,								
	Chapter 10- Section 10.1,10.2,10.4,10.6								
Unit I	V: Chapter 13- Section 13.1, 13.3, 13.5, 13.6,								
	Chapter 14- Section 14.1-14.6								
Unit V	: Chapter 15- Section 15.1,15.3-15.7								
	Chapter 23- Section 23.1,23.4-23.7								
Books	for References:								
1.	Richard Fairley, SoftwareEngineering, Tata McGraw Hill, 2016								
2.	Ian Sommerville, Software Engineering, 8th Edition, Pearson Education, 2008.								
3.	Software Engineering principles and practice- Waman S Jawadekar, The Mc	Graw-Hill							
	Companies, 2007.								
Web F	Resources:								
1.	https://www.geeksforgeeks.org/software-engineering/								
2.	https://www.guru99.com/software-engineering-tutorial.html								
3.	https://www.tutorialride.com/software-engineering/software-engineering-tu	torial.html							
Course	e Outcomes	K Level							
001	Explain about software engineering life cycle and process model in software	17.3							
COI:	development.	K3							
CO2:	Prepare the SRS, Design document, Project plan of a given software system.	K3							
002	Apply Project Management and Requirement analysis, Principles to S/W	IZ 2							
003:	project development.	К3							
CO4.	Analyze the cost estimate and problem complexity using various estimation	TZ A							
CU4:	techniques	K 4							
COL	Assess SQA in software projects through various testing strategies with	V A							
005:	product metrics.	K 4							

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	1	2	2	3	3
CO 2	2	2	3	2	2	3
CO 3	2	1	3	3	2	3
CO 4	2	3	2	2	2	3
CO5	1	3	2	2	3	3

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

LESSON PLAN

Unit	Software Engineering	Hrs	Pedagogy
I	Introduction to Software Engineering : The Evolving role of Software Software, The changing Nature of Software Legacy software A Generic View of Process : Software Engineering A Process framework The Capability Maturity Model Integration (CMMI) Process Models : Prescriptive Models, The Waterfall Model , Incremental Process Models, Evolutionary Process Models.	15	Chalk & Talk, ICT Kit
п	Requirements Engineering: Requirements engineering tasks, Initiating the requirements Engineering Process, Eliciting Requirements, Negotiating Requirements, Validating Requirements. Building the Analysis Models –Requirement analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Creating a Behavioral Model.	15	Chalk & Talk, ICT Kit
III	Design Engineering : Design Process and Design Quality, Design Concepts-The Design Model, Creating an Architectural Design : Software Architecture, Data Design-Architectural Design, Mapping Data Flow into a Software Architecture.	15	Chalk & Talk, ICT Kit
IV	Testing Strategies: A strategic approach to Software Testing, Test strategies for Conventional Software, Validation testing, System testing Testing Tactics: Software Testing fundamentals, Black-box and White Box Texting, White Box Testing, Basic Path testing, Control Structure Testing, Black Box Testing.	15	Chalk & Talk, ICT Kit
V	Estimation: Observations on Estimation-Resource-Software Project Estimation-Decomposition Techniques-Empirical Estimation Models- Quality Management: Quality Concepts-Software Quality Assurance – Software Reviews-Formal Technical Reviews.	15	Chalk &Talk, ICT Kit

Course Designed by: Dr.S.Veerapandi &Mr.J.Rajkumar

	Learning Outcome Based Education & Assessment (LOBE)										
Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)											
			Sectio	on A	Section	B	Section C	Section D			
Inte	Cos	K Level	MC	Qs	Short Ans	swers	Fither or	Onen			
rnal	0.05	K Level	No. of.	К-	No. of.	К-	Choice	Choice			
			Questions	Level	Questions	Level	Choice	Choice			
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO4	Up to 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					
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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	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

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										
			MCC	utcomes ()s	(COs) Short An	swers	Section C			
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 as	ked 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						
	Questions)	Questions)				choice)						
K1	5		-	-	5	4.17	17					
K2	5	10	-	-	15	12.5	17					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	33.33	33					
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 (Multip	le Choice (Questions)
Answer All	Questi	ions	(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 (Short A	(Inswers)	
Answer All	Questi	ions	(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 (Either/	Or Type)	
Answer All	Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer A	ny Thre	ee question	(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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	OBJECT ORIENTE	D A	NALYSIS AND DES	IGI	N							
Course Code	21UCSE53					L	Р	С				
Category	Core Elective					5	-	5				
Nature of cours	ENTREPRENU	J RSH	IP									
Course Objectives:												
To understand the Object-based view of Systems												
• To introduce various designing techniques and methods for object oriented												
• To give	clear idea on implement	ing	design with UML diag	ram	- L							
To incul	cate necessary skills to l	nanc	lle complexity in softw	are	design							
To perfo	rm analysis with real tir	ne s	ystem		0							
Unit: I OV	ERVIEW		5				15	5				
An overview -	Object basics- Object	ts-A	Attributes- Object stat	e a	nd properties	– Be	havic	or –				
Methods – Mes	sages – Encapsulation a	ind	Information hiding – (Clas	s hierarchy – P	olym	orphi	sm-				
Object Relati	onships and Associat	ions	s – Aggregations- A	dva	unced Topics	_	Softv	vare				
Development Pr	ocess-Building a High (Jua	lity Software.		1							
Unit: II ME	THODOLOGY AND	<u>)</u> UM	IL T				15	5				
Introduction – S	Survey – Rumbugh, Boo	och.	Jacobson methods –U	nifie	ed Approach – I	Introd	uctio	n to				
Unified Modelin	ng Language - UML di	iagr	ams – Class Diagram	– U	Jsecase Diagrar	ns –	Dyna	mic				
Modeling		υ	C		U		5					
Unit: III OB	JECT ORIENTED AN	IAL	ANSIS				15	;				
Identifying Us	ecase – Business Obj	ect	Analysis - Usecase	Mo	del – Develor	oing	Effec	tive				
Documentation	– Classification: App	roac	ches for Identifying (Clas	ses-Noun Phra	.se A	pproa	ach-				
Common Class	Pattern Approach-Class	es, l	Responsibilities and Co	llat	orators		11					
Unit: IV OB	JECT ORIENTED DE	SIC	GN				15	5				
Object Oriente	d Design Process – O	bjec	t Oriented Design Ax	tion	s – Corollaries	s – D) esigi	ning				
Classes: The Pr	rocess- Class Visibility	– R	efining Attributes –De	sigr	ning Methods a	nd Pr	otoco	ols –				
Object Store an	d Persistence – Object	Ori	ented Database Manag	em	ent Systems –	User	Inter	face				
Design as a Crea	ative Process- Designing	g Vi	ew Layer Classes.		J							
Unit: V SO	FTWARE QUALITY		2				15	5				
Quality Assurat	nce Tests– Testing Strat	egie	es – Object Orientation	Tes	ting – Test case	es – T	est P	lan				
– Continuous Te	esting- Myer's Debuggii	ng p	orinciples - Usability tes	sting	g – User Satisfa	ction	Test					
	0,00	01	1 2	To	tal Lecture Ho	urs	75H	rs				
Books for Stud	v:											
1.Ali Bahrami, '	Object Oriented Systen	n De	evelopment", McGraw	Hil	International E	ditio	n, 200)9				
Books for Refe	rences:		1 /				,					
1.Craig Larman.	Applying UML and Pa	tter	ns, 2nd Edition, Pearso	n, 2	002.							
E .			, , ,	í								
2.Grady Booch, Addison Wesle	James Rumbaugh, Ivar y Long man, 1999.	Jac	cobson, "The Unified N	/lod	eling Language	Useı	: Gui	de",				
3.Bernd Bruegg	e, Allen H. Dutoit, Ob	ject	Oriented Software Er	igin	eering using U	ML,	Patt	erns				
and Java, Pearso	on 2004											
1												

Web F	Web Resources:							
1.	https://www.geeksforgeeks.org/object-oriented-analysis-and-design/							
2.	https://www.tutorialspoint.com/object_oriented_analysis_design/index.htm							
3.	https://www.youtube.com/watch?v=m1M8H0jK9Cw							
Course	e Outcomes	K Level						
CO1:	Design and implement software employing the principles of encapsulation, information hiding, abstraction, and polymorphism,	K3						
CO2:	Ability to abstract object-based views for generic software systems.	К3						
CO3:	Ability to deliver robust software components	K3						
CO4:	Use frameworks, classes, and methods from standard libraries in problem solutions,	K4						
CO5:	Ability to analyze and model software specifications.	K4						

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	2	3	2	3	3
CO 2	3	2	2	2	2	3
CO 3	2	3	1	2	2	3
CO 4	1	2	2	3	3	3
CO5	2	2	3	2	2	3

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

Unit	Object Oriented Analysis and Design	Hrs	Pedagogy
I	OVERVIEW : An overview – Object basics- Objects-Attributes- Object state and properties – Behavior – Methods – Messages – Encapsulation and Information hiding – Class hierarchy – Polymorphism- Object Relationships and Associations – Aggregations- Advanced Topics – Software Development Process-Building a High Quality Software.	15	Chalk & Talk, ICT Tool
II	METHODOLOGY AND UML Introduction – Survey – Rumbugh, Booch, Jacobson methods –Unified Approach – Introduction to Unified Modeling Language - UML diagrams – Class Diagram – Usecase Diagrams – Dynamic Modeling.	15	Chalk & Talk, ICT Tool
ш	OBJECT ORIENTED ANALYSIS Identifying Usecase – Business Object Analysis - Usecase Model – Developing Effective Documentation – Classification: Approaches for Identifying Classes- Noun Phrase Approach-Common Class Pattern Approach-Classes, Responsibilities and Collaborators	15	Chalk & Talk, ICT Tool
IV	OBJECT ORIENTED DESIGN Object Oriented Design Process – Object Oriented Design Axions – Corollaries – Designing Classes: The Process- Class Visibility – Refining Attributes –Designing Methods and Protocols – Object Store and Persistence – Object Oriented Database Management Systems – User Interface Design as a Creative Process- Designing View Layer Classes.	15	Chalk & Talk, ICT Tool
V	SOFTWARE QUALITY: Quality Assurance Tests– Testing Strategies – Object Orientation Testing – Test cases – Test Plan – Continuous Testing- Myer's Debugging principles - Usability testing – User Satisfaction Test	15	Chalk & Talk, ICT Tool

Course Designed by: Dr.G.Devika & Mrs.S.Amutha

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print									
	-	Articulation	Mapping – K	K Levels wi	th Course Ou	itcomes	(COs)			
			Sectio	on A	Section	B	Section C	Section D		
Inte	Cos	K I ovol	MC	Qs	Short Ans	swers	Fither or	Open		
rnal	CUS	K LEVEI	No. of.	K -	No. of.	К-	Choice	Choice		
			Questions	Level	Questions	Level	Choice	Choice		
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	CO4	Up to 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				
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				
CIA	K3	-	_	10	10	20	40	40			
II	K4	-	-	10	10	20	40	40			
	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

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										
			MCQs		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 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	4.17	17				
K2	5	10	-	-	15	12.5	17				
K3	-	-	30	30	60	50	50				
K4	-	-	20	20	40	33.33	33				
Marks	10	10	50	50	120	100	100				
NID TT											

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

Section A (Multiple Choice Questions)						
Answer All	l Questi	ions	(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 (Short A	Answers)				
Answer All	l Questi	ions	(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 (Either/	Or Type)				
Answer All	l Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of			
K levels						
Section D (Open (Choice)				
Answer An	y Thre	e question	s (3x10=30 <u>marks</u>)			
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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	CYBER SECURITY							
Course Code	21UCSE54	L	Р	С				
Category	Elective	5	-	5				
Nature of cours	e: EMPLOYABILITY 🖌 SKILL ORIENTED 🖌 ENTREPRENU	RSH	IP	✓				
Course Object	ives:							
• To intro	duce the Essentials of Cyber Security.							
• To unde	rstanding of cyber crime wireless devices.							
• To analy	ze the security in Digital devices, tools and techniques for cyber secur	ity.						
• Discuss	the fundamental ideas of public-key cryptography.	-						
• To under	stand the legal perspectives of cyber crime and its organization implic	ation	s.					
Unit: I Int	oduction To Cyber Crime	15	Hou	rs				
Introduction to	Cybercrime - Introduction. Cybercrime: Definition and Origins	of the	e Wo	ord-				
Cybercrime and	Information Security- Who are Cybercriminals? - Classifications of	Cybe	ercrin	nes-				
Cybercrime: Tl	ne Legal Perspectives-Cybercrimes: An Indian Perspective-Cyberc	rime	and	the				
Indian ITA 200	0-A Global Perspective on Cybercrimes-Cybercrime Era: Survival M	Mantr	a for	the				
Netizens.								
Unit: II Cy	ber Crime :Mobile and Wireless Devices	15	Hou	rs				
Introduction –	Proliferation of Mobile and Wireless Devices -Trends in Mobility	y-Cre	dit C	Card				
Frauds in Mob	ile and Wireless Computing Era-Security Challenges posed by Mo	bile	Devi	ces-				
Authentication	Service Security-attacks on Mobile /Cell phones -Mobile Devi	ices:	Secu	rity				
Implications for	Organizations.							
Unit: III Cy	bercrimes and Cyber security : The Legal Perspectives	15	Hou	rs				
Introduction –P	roxy servers and Anonymizers – Phishing –Password Cracking- Virus	and '	Worn	ns –				
Trojan Horses	and Backdoors-Dos and DDos Attacks-SQL Injection -Attacks	on	Wire	less				
Networks.								
Unit: IV Cy	bercrimes and Cyber security : The Legal Perspectives	15	Hou	rs				
Introduction-W	hy do we need cyber laws-The Indian IT Act-Challenges to Ind	lian I	Law	and				
Cybercrime Sc	enario in India- Digital Signatures and the Indian IT Act-Cybe	er cr	ime	and				
Punishment –C	yber law, Technology and students: Indian Scenario. Understandi	ing C	Comp	uter				
Forensics: Intr	oduction – Digital Forensics Science-Cyberforensics and Digit	al E	vider	nce-				
Challenges in C	omputer Forensics- Special Tools and Techniques.							
Unit: V Cy	ber Security : Organizational Implications	15	Hou	rs				
Introduction-C	ost of Cybercrimes and IPR issues –Security and Privacy implication	ns fro	om cl	oud				
computing-Soci	al Media Marketing –Protecting People's Privacy in Organizatio	on –	Incid	lent				
Handling – Med	ia and Asset Protection-importance of endpoint security in Organization	ons.						
Cybercrime: I	Cybercrime: Illustrations, Examples and Mini-cases: Introduction-Real life Examples- Mini-							
cases-Illustratio	ns of Financial Frauds in Cyber Domain-Digital Signature R	elated	ı Cr	ıme				
Scenarios.		T	<i>नट</i> 11					
Doolse for St	Total Lecture Ho	urs	/5 H	rs				
DOOKS for Stud	y:							
1. 1	Vina Godbole and Sunit Belapore: "Cyber Security: Understanding (Cvber	Crin	nes.				

Computer Forensics and Legal Perspectives", Wiley Publications, 2011.

Books	for References:					
1.Cy	ber Security Essentials 2011 – James Graham, Richard Howard and Ryan Olson	-Auerbach				
Pul	plications, CRC press, 2011.					
2.Cy	ber Crime Impact in the New Millennium, by R. C Mishra, Auther Press. Edition	2010.				
3.Cy	ber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant	Publishers.				
4. Ne	twork Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition,	Wiley India				
Pvt	. Ltd					
Web R	Resources:					
1. <u>htt</u>	ps://www.uou.ac.in/sites/default/files/slm/Introduction-cyber-security.pdf					
2. <u>htt</u>	ps://www.lkouniv.ac.in/site/writereaddata/siteContent/202004131505182050s	anjana_m				
	law_IPR_and_Cyber_law.pdf					
3. <u>htt</u>	ps://mrcet.com/pdf/Lab%20Manuals/IT/CYBER%20SECURITY%20(R18A	<u>(0521).pdf</u>				
4. <u>htt</u>	ps://www.drishtiias.com/pdf/1591476911-cyber-security.pdf					
5. <u>httr</u>	os://www.cybok.org/media/downloads/CyBOK-version-1.0.pdf					
Course	e Outcomes	K Level				
CO1:	Know the sources of information on cyber crime and crimes in India and its	К3				
	ITAct					
CO2:	Understanding security and privacy for mobile and wireless devices	K3				
CO3:	Know the sources of cyber threats and impact of threat intelligence along with	К3				
	threat detection methods.	113				
	Learn and Understand the Indian laws related to cyber security. Understand					
CO4:	the concept to managing Forensic Data and Study the Forensic analysis of	K4				
	storage media and web.					
	Know the Security and Privacy implications from cloud computing-Social					
CO5:	Media Marketing –Protecting People's Privacy in Organization .Study the K4					
	money laundering controls by analyzing mini-cases.					

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	2	2	3	3
CO 2	2	2	3	2	2	3
CO 3	2	1	3	3	2	3
CO 4	2	3	2	2	2	3
CO5	1	3	2	2	3	3

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

Unit	Cyber Security	Hrs	Pedagogy
I	Introduction to Cybercrime - Introduction · Cybercrime: Definition and Origins of the Word- Cybercrime and Information Security- Who are Cybercriminals? - Classifications of Cybercrimes- Cybercrime: The Legal Perspectives-Cybercrimes: An Indian Perspective-Cybercrime and the Indian ITA 2000-A Global Perspective on Cybercrimes-Cybercrime Era: Survival Mantra for the Netizens.	15	Chalk & Talk, ICT Kit
Π	Introduction – Proliferation of Mobile and Wireless Devices –Trends in Mobility-Credit Card Frauds in Mobile and Wireless Computing Era- Security Challenges posed by Mobile Devices-Authentication Service Security-attacks on Mobile /Cell phones –Mobile Devices: Security Implications for Organizations.	15	Chalk & Talk, ICT Kit
III	Introduction –Proxy servers and Anonymizers – Phishing –Password Cracking- Virus and Worms –Trojan Horses and Backdoors–Dos and DDos Attacks-SQL Injection –Attacks on Wireless Networks.	15	Chalk & Talk, ICT Kit
IV	Introduction-Why do we need cyber laws-The Indian IT Act-Challenges to Indian Law and Cybercrime Scenario in India- Digital Signatures and the Indian IT Act-Cyber crime and Punishment –Cyber law, Technology and students: Indian Scenario. Understanding Computer Forensics: Introduction – Digital Forensics Science-Cyberforensics and Digital Evidence-Challenges in Computer Forensics- Special Tools and Techniques	15	Chalk & Talk, ICT Kit
V	Introduction-Cost of Cybercrimes and IPR issues –Security and Privacy implications from cloud computing-Social Media Marketing –Protecting People's Privacy in Organization – Incident Handling –Media and Asset Protection-importance of endpoint security in Organizations. Cybercrime: Illustrations, Examples and Mini-cases: Introduction-Real life Examples- Mini-cases-Illustrations of Financial Frauds in Cyber Domain-Digital Signature Related Crime Scenarios	15	Chalk & Talk, ICT Kit

Course Designed by: N.Hemavathi & Mr.M.Selvakumar

	Learning Outcome Based Education & Assessment (LOBE)								
		Articulation	Formative E Mapping – K	lxaminatio K Levels wi	n - Blue Prin th Course Ou	t itcomes	(COs)		
			Sectio	Section A		B	Section C	Section D	
Inte	Cos	K L evel	MC	Qs	Short Ans	swers	Fither or	Onen	
rnal	0.05	K Level	No. of.	K -	No. of.	К -	Choice	Choice	
			Questions	Level	Questions	Level	Choice	Choice	
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AII	CO4	Up to 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	
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 Section A K (Multiple Level Choice Questions)		Section B (Short Answer Questions)	on BSection Cort(Either / OrwerOr 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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	_	_	10	10	20	40	40				
	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

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	MCQsShort AnswersNo. ofK -QuestionsLevelQuestionLevel		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 as	ked with	the given K	level)			

		Dis	stribution of	Marks with	n K Leve	l	
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	
	Questions)	Questions)				choice)	
K1	5		-	-	5	4.17	17
K2	5	10	-	-	15	12.5	17
K3	-	-	30	30	60	50	50
K4	_	_	20	20	40	33.33	33
Marks	10	10	50	50	120	100	100
NUD TT		0		• / •			

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

Section A (Multiple Choice Questions)							
Answer All	l Questi	ions	(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 (Short A	Answers)					
Answer All	l Questi	ions	(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 (Either/	Or Type)					
Answer All	l Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of				
K levels							
Section D (Open (Choice)					
Answer An	y Thre	e question	s (3x10=30 <u>marks</u>)				
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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	INTERNET OF THINGS								
Course Code	21UCSE55			L	Р	С			
Category	Core Elective			5	-	5			
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPREN	URSH	IP	✓			
Course Objecti	ves:								
 To understand the communication technologies in for . To know the IoT protocols and web of things. To know the various applications of IoT. To understand building blocks of Internet of Things and characteristics. To define the infrastructure for supporting IoT deployments. Unit: I Introduction 15 Introduction to Internet of things: Introduction to Internet of things– Definition & Characteristics of IoT - Physical Design of IoT – Things in IoT - IoT protocols. Logical Design of IoT :IoT Functional blocks- IoT communication Models- IoT communication APIs. IoT Enabling Technologies – Wireless Sensor Networks- Cloud Computing- Big data Analysis – Communication Protocols – Embedded systems. IoT Level-1 IoT Level-2 IoT Level -3 IoT Level-4 IoT Level-5 IoT Level 6									
Level -6	Level -6								
Unit: II Dor	nain Specific IoTs:		· 1.4: 0 · 4	1'	15	5			
Intrusion Detect Structural Health Monitoring- Air Floods Detection	ion-Smoke/ Gas Detector Monitoring – Surveilla Pollution Monitoring - - Energy- Retail- Logis	ors. Cities– Smart Parking- ance – Emergency Respons Noise Pollution Monitoring stics-Agriculture	Smart Lighting- S se. Environment – g - Forest Fire Det	Smart Weath ection	roads her – Ri	– ver			
Unit: III IoT	and M2M	6			15	5			
Unit: III101 and M2M15IoT and M2M : Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT – Software Defined Networking – Network Function Virtualization – IoT System Management with NETCONF – YANG – Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Limitations of SNMP – Network Operator Requirements – NETCONF – YANG – IoT Systems Management with NETCONF – YANG – IoT Design Methodology15Introduction - IoT Design Methodology – Introduction – IoT Design Methodology – Purpose15									
&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 DevelopmentUnit: VData Analytics for IoT15									
Apache Hadoop Data analytics	-Apache OozeApache S	SparkApache Storm- Using	g Apache Storm fo	r Real	Time	e			
Books for Stud	y:		Total Lecture Ho	ours	75 H	[rs			

1.ArshdeepBahga, Vijay Madisetti, Internet of Things - A Hands on Approach University Press (India)Private Limited,New Delhi,2014

Books for References:

1. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.

2. Francis da Costa, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, A Press Publications, 2013.

Web Resources:

1. <u>https://www.edureka.co/blog/iot-tutorial/</u>

2. https://www.gangboard.com/blog/iot-tutorial/

3.	3. https://www.cs.ucy.ac.cy/courses/EPL422/slides19/Topic10b-IoT_intro.pdf									
Co	urse	e Outcomes	K Level							
c	1.	Describe and explain about IoT, Physical and Logical design of IoT, IoT	K3							
COI	Л:	levels, domainspecific IoTs								
CC)2:	Determine physical and logic design of IoT.	K3							
CC)3:	Compare Physical and Logical IoT, different levels and domain specific IoTs.	K3							
C	M .	Conclude the importance of IoT, Physical and Logical IoT, IoT levels, domain	KA.							
CO4:	J4:	specific IoTs.								
CC)5:	Design and develop Physical and Logical IoT, IoT deployment templates.	K4							

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	2	2	3
CO 2	1	3	2	2	3	3
CO 3	2	2	3	2	2	3
CO 4	3	1	3	1	3	3
CO5	3	3	2	2	1	3

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

LESSON PLAN

Unit	Internet of Things	Hrs	Pedagogy
I	Introduction to Internet of things: Introduction to Internet of things- Definition & Characteristics of IoT - Physical Design of IoT - Things in IoT - IoT protocols. Logical Design of IoT :IoT Functional blocks- IoT communication Models- IoT communication APIs. IoT Enabling Technologies - Wireless Sensor Networks- Cloud Computing- Big data Analysis - Communication Protocols - Embedded systems. IoT Level-1 IoT Level-2 IoT Level -3 IoT Level-4 IoT Level-5 IoT Level -6	15	Chalk&Talk, ICTKit
п	IoT and M2M : Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT – Software Defined Networking – Network Function Virtualization – IoT System Management with NETCONF – YANG – Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Limitations of SNMP – Network Operator Requirements – NETCONF – YANG – IoT Systems Management with NETCONF – YANG.	15	Chalk&Talk, ICTKit
ш	IoT and M2M : Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT – Software Defined Networking – Network Function Virtualization – IoT System Management with NETCONF – YANG – Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Limitations of SNMP – Network Operator Requirements – NETCONF – YANG – IoT Systems Management with NETCONF – YANG.	15	Chalk&Talk, ICTKit
IV	Introduction - IoT Design Methodology – Introduction – IoT Design Methodology – Purpose & 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	15	Chalk&Talk,ICT Kit
V	Apache Hadoop-Apache OozeApache SparkApache Storm- Using Apache Storm for Real Time Data analytics	15	Chalk&Talk, ICTKit

Course Designed by: Dr.G.Devika & Mrs.S.Amutha

	Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print										
	Articulation Mapping – K Levels with Course Outcomes (COs)										
			Sectio	Section A		Section B		Section D			
Inte rnal	Cos	K Level	MC	Qs	Short Ans	swers	Either or	Open			
	005		No. of.	К-	No. of.	К-	Choice	Choice			
			Questions	Level	Questions	Level					
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO4	Up to 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	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 Section A K (Multiple Level Choice Questions)		Section B (Short Answer Questions)	Section BSection C(Short(Either / OrAnswerOr 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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	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

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	MCQ No. of	2s K –	Short An	swers K –	Section C (Either /	Section D (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	ions to be	10		5		10	5			
	Aske	ed	10		3		10	3			
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	4.17	17					
K2	5	10	-	-	15	12.5	17					
K3	-	-	30	30	60	50	50					
K4	-	-	20	20	40	33.33	33					
Marks	10	10	50	50	120	100	100					
NTD TT		0	.									

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

Section A (Multip	le Choice (Questions)
Answer All	Questi	ions	(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 (Short A	(Inswers)	
Answer Al	l Questi	ions	(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 (Either/	Or Type)	
Answer Al	l Questi	ions	(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: Highe	r level (of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer A	ny Thre	ee question	as (3x10=30 marks)
Q.No	CO	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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name DATA MINING TECHNIQUES									
Course Code	21UCSE56					L	Р	С	
Category	Core Elective					5	-	5	
Nature of courses	EMPLOYABILITY	✓ SI	KILL ORIENTED	✓	ENTREPRENEU	RSH	IP	✓	
Course Objectives:									
• Know the Data Mining principles, techniques and discover the knowledge imbibed in the									
high dimensional system.									
• Prepare	evaluation criteria for clus	sterii	ng methods.						
 Study al 	gorithms for finding the h	nidde	n interesting pattern	s in	data in real life.				
• Expose t	he students to the concept	ts of	Data warehousing A	Arcł	nitecture, implem	entat	ion a	nd	
analyze t	he various models.		_		_				
• Study the	overview of Web Mining, T	Text 1	Mining and develop a	ppli	cation tools				
Unit: I Intro	duction To Data Mining					15 H	lours		
Introduction To	Data Mining: Introducti	ion-W	Vhat is Data Mining	?-D	efinition-KDD vs	Data	Min	ing-	
DBMS vs DM-I	M Techniques-Other Min	ning I	Problems-Issues and	cha	llenges in DM-D	M Ap	oplica	tion	
Areas-DM Applic	ations-Case Studies.					1			
Unit: II Data	Warehousing					15 H	lours		
Data Wareho	using: Introduction- D	Data	Warehouse Archi	tect	ure-Dimensiona	l Mo	odelli	ng-	
Aggregate Fu	nction- OLAP Oper	ratio	ns-ROLAP-MOLAI	P-C	ube Computat	ion-N	Iultiv	way	
simultaneous Ag	gregation-Cloud Data W	/areh	ousing						
Unit: III Asso	ciation Rules					15 H	lours		
Association Rul	es: Introduction- Associa	ation	n Rule Methods to d	lisc	over Association	Rule	s-Apr	iori	
Algorithm-Parti	ion Algorithm-Pincer-S	Searc	h Algorithm- FP-	tre	e Growth Alg	gorith	m-Ra	pid	
Association Rule	Mining - Border Algorith	າm-A	ssociation Rules wit	h It	em Constraints				
Unit: IV Clus	tering Techniques					15 H	lours		
Clustering Teo	hniques: Clustering Pa	radig	gms-Partitioning Al	gor	ithms-K-Medoid	l Alg	orith	ms-	
CLARA-CLAR	ANS Decision Trees:	Wha	t is Decision Tree	? -	-Tree constructi	on P	rincij	ple-	
Decision Tree C	onstruction Algorithms-	CAR	RT-ID3Decision Tree	e C	onstruction with	Preso	rting	•	
Unit: V Web	Mining					15 H	lours		
Web Mining: I	ntroduction- Web Mining	g-We	b Content Mining-	Wel	b Structure Minin	ng-W	eb us	age	
Mining-Text Mi	ning- Text Clustering		-			-		-	
			To	tal	Lecture Hours	75 H	Irs		
Books for Stud	y:					•			
2. I	Data Mining Techniques, A	Arun	K Pujari,4 th Edition	,20	17				
Books for Refe	rences:								
4. Data	Mining Concepts & Tech	hnolo	ogies, Jiawei Han, M	lich	elinekamber, Mo	organ			
KaufmannSecond Edition, 2005.									
5. Data	5. Data Mining, VikramPudi, P.Radha Krishna, Oxford University Press. First Edition.								
2009	•				-				
6. Data	Warehousing – ReemaTh	harej	a Oxford University	Pro	ess – 2009.				
7. Insig	ht into Data Mining Theo	ory a	nd Practice – K.p. S	om	an, ShyamDiwak	ar, V	.Ajay	ν,	
Academic C	ouncil Meeting Held On	20.0	04.2023	-		Pag	e 12		

	Prentice Hall of India – 2008	
Web R	Resources:	
	1. <u>https://www.w3schools.com/</u>	
	2. <u>https://www.javatpoint.com/data-warehouse</u>	
	3. <u>https://nptel.ac.in/courses/106/105/106105174/</u>	
Course	e Outcomes	K Level
CO1	Understand the functionality of the various data mining and data warehousing	K3
COI	component.	KJ
COY	Appreciate the strengths and limitations of various data mining and data	K3
02	warehousing models	K3
CO3	Explain the analyzing techniques of various data	K3
CO4	Describe different methodologies used in data mining and data ware housing	K4
CO5	Compare different approaches of the data warehousing and data mining with	V A
003	various technologies.	N 4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	1	3	3	3	3
CO 2	2	2	3	2	2	3
CO 3	2	3	3	2	1	3
CO 4	3	2	3	1	2	3
CO5	2	3	3	2	2	3

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

Unit	Data Mining Techniques	Hrs	Pedagogy
I	Introduction To Data Mining: Introduction-What is Data Mining?- Definition-KDD vs Data Mining-DBMS vs DM-DM Techniques-Other Mining Problems-Issues and challenges in DM-DM Application Areas-DM Applications-Case Studies.	15	Chalk & Talk, ICT Kit
п	Data Warehousing:Introduction-DataWarehouseArchitecture-DimensionalModelling-AggregateFunction-OLAPOperations-ROLAP-MOLAP-CubeComputation-MultiwaysimultaneousAggregation-CloudDataWarehousing	15	Chalk & Talk, ICT Kit
III	Association Rules: Introduction- Association Rule Methods to discover Association Rules-Apriori Algorithm-Partition Algorithm- Pincer-Search Algorithm- FP-tree Growth Algorithm-Rapid Association Rule Mining - Border Algorithm-Association Rules with Item Constraints.	15	Chalk & Talk, ICT Kit
IV	ClusteringTechniques:ClusteringParadigms-PartitioningAlgorithms-K-MedoidAlgorithms-CLARA-CLARANSDecisionTrees:What is DecisionTree?-Tree constructionTreeConstructionAlgorithms-CART-ID3DecisionTreeConstruction with Presorting	15	Chalk & Talk, ICT Kit
v	Web Mining: Introduction- Web Mining-Web Content Mining- Web Structure Mining-Web usage Mining-Text Mining- Unstructured Text - Text Clustering	15	Chalk & Talk, ICT Kit

LESSON PLAN

Course Designed by: Mrs.K.Sandya &Mrs.C.D.Balapriya

	Learning Outcome Based Education & Assessment (LOBE)								
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)								
			Sectio	on A	Section	B	Section C	Section D	
Inte	Cos	K L evel	MC	Qs	Short Ans	swers	Fither or	Onen	
rnal	CUS	K Level	No. of.	K -	No. of.	К -	Choice	Choice	
			Questions	Level	Questions	Level	Choice	CHUICE	
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AII	CO4	Up to 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	estion 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			
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			
CIA	K3	-	-	10	10	20	40	40		
II	K4	-	-	10	10	20	40	40		
	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

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	MCC No. of Questions	MCQs Short Answer No. of K – No. of I Questions Level Question L		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 answered1055							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	4.17	17				
K2	5	10	-	-	15	12.5	17				
K3	-	-	30	30	60	50	50				
K4	-	-	20	20	40	33.33	33				
Marks	10	10	50	50	120	100	100				
NTD TT		•	.								

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

Section A (Multip	le Choice (Questions)
Answer All	l Questi	ions	(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 (Short A	(Inswers)	
Answer All	l Questi	ions	(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 (Either/	Or Type)	
Answer All	l Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer An	y Thre	e questions	s (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 SCIENCE (For those who joined in 2021-2022 and after)

Course Na	Course Name R PROGRAMMING LAB								
Course Co	de 21U	CSSP5					L	Р	C
Category	Skil	l					-	2	2
Nature of	course:	EMPLOYABILITY	\checkmark	SKILL ORIENTED	✓	ENTREPRENE	URS	HIP	✓
Course ob	jectives:				1	I			.1
• To in	mport a vari	ety of data formats int	o R	using R Studio.					
• To in	ntroduce the	concepts of program	ning	g with examples.					
• To le	earn the fund	damental programming	g co	oncepts and methodol	logi	es which are es	senti	al to	
build	ling good R	programs.			U				
• To u	nderstand th	ne fundamental syntax	of I	R through readings, p	orac	tice exercises, d	emo	nstrati	ions,
and	writing R co	ode.							
• To a	pply critical	programming languag	ge c	oncept such as data t	ype	s, iteration, Cor	trol	structu	ure,
functions, and Boolean operators by writing R programs and through examples.									
S. No.		L	ist o	of Programs				Ho	urs
1.	Learn all t	he basics of R-Program	nmi	ing (Data types, Varia	able	es, Operators etc	:.).		
2.	Making op	perations on if-else star	tem	ents in R.					
3.	Creating p	rograms on For loop i	n R.						
4.	Creating p	rograms on While loo	p in	R.					
5.	Write an R	a program to calculate	a Fi	ibonacci series.					
6.	Write an R	a program to create a b	oar p	plot.				3	0
7.	Implement	t different data structu	res i	in R (Vectors, Lists,	Dat	a Frames)		C	•
8.	Creating n	natrix and manipulatio	n m	atrix in R.		_			
9.	Create a da	ata set and do statistica	al ar	alysis on the data us	ing	R.			
10.	Perform th	e various operations o	n li	sts in R .					
11.	Presentatio	on using Text, animati	on,	images, media .					
12.	Creating a	graph in a PowerPoin	t sli	des.					
						Total Ho	ours		30
Books for S	tudy:								
1. Cotton, R	., Learning	R: a step by step funct	ion	guide to data analysi	s. 1	st edition. O'rei	lly		
Media Inc.									

Books for References:

1. Gardener, M. Beginning R: The statistical programming language, 2017, WILEY.

2. Lawrence, M., & Verzani, J. Programming Graphical User Interfaces in R, 2016, CRC Press.

Web Resources:

- 1. <u>https://www.tutorialspoint.com/r/r_tutorial.pdf</u>
- 2. FULL R PROGRAMMING METERIAL 2.pdf (stmarysguntur.com)
- 3. https://www.jnec.org/labmanuals/it/te/sem1/R-lab.pdf
- 4. https://www.r-project.org
- 5. <u>https://www.slideshare.net/GRajendra/r-programming-lab-manual</u>

Course	Course Outcomes					
CO1	Construct the programming logic using R Packages.	K3				
CO2	Differentiate the Data types for developing programs.	K3				
CO3	Show the installation of R Programming Environment.	К3				
CO4	Analyze the datasets using R programming capabilities.	K3				
CO5	Classify the use of different R Data Structures	K4				

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	2	2	2	2	3
CO 2	2	2	2	3	2	3
CO 3	1	3	2	2	3	3
CO 4	3	3	2	1	2	3
CO5	1	3	3	3	1	3

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

LESSONPLAN

S. No.	R Programming Lab	Hours	Mode
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	Learn all the basics of R-Programming (Data types, Variables, Operators etc.) . Making operations on if-else statements in R. Creating programs on For loop in R. Creating programs on While loop in R. Write an R program to calculate a Fibonacci series. Write an R program to create a bar plot. Implement different data structures in R (Vectors, Lists, Data Frames) Creating matrix and manipulation matrix in R. Create a data set and do statistical analysis on the data using R. Perform the various operations on lists in R. Presentation using Text, animation, images, media. Creating a graph in a PowerPoint slides.	30	Black Board, Lab Demonstr ation and LCD Projector.
	Total Hours	30	

Course Designed by: Mrs.P.Rajeswari & MRs.K.Sandya





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

Course Name	C# AND .NET PROG	RA	MMING					
Course Code	21UCSC61					L	Р	С
Category	egory Core							4
Nature of cours	e: EMPLOYABILITY	✓	SKILL ORIENTED	✓	ENTREPRENU	J RSH	IP	✓
Course Objecti	ves:							
• To get c	omplete knowledge of M	IS.N	ET Framework and its	s int	ternals.			
To devel	op deep understanding of	of C#	# language features.					
To build	strong concepts of OOP	's ar	nd implement the same	in	C#.			
• To creat	e and manage strings, ar	rays.	, structures, and enume	erat	ors using .NET	frame	eworl	K
library.					C			
To build	GUI applications using	.NE	T Framework and Wir	Fo	rms API.			
Unit: I INT	TRODUCTION TO C#						20	
Introducing C [#]	+ - Understanding .NE	T: T	The C# Environment	t —	Overview of	C# -	Liter	als,
Variables and	DataTypes – Operator	s an	d Expressions – Dec	isio	on Making and	1 Bra	nchii	1g -
Decision Maki	ng and Looping.							-0
Unit: II AR	RAYS AND STRINGS						15	5
Methods in C#	- Handling Arrays – M	Aan	ipulating Strings – S	truc	ctures and Enu	mera	tions	•
Unit: III INT	TRODUCTION TO OC	PS					20)
Classes and Ob	ojects – Inheritances ar	nd P	olymorphism-Interfa	ce:	Multiple Inhe	ritan	ce	
Unit: IV DE	LEGATES AND EXC	EPT	ION HANDLING		1		15	5
Delegates and	Events -Managing erro	ors a	and exception					
Unit: V AP	PLICATION DEVELO)PM	IENT				20)
Windows Forms	and Web-Based Applic	atio	n Development on NF	T				
vv mao ws i orm	s and web Dased Applie	allo			tal Lecture Ho	urs	90 H	rs.
Books for Stud	v•			10		uis	<i>7</i> 0 II	15.
1. Balaguri	isamy E. Programming	in C	# Tata McGraw Hill	Ne	w Delhi, Fourth	n Edit	ion	
2004.	, , , , , , , , , , , , , , , , , , ,		, 1	1.0			,	
Unit I	- Chapters1to7							
Unit II	- Chapters8to11							
Unit III	- Chapters12to14							
Unit IV	- Chapters16,18							
Unit V	- Chapter 20							
Books for Refe	rences:							
1. Rober P	owell, Richard Weeks, O	C# a	nd .NET Framework, '	Тес	h Media Public	ation,	New	7
Delhi,20	08.							
2. Jesse Lit	perty, Programming C#,	O'R	EILLY, Fourth Editio	n, 2	2005.			
3. Mathew	Macdonald, The Compl	ete I	Reference ASP.NET, 7	Tata	McGraw Hill H	Publis	hing	Pvt
Ltd., 200)8							
Web Resources								
1. <u>https://www</u>	v.guru99.com>net-fram	ewo	<u>ork</u>					

- 2. <u>https://docs.microsoft.com>en-us>dotnet</u>
- 3. <u>https://www.c-sharpcorner.com</u>
- 4. <u>https://spoken-tutorial.org/tutorial-</u> search/?search_foss=Python+3.4.3&search_language=English

Course	e Outcomes	K Level
CO1:	Understand code solutions and compile C# projects within the .NET framework	K3
CO2:	Design and develop professional console and window-based .NET application	K3
CO3:	Demonstrate knowledge of object-oriented concepts Design user experience and functional requirements C#.NET application.	K3
CO4:	Construct classes, methods, and assessors, and instantiate objects.	K4
CO5:	Understand and implement string manipulation, events, and exception handling within .NET application environment.	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	1	2	2	3	3
CO 2	2	2	3	1	3	3
CO 3	3	2	1	3	2	3
CO 4	1	3	2	2	3	3
CO5	2	2	2	2	3	3

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

LESSON PLAN

Unit	C# And .Net Programming	Hrs	Pedagogy
I	Introducing C# - Understanding .NET: The C# Environment –Overview of C# - Literals, Variables and Data Types – Operators and Expressions – Decision Making and Branching - Decision Making and Looping.	20	Chalk & Talk, ICT Kit
II	Methods in C# - Handling Arrays – Manipulating Strings-Structures and Enumerations.	15	Chalk & Talk, ICT Kit
III	Classes and Objects – Inheritances and Polymorphism-Interface: Multiple Inheritance	20	Chalk & Talk, ICT Kit
IV	Delegates and Events -Managing errors and exception	15	Chalk & Talk, ICT Kit
V	Windows Forms and Web-Based Application Development on .NET	20	Chalk & Talk, ICT Kit

Course Designed by: Mrs.S.Amutha & Dr.G.Devika

	Learning Outcome Based Education & Assessment (LOBE)										
	Articulation Mapping – K Levels with Course Outcomes (COs)										
			Sectio	on A	Section	B	Section C	Section D			
Inte	Cos	K Level	MC	Qs	Short Ans	swers	Either or	Onen			
rnal	003	IX LEVEI	No. of.	К -	No. of.	К -	Choice	Choice			
			Questions	Level	Questions	Level					
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO4	Up to 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	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					
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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	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

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										
S No	COs	K - Level	MCQs		Short Answers		MCQs Short Answers Section C MCQs V (Either /)		Section C (Either /	Section D
5.110			Questions	K – Level	Question	K – Level	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	ions to be	10		5		10	5		
	Aske	ed	10		3		10	3		
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	4.17	17			
K2	5	10	-	-	15	12.5	17			
K3	-	-	30	30	60	50	50			
K4	-	-	20	20	40	33.33	33			
Marks	10	10	50	50	120	100	100			
NTD TT		•	.							

NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.
Section A (Multip	le Choice (Questions)
Answer All	l Questi	ions	(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 (Short A	(Inswers)	
Answer All	Questi	ions	(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 (Either/	Or Type)	
Answer All	Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer An	y Thre	e question	s (3x10=30 marks)
Q.No		K Level	Questions
21		K3	
22	CO2	K3	
23	<u>CO3</u>	K3	
24	CO4	K4	
25	CO5	K4	

Summative Examinations - Question Paper – Format



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

Cours	se Name	C# A	AND .NET P	ROGRA	MM	IING LAB						
Cours	se Code	210	CSCP6							L	Р	C
Categ	gory	Cor	e							-	6	4
Natur	re of cour	se:	EMPLOYA	BILITY	✓	SKILL ORIENT	ED ,	~	ENTREPRENU	RSH	IP	✓
Cours	se objecti	ves:										
	 To 1 To 1 Stud To 1 To 2 To 3 To 4 Ibra 	gain t know dents build create ary.	he ability to i about windo will be able t strong conce and manage	mplemer ws, Web o Facilita ots of OC strings, a	and (and (ates e)P's a arrays	algorithms in C#. Console Application experiential learning and implement the s, structures, and e	net, V ons. g. same numer	B. in rat	net and ASP.net. C#. ors using .NET f	rame	work	
<u>S. No.</u>	Desis	<u>ан</u>]	List o	of Programs					Ho	urs
1. 2.	Classe	∠# pros	objects									
3.	Inherit	ance										
4.	Operat	or ov	erloading									
5.	Thread	ling									9	0
6.	Events	and	lelegates									
7.	Worki	ng wi	th windows f	orms con	trols							
8.	Valida	ting d	ata									
9.	Creatin	ng cus	stom dialog b	ox and d	esign	ing an MDI applic	ation	wi	th menu			
10.	Retriev	ving I	Data from Da	tabase &	Wor	king with Disconr	ected	Er	nvironment			
Daalaa	for Ctrade								Total H	ours	9	0
BOOKS	1. B	alagu: 004.	rusamy. E, Pi	ogramm	ing ir	n C #, Tata McGra	w Hill	l, 1	New Delhi, Fourt	h Ed	ition,	
Books	for Refer	ences	:									
1. 2. 3.	Rober P NewDelh Jesse Lib Mathew I 2008.	owell i,200 erty, l Macde	, Richard We 8. Programming onald, The Co	eks, C# a C#, O'R omplete l	and .] EIL] Refer	NET Framework, ' LY, Fourth Edition rence ASP.NET, T	Fech N , 2003 ata Mo	Me 5. cG	dia Publication, raw Hill Publish	ing F	Pvt Lte	d.,
	Academic	: Cou	ncil Meeting	Held O	n 20.	04.2023			I	Page	134	

Web Resources:

- 1. <u>https://www.guru99.com>net-framework</u>
- 2. https://docs.microsoft.com>en-us>dotnet
- 3. https://www.c-sharpcorner.com
- 4. <u>https://spoken-tutorial.org/tutorial-</u> search/?search_foss=Python+3.4.3&search_language=English

Cours	e Outcomes	K Level
CO1:	Display proficiency in C# by building stand-alone applications in the .NET framework using C#	К3
CO2:	Create distributed data-driven applications using the .NET Framework, C#, SQL Server and ADO.NET	К3
CO3:	Apply the syntax of basic C# programming constructs.	K3
CO4:	Create web-based distributed applications using C#, ASP.NET, SQL Server and ADO.NET	К3
CO5:	Understand the concept of Web Applications.	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	1	3
CO 2	2	2	2	3	2	3
CO 3	1	3	3	2	2	3
CO 4	2	2	1	3	3	3
CO5	3	2	2	1	3	3

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

LESSONPLAN

S. No.	C# And .Net Programming Lab	Hours	Mode
1.	Basic C# programs		
2.	Classes and objects		
3.	Inheritance		
4.	Operator overloading		
5.	Threading		Black Board, Lab
6.	Events and delegates	90	Demonstrati
7.	Working with windows forms controls		Projector.
8.	Validating data		
9.	Creating custom dialog box and designing an MDI application with menu		
10.	Retrieving Data from Database & Working with Disconnected Environment		
	Total Hours	90	

Course Designed by: Mrs.S.Amutha &Dr.G.Devika



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

Course Name	PROJECT AND VIV	VA V	OCE							
Course Code	21UCSPR1						L	Р	С	
Category	Core						-	6	4	
Nature of course:	EMPLOYABILITY	✓	SKILL ORIENT	ED	✓	ENTREPR	ENU	RSHI	P	~
COURSE OBJECT	IVES:									
• To develop an abil	ity to design and impler	nent	a software.							
• To select individ	lually Commercial or	Tec	hnical Project ba	ased	on	Application	n De	evelo	pmer	ıt
Technologies.										
• To know the techn	ologies they can develo	p the	software.							
• To Facilitates expe	eriential learning.									
• To do Real time pr	rojects.									
	> Title									
	Synopsis									
	Introduction									
	Module description	1								
	Existing and propos	ed sy	stem							
	Data Flow Diagram Sustam Elous Diagram						00	IIa		
	 System Flow Diagra Entity Pelationship 	1111 Diag	ram				90	по	urs	
	 Entity Relationship : Form Design 	Diag	i alli							
	 Database Design 									
	 Testing 									
	Implementation									
	 Form Design 									
I	0		7	Fotal	Lee	cture Hours	s 90	Ног	irs	
Books for Study:										
1. Rober Powell, Ri	chard Weeks, C# and .N	JET I	Framework, Tech	Media	a Pu	blication, N	lew D	Delhi,		
2008.										
Books for Referenc	e:									
1. Mike Holcombe	e, "Running an Agile So	ftwaı	e Development Pr	oject	" W	'iley, 2008				
2. Laura M. Leven	thal, Julie A. Barnes "U	sabil	ity Engineering: P	roces	ss, P	roducts, and	1			
Examples,", Pe	arson/Prentice Hall, 200)8								
3. Adrienne Watt,	"Project Management",	BCo	campus, 2014							
4. Jones, <u>Evidence</u>	-based Software Engine	ering	, Knowledge Soft	ware,	202	20				
Web Reference:										
I. <u>https://www.up</u>	grad.com/blog/web-de	velor	<u>ment-project-ide</u>	eas-fo	or-b	eginners/				
2. <u>https://www.geo</u>	eksforgeeks.org/web-do	evelo	pment-project-id	leas/			,			
3. <u>https://raddevo</u>	<u>n.com/articles/10-great</u>	t-wel	<u>o-aevelopment-les</u>	arnin	ig-p	oroject-idea	<u>s/</u>			
4. <u>nttps://www.ed</u>	<u>x.org/course/project-m</u>	anag	cement-ior-develo	opme	nt					
5. <u>IIIIps://spoken-l</u>	<u>utorial.org/tutorial-</u> foss=Dython 12.4.2.8-or	arah	languaga-Engli	ch						
scarcii/ i starcii	<u>1035-1 y 11011+3.4.3 & St</u>		languagt-Dhgh	.511						

Course O	Course Outcomes:				
At the end of the Course the students will be able to					
CO1	Design and implement a software with a good aesthetic sense of designing and latest technical know-how's.	К3			
CO2	Project one that involves practical work for understanding and solving problems in the field of computing.	К3			
CO3	Familiar with any software and develop tools	K4			
CO4	Develop a software or application using languages.	K4			
CO5	Document the application with implementation.	K4			

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	2	2	3
CO 2	2	2	2	2	3	3
CO 3	2	1	2	2	3	3
CO 4	2	3	2	3	1	3
CO5	3	2	2	2	2	3

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

LESSON PLAN

Module	Project And Viva Voce	Hrs	Mode
Ι	TitleSynopsisIntroduction	18	Practical
II	Module descriptionExisting and proposed system	18	Practical
III	 Data Flow Diagram System Flow Diagram Entity Relationship Diagram 	18	Practical
IV	Form DesignDatabase Design	18	Practical
V	TestingImplementation	18	Practical Presentation

Course Designed by:Dr.G.Devika& Mrs.S.Amutha



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

Course Name	rse Name CLOUD INFRASTRUCTURE AND SERVICES							
Course Code	21UCSE61					L	Р	C
Category	Core Elective					5	-	5
Nature of course	EMPLOYABILITY	~	SKILL ORIENTED	~	ENTREPRENEU	JRSH	IP	✓
Course Objecti	ves:							
• To	learn how to use Cloud	l Serv	vices.					
• To	implement Virtualizati	on co	oncepts.					
• Br	badly educate to know	the	impact of engineerin	g c	n legal and soci	etal i	ssues	3
i	ivolved.							
• To	learn Aneka programm	ning.	in the Classel					
• Př Unit. I. Untr	pose the various applic	cation	is in the Cloud.			15 I	Iours	
Introduction:	Cloud computing at a	دات د	nce Historical Dev	مام	nments Building		ud)
Computing Env	ronments Computing la	i gia Platfo	orms and Technologie	2010 24	pinents, Dunuing	; CIU	uu	
Principles of Pa	rallel and Distributed	Con	nputing: Eras of Con	nnu	ting. Parallel Vs	Distr	ibute	d
computing, Eler	nents of ParallelCompu	ting,	Elements of Distribut	ted	Computing, Tecl	hnolo	gies	for
Distributed Con	puting.	U,			1 0,		C	
Unit: II Virt	ualization, & Cloud C	omp	uting Architecture			15 H	Iours	5
Virtualization:	Introduction, Character	ristics	s of Virtualized Envir	oni	nents, Taxonomy	/ of		
Virtualization T	echniques, Virtualizatio	nand	l Cloud Computing, P	ros	and Cons of			
Virtualization, 7	echnology Examples.							
Cloud Compu	ting Architecture: I	ntrod	luction, Cloud refer	enc	e model, Type	es of	clo	uds,
Economics of th	e cloud, open challenge	s.						
Unit: III Ane	ka & Concurrent Con	iputi	ng			15 H	lours	5
Aneka: Cloud	Application Platform:	Fran	nework Overview, An		omy of the Aneka			
Concurrent Concurrent	mig Alleka Clouds, Clo	uapro	mming • Introducing	ige	ment. arallelism for Si	nala	macl	ning
Computation P	rogramming Application	n wi	th Threads Multithre	s I sadi	ing with Aneka	Prog	ramn	ning
Applications wi	h Aneka Threads	VII VVI	in meaus, multime	au	ing with Alleka,	1105	ann	mg
Unit: IV High	- Throughput Compu	ting	& Data Intensive (Con	nputing	15 H	Iours	5
High- Through	put Computing: Task	Prog	gramming: Task Con	npu	ting, Task-based	1		
Application Mo	lels, Aneka Task-Based	lProg	gramming.					
Data Intensive	Computing: Map-Re	educe	e Programming: Wh	nati	s Data-Intensive	Comp	outing	<u>z</u> ,
Technologies for Data-Intensive Computing, Aneka MapReduce Programming.								
Unit: V Clou	d Platforms & Cloud	Арр	olications			15 H	Iours	5
Cloud Platforn	s in Industry: Amazon	n Wel	b Services, GoogleAp	рĒ	ngine, Microsoft			
Azure, Observat	Azure, Observations.							
Cloud Applications: Scientific Applications, Business and Consumer Applications.								
Advanced To	Advanced Topics in Cloud Computing: Energy Efficiency in Clouds, Market Based							
Management of	Clouds, Federated Clo	uds/li	nterCloud, Third Part	y C	loud Services.		Τ	
			10	tal	Lecture Hours	75	ars	

Books	Books for Study:					
1.	Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi, " Mastering Cloud	Computing				
	Foundations and Applications Programming ", Mc Graw Hill Education, 2013.					
Un	it I - Chapter 1(Full), Chapter 2(full)					
Un	it II - Chapter 3(full), Chapter 4(full).					
Un	it III - Chapter 5(Full), Chapter 6(Full)					
Un	it IV - Chapter 7(Full), Chapter 8(Full).					
Un	iv V – Chapter 9(Full), Chapter 10(Full)					
Books	for References:					
1.Mich	ael Miller, "Cloud Computing", Pearson Education, New					
2.Hale	y Beard, Cloud Computing Best Practices for Managing and MeasuringProcess	es for				
On- de	mand Computing, Applications and Data Centers in theCloud with SLAs, Emere	o Pty				
Limited	d, July 2008.					
3.Clou	d Application Architectures, George Reese, ISBN: 8184047142, Shroff/O' Reilly,	2009.				
Web R	lesources:					
1. htt	tps://www.w3schools.com/					
2. <u>ht</u>	ps://www.javatpoint.com/cloud-computing-tutorial					
3. <u>htt</u>	<u>ps://www.simplilearn.com/cloud-computing-tutorial-video</u>					
4. <u>ht</u>	tps://onlinecourses.nptel.ac.in/noc21_cs14/					
Course	e Outcomes	K Level				
CO1	Understand the functionality of the various cloud and services provided by	V2				
COI	them.	KJ				
CO2	Appreciate the strengths and limitations of various cloud models with	K2				
02	Virtualization	K3				
CO3	Explain and implementation of task Scheduling algorithms.	K3				
CO4	Describe different methodologies used in cloud and cloud services.	K4				
CO5	Build a private cloud	K4				
000	an an ar Ear an					

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	2	2	3	2	2	2
CO 3	3	2	3	3	2	2
CO 4	2	3	2	2	2	2
CO5	2	3	2	2	3	3

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

Unit	Cloud Infrastructure And Services	Hrs	Pedagogy
Ι	 Introduction: Cloud computing at a glance, Historical Developments, Building Cloud Computing Environments, Computing Platforms and Technologies. Principles of Parallel and Distributed Computing: Eras of Computing, Parallel Vs Distributed computing, Elements of ParallelComputing, Elements of Distributed Computing, Technologies for Distributed Computing. 	15	Chalk & Talk, ICT Kit
п	 Virtualization: Introduction, Characteristics of Virtualized Environments, Taxonomy of Virtualization Techniques, Virtualization and Cloud Computing, Pros and Cons of Virtualization, Technology Examples Cloud Computing Architecture: Introduction, Cloud reference model, Types of clouds, Economics of the cloud, open challenges. 	15	Chalk & Talk, ICT Kit
III	 Aneka: Cloud Application Platform: Framework Overview, Anatomy of the Aneka Container, Building Aneka Clouds, Cloud programming and Management. Concurrent Computing: Thread Programming : Introducing Parallelism for Single machine Computation, Programming Application with Threads, Multithreading with Aneka, Programming Applications with Aneka Threads. 	15	Chalk & Talk, ICT Kit
IV	 High- Throughput Computing: Task Programming: Task Computing, Task-based Application Models, Aneka Task-Based Programming. Data Intensive Computing: Map-Reduce Programming: Whatis Data-IntensiveComputing, Technologies for Data-Intensive Computing, Aneka MapReduce Programming. 	15	Chalk & Talk, ICT Kit
v	 High- Throughput Computing: Task Programming: Task Computing, Task-based Application Models, Aneka Task-Based Programming. Data Intensive Computing: Map-Reduce Programming: Whatis Data-IntensiveComputing, Technologies for Data-Intensive Computing, Aneka MapReduce Programming. 	15	Chalk & Talk, ICT Kit

Course Designed by Mrs. K.Sandya &Mrs.P.Rajeswari

Learning Outcome Based Education & Assessment (LOBE)										
	Formative Examination - Blue Print									
		Articulation	Mapping – K	Levels wi	th Course Ol	itcomes	(COS)			
			Sectio	n A	Section	B	Section C	Section D		
Inte	Cos	K L evel	MC	Qs	Short Ans	swers	Fither or	Onen		
rnal	005	K Level	No. of.	К-	No. of.	К-	Choice	Choice		
			Questions	Level	Questions	Level	Choice	Choice		
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	CO4	Up to 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			
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			
CIA	K3	-	-	10	10	20	40	40		
II	K4	-	-	10	10	20	40	40		
	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

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			MCQs Short Answers Section (No. of K No. of K		Short Answers		Section D	
5.110	0.08	K - Level	Questions	K – Level	Question	K – Level	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	ions to be	10		5		10	5	
	Aske	ed	10		3		10	3	
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	4.17	17		
K2	5	10	-	-	15	12.5	17		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	33.33	33		
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 (Multiple Choice Questions)					
Answer All	l Questi	ions	(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 (Short A	Answers)			
Answer All	l Questi	ions	(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 (Either/	Or Type)			
Answer All	l Questi	ions	(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: Highe	r level o	of perform	ance of the students is to be assessed by attempting higher level of		
K levels					
Section D (Open (Choice)			
Answer An	y Thre	e question	s (3x10=30 <u>marks</u>)		
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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	MACHINE LEARNI	NG				
Course Code	21UCSE62			L	Р	С
Category	Core Elective			5	-	5
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENU	J RSH	IP	✓
Course Objecti	ves:					
• To know the	ne basic concepts and tec	chniques of Machine Learni	ng.			
• To underst	and the Supervised and V	Unsupervised learning technology	niques.			
• To study th	e various probability ba	sed learning techniques.				
• To underst	and the Bayesian Conce	pt learning techniques.				
• To underst	and the supervised learn	ing techniques using classif	ication and Regres	ssion	meth	od.
Unit: I Int	roduction to Machine I	Learning			15	5
Introduction-	What is Machine Learnin	ng?-Types of Machine Lear	ning-Applications	of M	achir	ne
Learning-Tools	in Machine Learning-Iss	sues in Machine Learning.				
Preparing to Mo	del: Introduction-Machi	ine Learning Activities-Bas	ic Types of Data in	n Mao	chine	
Learning-Explo	ring Structure of Data-D	Data Quality and Remediation	on-Data Pre-Proces	ssing.		
Unit: II Mo	delling and Evaluation	l			15	5
Selecting a Mod	lel-Training a Model (fo	r Supervised Learning)-Mo	del Representation	n and		
Interpretability-	Evaluating Performance	of a Model-Improving Per	formance of a Mod	del.		
Basics of Featu	re Engineering: Feature	e Transformation-Feature S	ubset Selection			
Unit: III Ove	erview of Probability				15	5
Importance of S	tatistical Tools in Machi	ine Learning-Concept of Pr	obability-Frequent	tist ar	d Ba	yesian
Interpretation-R	andom Variables-Some	Common Discrete Distribu	tions-Some Comm	ion C	ontin	uous
Distributions-M	ultiple Random Variable	es-Central Limit Theorem-I	Hypothesis Testing	g-Moi	nte Ca	arlo
Approximation.						
Unit: IV Bay	esian Concept Learnir	ng			15	5
Why Bayesian I	Methods are Important?-	Bayes' Theorem-Bayes' Th	neorem and Conce	pt Le	arnin	g-
Bayesian Belief	Network.					
Supervised Lea	rning: Classification M	Iodel-Classification Learnin	g Steps-Common	Class	ificat	ion
Algorithms.						
Unit: V Sup	pervised Learning and	Unsupervised Learning			15	
Supervised Lea	rning: Regression: Intr	roduction-Common Regress	sion Algorithms.			
Un Supervised	Learning:Introduction-	Unsupervisedvs Supervised	l Learning-Applica	ation	of	
Unsupervised L	earning-Clustering-Find	ing Pattern using Association	on Rule			
		,	Fotal Lecture Ho	urs	75H	rs
Books for Stud	y:					
1.SaikatDut	, Subramanian Chandra	mouli,AmitKumarDas,"Ma	chineLearning",Pe	earsor	n,201	9.
Books for Refe	rences:					
1. Stephen	Marsland, "MachineLearn	ing-AnAlgorithmicPerspect	ive",SecondEdition	•		
2. Chapman	nandHall/CRCMachineLe	earningandPatternRecognitio	nSeries,2014.			
3. EthemAl ries)",	paydin,"IntroductiontoM	achineLearning3e(Adaptive	ComputationandMa	achine	Lear	ningSe
/ '						

4	ThirdEdition,MITPress,2014. JasonBell "Machinelearning_	
ч.	HandsonforDevelopersandTechnicalProfessionals",FirstEdition,Wiley,2014.	
Web F	Resources:	
1.	www.geeksforgeeks.org/machine-learning/	
2.	www.tutorialspoint.com/machine_learning/index.htm	
3.	https://hackr.io/blog/best-machine-learning-books	
4.	https://jonathan-hui.medium.com/machine-learning-graphical-model-b68b0	c27a749
Cours	e Outcomes	K Level
CO1:	Understand the basic concepts and techniques of MachineLearning.	K3
CO2:	Apply different model on datasets and design suitable problem solutions.	K 3
CO3:	Study the various probability based learning techniques	K 3
CO4:	Apply specific supervised machine learning techniques for a particular Problem	K 4
CO5:	Understand the Supervised and Unsupervised learning techniques	K 4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	3	3	3	3	2
CO 2	2	2	2	2	2	2
CO 3	2	3	2	2	1	2
CO 4	3	2	3	1	2	1
CO5	2	2	3	2	2	1

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

LESSON PLAN

Unit	Machine Learning	Hrs	Pedagogy
I	Introduction– What is Machine Learning?-Types of Machine Learning-Applications of Machine Learning-Tools in Machine Learning-Issues in Machine Learning. Preparing to Model: Introduction-Machine Learning Activities- Basic Types of Data in Machine Learning-Exploring Structure of Data-Data Quality and Remediation-Data Pre-Processing.	15	Chalk &Talk,PPT
п	Selecting a Model-Training a Model (for Supervised Learning)- Model Representation and Interpretability-Evaluating Performance of a Model-Improving Performance of a Model. Basics of Feature Engineering: Feature Transformation-Feature Subset Selection	15	Chalk &Talk,PPT
ш	Importance of Statistical Tools in Machine Learning-Concept of Probability-Frequentist and Bayesian Interpretation-Random Variables-Some Common Discrete Distributions-Some Common Continuous Distributions-Multiple Random Variables-Central Limit Theorem-Hypothesis Testing-Monte Carlo Approximation	15	Chalk &Talk,PPT
IV	 Why Bayesian Methods are Important?-Bayes' Theorem-Bayes' Theorem and Concept Learning-Bayesian Belief Network. Supervised Learning: Classification Model-Classification Learning Steps-Common Classification Algorithms. 	15	Chalk &Talk,PPT
V	Supervised Learning: Regression: Introduction-Common Regression Algorithms. Un Supervised Learning:Introduction-Unsupervisedvs Supervised Learning-Application of Unsupervised Learning-Clustering-Finding Pattern using Association Rule	15	Chalk &Talk,PPT

Course Designed by: Mrs.P.Rajeswari, & Mrs.K.Sandya

	Learning Outcome Based Education & Assessment (LOBE)										
Articulation Mapping – K Levels with Course Outcomes (COs)											
			Sectio	on A	Section	B B	Section C	Section D			
Inte rnal	Cos	K Level	MC	Qs	Short Ans	swers	Either or	Onen			
	005		No. of.	К-	No. of.	К-	Choice	Choice			
			Questions	Level	Questions	Level					
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO4	Up to 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			
UA	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					
CIA	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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	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

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										
			MCC	utcomes ()s	(COs) Short An	swers	Section C	S. A. 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 as	ked with	the given K	level)			

		Dis	stribution of	Marks with	n K Leve]	
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	
	Questions)	Questions)				choice)	
K1	5		-	-	5	4.17	17
K2	5	10	-	-	15	12.5	17
K3	-	-	30	30	60	50	50
K4	-	-	20	20	40	33.33	33
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 (Multiple Choice Questions)								
Answer All	l Questi	ions	(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 (Short A	(Inswers)						
Answer All	Questi	ions	(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 (Either/	Or Type)						
Answer All	Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of					
K levels								
Section D (Open (Choice)						
Answer An	y Thre	e question	s (3x10=30 marks)					
Q.No		K Level	Questions					
21		K3						
22	CO2	K3						
23	<u>CO3</u>	K3						
24	CO4	K4						
25	CO5	K4						

Summative Examinations - Question Paper – Format



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

Course Name	SOFTWARE TESTIN	NG.	AND QUALITY ASS	UR	ANCE					
Course Code	21UCSE63					L	Р	С		
Category	Core Elective					5	-	5		
Nature of cours	se: EMPLOYABILITY	✓	SKILL ORIENTED	\checkmark	ENTREPRENU	RSH	IP	\checkmark		
Course Object	ives:	L								
To Introduce	ce the basic concepts of s	oftv	vare testing							
• To learn the	e types of bugs, testing le	evel	s with which the studer	nt ca	an very well ide	ntify	a bug	and		
correct as when it happen										
• To understand the knowledge on transaction flow testing and data flow testing techniques so that										
the flow of	the program is tested as	wel								
• To learn the	e domain testing, path tes	sting	g and logic based testin	g to	explore the tes	ting p	roce	SS		
easier.										
Io understand the concept of Testing and State Graphs. Init. I. Testing Objectives and Overview 15 Hours										
Testing Objectives and Overview Testing Objectives and Overview: Software structure and Software testing Dicho								IS model		
I esting Objectives and Overview: Software structure and Software testing Dichotomies – A model										
Unit: II The Texenemy of Puge										
The Taxonomy of Bugs' Mistakes bugs and failures – Flow Graphs and Path Testing' Path testing										
Basics Flow Graph – Arrive at Test Paths Instrumentation – Application of path testing										
Unit III Tr	Unit: III Transaction Flow Testing 15 Hours									
Transaction Flow Testing: Control flow chart and structure. Data and Transaction testing Software										
functionality ar	d Transactions Basics o	f D	ata flow testing – usag	ze –	Data Flow Dy	nami	c An	omaly		
detection – Dat	a Flow graph testing Tec	chni	ques – Strategies for D	Data	flow testing –	Test s	strate	gies –		
Application of I	Data flow testing.				U			C		
Unit: IV Do	main testing:					15	Hou	rs		
Domain testing	: Boundary value analysi	s –	Equivalent partitioning	- E	Soundary value	analy	sis vs			
Equivalent part	itioning – I/O Domain te	stin	g – Comparison testing	g —	Domains and Ir	terfac	e tes	ting –		
Domains and t	estability. Paths, Path I	Proc	lucts and Regular Exp	pres	sion: Concepts	- P	rocec	lure –		
Application – R	legular Expression and F	low	Anomaly Detection.							
Unit: V Lo	gic Based testing					15	Hou	rs		
Logic Based tes	sting: Decision tables – D	Deci	sion tables in Function	al te	esting – Decisio	n tabl	es in			
Structural testin	ng – Predicates and relat	tion	al operators – Boolean	ı alg	gebra – Test ca	se De	esign	using		
Boolean algebr	a – Prime implicants. St	tates	s, State Graphs and Tr	ans	action Testing:	Obje	ct or	iented		
systems and Sta	ate graphs – State graph -	– G	eneral Properties – Goo	od/l	Bad State Graph	1 – Bi	ıgs ir	State		
graph – The Ro	ble of State graph – Stra	itegi	es for State Graph bas	ed	testing – State	graph	base	ed test		
design- An example – Testability tips.										
Doolyg for St	l			10	tal Lecture Ho	urs	/5 H	rs		
DOOKS IOF Stud	iy:									
1. ArunkumarK	hannur, Software Testing	g – '	Techniques and Applic	atic	ons, Pearson, Ne	ew De	elhi, 2	2011.		
Books for Refe	erences:									

1. Boris Beizer, Software Testing Techniques, Dream Tech Press, New Delhi, 2005.

Academic Council Meeting Held On 20.04.2023

Page 151

2. Adit	2. Aditya Mathur.P, Foundations of Software Testing, 2 nd Edition, Pearson Education, New								
Dell	ni, 2013.								
3. Nina	a S. Godbole, Software Quality Assurance: Principles and Practice, 1st Edition, Al	lpha							
Scie	Science, United Kingdom, 2004								
Web Resources:									
1.	https://ebooks.lpude.in/computer_application/mca/term_3/DCAP503_SOFT	WARE_TE							
	STING AND_QUALITY_ASSURANCE.pdf								
2.	https://www.techbooster.co.in/images/mydock/b271553252e6b05e41bb6f116	<u>bf29628.pdf</u>							
3.	https://www.cs.purdue.edu/homes/apm/FoundationsBookSecondEdition/Slic	les/Consolid							
	atedSlides.pdf								
4.	https://mrcet.com/downloads/digital_notes/CSE/III%20Year/Software%20Testing%20								
	Methodologies.pdf								
Cours	e Outcomes	K Level							
CO1:	Understand the Software Structure and Software Testing Models	K3							
cor.	Understand and identify various software testing bugs and correcting them	V2							
CO2:	after knowing the consequences of the bug	K3							
	Understand and identify various software testing problems, and solve these								
CO3:	problems by designing and selecting software test models, criteria, strategies,	К3							
	and methods.								
COA	Analysis of Domain Values, Partitioning, Comparison in Testing a software	V A							
CO4:	to detect the flow of Anomalies	K 4							
COL	Performing Functional Testing using Control flow and transaction Flow	V A							
005:	D5: graphs.								

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	3	1	2	3	3
CO 2	2	2	3	2	2	3
CO 3	3	2	2	2	2	3
CO 4	1	3	2	2	3	3
CO5	1	3	2	2	3	3

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

LESSON PLAN

Unit	Software Testing and Quality Assurance	Hrs	Pedagogy
I	Testing Objectives and Overview: Software structure and Software testing Dichotomies – A model for testing Component testing – Integration testing testing – Regression testing Production testing.	15	Chalk & Talk, ICT Kit
II	The Taxonomy of Bugs: Mistakes, bugs and failures – Flow Graphs and Path Testing: Path testing Basics Flow Graph – Arrive at Test Paths Instrumentation – Application of path testing	15	Chalk & Talk, ICT Kit
ш	Transaction Flow Testing: Control flow chart and structure, Data and Transaction testing Software functionality and Transactions Basics of Data flow testing – usage – Data Flow Dynamic Anomaly detection – Data Flow graph testing Techniques – Strategies for Data flow testing – Test strategies – Application of Data flow testing	15	Chalk & Talk, ICT Kit
IV	Domain testing: Boundary value analysis – Equivalent partitioning – Boundary value analysis vs Equivalent partitioning – I/O Domain testing – Comparison testing – Domains and Interface testing – Domains and testability. Paths, Path Products and Regular Expression: Concepts – Procedure – Application – Regular Expression and Flow Anomaly Detection.	15	Chalk & Talk, ICT Kit
V	Logic Based testing: Decision tables – Decision tables in Functional testing – Decision tables in Structural testing – Predicates and relational operators – Boolean algebra – Test case Design using Boolean algebra – Prime implicants. States, State Graphs and Transaction Testing: Object oriented systems and State graphs – State graph – General Properties – Good/Bad State Graph – Bugs in State graph – The Role of State graph – Strategies for State Graph based testing – State graph based test design- An example – Testability tips.	15	Chalk & Talk, ICT Kit

Course Designed by: N.Hemavathi &Mr.M.Selvakumar

	Learning Outcome Based Education & Assessment (LOBE)										
	Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)										
			Sectio	on A	Section	B	Section C	Section D			
Inte	Cos	K L evel	MC	Qs	Short Ans	swers	Fither or	Onen			
rnal	0.05	K Level	No. of.	К-	No. of.	К-	Choice	Choice			
			Questions	Level	Questions	Level					
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)			
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)			
AII	CO4	Up to 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			
UA	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					
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					
CIA	K3	-	-	10	10	20	40	40				
II	K4	-	-	10	10	20	40	40				
	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

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										
			MCC	utcomes ()s	(COs) Short An	swers	Section C	S. A. 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 as	ked 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			
	Questions)	Questions)				choice)			
K1	5		-	-	5	4.17	17		
K2	5	10	-	-	15	12.5	17		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	33.33	33		
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 (Multip	le Choice (Questions)		
Answer All	l Questi	ions	(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 (Short A	Answers)			
Answer All	l Questi	ions	(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 (Either/	Or Type)			
Answer All	l Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of		
K levels					
Section D (Open (Choice)			
Answer An	Answer Any Three questions(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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	BIG DATA ANALYT	ICS	5					
Course Code	21UCSE64					L	Р	С
Category	Core Elective					5	-	5
Nature of course:	EMPLOYABILITY	√	SKILL ORIENTED	~	ENTREPRENEU	NEURSHIP 🗸		
Course Objecti	ves:							
 To provide an overview of an exciting growing field of big data analytics. To introduce the tools required to manage and analyze big data like Hadoop, NoSqlMap Reduce. To teach the fundamental techniques and principles in achieving big data analytics withscalability and streaming capability. To enable students to have skills that will help them to solve complex real-world problems for decision support. To understand the concept of MongoDB. 								
Init. I Intra	duction to Big Data					15 E	Iours	
Introduction to F Characteristics of definition – Other Data – A typical I Realms of Big Data Unit: II Big Data Big Data Analyti business from cap Analytics – Data S Analytics tool.	Data – Evolution of Big D characteristics of Data Ne Data Warehouse environm ta Types of Digital Data: Data Analytics cs: Big Data Analytics – C italizing on Big Data – To Science – Data Scientist –	Data - eed o ent – Class Class op ch Tern	- Definition of Big Data f Big Data – Traditiona - A typical Hadoop envi ssification of Digital Da sification of Analytics – allenges facing Big Dat ninologies used in Big I	a C 1 Bu iron 1 ta. \overline{Growta} \overline{Growta} \overline{Growta}	hallenges in Big D nsiness Intelligenc ment – Newthings eatest challenges the Importance of Big a Environment – B	Data – e (BI) s - Cha <u>15 H</u> hat pro g Data SASE -	Big D vs Bi anges Iours event	Data Ig -
Unit: III The	Big Data Technology I	Land	lscape			15 H	Iours	
The Big Data Tec – Need of NoSQL of SQL, NoSQL a Hadoop – Hadoop Solutions. Unit: IV Intro	chnology Landscape: No ? – Advantages of NoSQI and NewSQL. Hadoop: Fe distribution – Hadoopvs	SQL L – U eatur SQL	- Types of NoSQL Dat Jse of NoSQL in Indust es of Hadoop – Advanta - Integrated Hadoop S	taba ry – ages yste	ise - SQL vsNoSQL – s of Hadoop – Ove em – Cloud-Based	- Comperview Hado	pariso of op Iours	on
Introduction to I	Introducing Hade	oop –	- Need of Hadoop - Nee	ed o	of RDBMS – RDB	MS		
vsHadoop – Distr Hadoop – Hadoop Application with	ibuted computing challenge distribution –HDFS – Pro Hadoop YARN – Interact	ges – ocess ing v	History of Hadoop – H sing data with Hadoop – with Hadoop Ecosystem	lado - Ma	op overview – Us anaging resources	e case and	of	
Unit: V Intro	oduction to MangoDB	& N	Iachine Learning			15 H	Iours	
Introduction to M MangoDB – Data Introduction to A Algorithms – Reg Rule Mining – De	MangoDB: What is Mang types in MangoDB -Mang Machine Learning: Intro ression Model – Linear Re ccision Tree.	oDB goDH ducti egres	– Why MangoDB – Te B querylanguage. ion – Machine Learning ssion – Clustering – Col	rms g De labo	s used in RDBMS finition – Machino prative Filtering –	and e Lear Assoc	ning viation	1

	Total Lecture Hours 7	5 Hrs
Books	for Study:	
1. Seer Unit I Unit II	na Acharya, Subhashini Chellappan, Big Data and Analytics, Wiley, 2015, New D Chapter 1(Full), Chapter 2.1 To 2.7, 2.9 To 2.13 - Chapter 3.2,3.5 To 3.8,3.10 To 3.14.	Delhi.
Unit II	I - Chapter 4(Full).	
Unit IV	7- Chapter 5(Full)	
Unit V	- Chapter 6(Full), Chapter 12(Full).	
Books	for References:	
1. DT	Editorial Services, Big Data, Black book, Ninth Edition, Dreamtech, 2016, New J	Delhi.
2. Mie 2016, 3. Fie	chael Minelli, Michele Chambers, AmbigaDhiraj, Big Data, Big Analytics, Wiley, New Delhi. ld Cady, The Data Science Handbook, Wiley, 1st Edition, 2017.	,
Web R	esources:	
Relate	d Online Contents (MOOC, SWAYAM, NPTEL, Websites etc.)	
1 http:		
2 http:	://www.ntnu.no/ije/fag/bjg/lessons/lesson1.ndf	
3 https	://www.tutorialsnoint.com/big_data_analytics/big_data_analytics_ndf_versid	n htm
5. <u>11(1)</u>	with the sponte of the second se	
Course	e Outcomes	K Level
CO1	Understand the key issues in big data management and its associated applications in intelligent business and scientific computing.	K3
CO2	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.	K3
CO3	Interpret business models and scientific computing paradigms, and apply software tools for big data analytics.	К3
CO4	Achieve adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.	K4
CO5	Ability to understand and apply scaling up machine learning techniques and associated computing techniques and technologies	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	3	1	2	2	3	3
CO 2	2	2	3	2	2	3
CO 3	2	2	3	2	2	3
CO 4	2	3	2	2	2	3
CO5	2	3	2	2	2	3

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

LESSON PLAN

Unit	Big Data Analytics	Hrs	Pedagogy
I	 Introduction to Big Data: Characteristics of Data – Evolution of Big Data – Definition of Big Data Challenges in Big Data – Big Data definition – Other characteristics of Data Need of Big Data – Traditional Business Intelligence (BI) vs Big Data – A typical Data Warehouse environment – A typical Hadoop environment – Newthings - Changes - Realms of Big Data. Types of Digital Data: Classification of Digital Data. 	15	Chalk & Talk, ICT Kit
Π	Big Data Analytics: Big Data Analytics – Classification of Analytics – Greatest challenges that prevent business from capitalizing on Big Data – Top challenges facing Big Data – Importance of Big Data Analytics – Data Science – Data Scientist – Terminologies used in Big Data Environment – BASE –Analytics tool.	15	Chalk & Talk, ICT Kit
III	 The Big Data Technology Landscape: NoSQL – Types of NoSQL Database – Need of NoSQL? – Advantages of NoSQL – Use of NoSQL in Industry – SQL vsNoSQL – Comparison of SQL, NoSQL and NewSQL. Hadoop: Features of Hadoop – Advantages of Hadoop – Overview of Hadoop – Hadoop distribution – Hadoopvs SQL – Integrated Hadoop System – Cloud-Based Hadoop Solutions. 	15	Chalk & Talk, ICT Kit
IV	Introduction to Hadoop: Introducing Hadoop – Need of Hadoop – Need of RDBMS – RDBMS vsHadoop – Distributed computing challenges – History of Hadoop – Hadoop overview – Use case of Hadoop – Hadoop distribution –HDFS – Processing data with Hadoop – Managing resources and Application with Hadoop YARN – Interacting with Hadoop Ecosystem	15	Chalk & Talk, ICT Kit
V	Introduction to MangoDB: What is MangoDB – Why MangoDB – Terms used in RDBMS and MangoDB – Data types in MangoDB - MangoDB querylanguage. Introduction to Machine Learning: Introduction – Machine Learning Definition – Machine Learning Algorithms – Regression Model – Linear Regression – Clustering – Collaborative Filtering – Association Rule Mining – Decision Tree.	15	Chalk & Talk, ICT Kit

Course Designed byMrs.K.Sandya & Mrs.P,Rajeswari

		Learnin	ng Outcome I Formative E	Based Educ Examinatio	cation & Asse n - Blue Prin	essment t	(LOBE)			
	Articulation Mapping – K Levels with Course Outcomes (COs)									
			Section A		Section	B	Section C	Section D		
Inte	Cos	K I ovol	MC	Qs	Short Ans	swers	Fither or	Open		
rnal	CUS	K Level	No. of.	К -	No. of. K -		Choice	Choice		
			Questions	Level	Questions	Level		CHOICE		
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	CO4	Up to 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	estion 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		

		Dist	ribution of 1	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	
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	
CIA	K3	-	-	10	10	20	40	40
II	K4	-	-	10	10	20	40	40
	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

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

S	Summativ	ve Examination	on – Blue Pri	int Articu	lation Map	ping – K	Level with (Course	
			MCC	utcomes ()s	(COs) Short An	swers	Section C		
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		ions to be red	10		5		5	3	
Marks for each question		ch 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	Section A	Section B	Section C	Section D	Total	% of	Consolidated		
Level	(Multiple	(Short	(Either/ or	(Open	Marks	(Marks	%		
	Choice	Answer	Choice)	Choice)		without			
	Questions)	Questions)				choice)			
K1	5		-	-	5	4.17	17		
K2	5	10	-	-	15	12.5	17		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	33.33	33		
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 (Multip	le Choice (Questions)
Answer All	l Questi	ions	(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 (Short A	(Inswers)	
Answer All	l Questi	ions	(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 (Either/	Or Type)	
Answer All	l Questi	ions	(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: Higher	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open (Choice)	
Answer An	y Thre	e questions	s (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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	OPEN SOURCE TE	CHNOLOGIES				
Course Code	21UCSE65			L	Р	C
Category	Core Elective			5	-	5
Nature of cours	se: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENU	JRSH	IP	✓
Course Object	ives:	II	II			<u> </u>
To knov	w the basic concept and '	Fechniques Client Server c	omputing.			
• To prov	vide a basic idea of Open	source technology, their s	oftware developme	nt pro	ocess	to
underst	and the role and future o	f open source software in t	he industry.	•		
• To und	lerstand the concepts of o	open source technology eth	ics.			
To reco	gnize the benefits and fe	atures of Open Source Tec	hnology and to inte	erpret	,	
contrast	t and compare open sour	ce products among themse	lves.			
• To unde	erstand the concept of O	pen Source Technology Etl	nics.			
Unit: I In	troduction to Open Sou	rce Technologies			15	;
Introduction-W	hyOpenSource-OpenSo	urce-Principles,Standards	Requirements,Succ	esses	-Fre	e
Software–FOSS	S-Internet Application P	rojects				
Unit: II Op	en Source Technology	Methodologies			15	;
Open Source	Fechnology Methodolog	gies: Open source – Initiati	ves, Principles, Me	ethodo	ologie	ès,
Philosophy, Pla	tform, Freedom, OSSD,	Licenses-Copyright, Copy	left, Patent, Zero	Marg	inal	
Technologies, I	ncome generation oppor	tunities, Internalization.				
Unit: III Ca	se Studies of Linux, Mo	ozilla(Firebox)			15	;
CaseStudies-	-Apache,BSD,Linux,N	lozilla(Firefox),Wikiped	ia,Joomla,GCC,C)penC	Office) .
Unit: IV Op	en Source Technology	Hardware and Design			15	;
Open Source P	roject –Starting, Maintai	ning - Open Source - Hard	lware, Design, Tea	ching	&am	ıp;
Media.						
Unit: V Op	en Source Technology	Ethics			15	;
Open Source	Ethics – Open Vs Clo	osed Source – Governme	ent – Ethics – Imp	oact o	of Op	en
Source Techr	ology-Shared Softwar	e-Shared Source.				
			Total Lecture Ho	urs	75 H	[rs
Books for Stud	ly:					
1.KailashVader	a,BhavyeshGandhi,"Ope	enSourceTechnology",Laxi	niPublicationsPvtL	.td201	12,1st	tEdi
tion.					,	
Books for Refe	erences:					
2. Fadi P.Deel	kand James A.M.McHug	h, "Open Source: Technol	ogy and Policy", C	ambri	dge	
Universities	s Press 2007.					
2. Open Sour	ce Technology, Kalash Y	adera, Bhabesh Gandhi, L	akshmi Publicatior	ns Pvt	Ltd.,	,
First Edition,	2019.					
3. Introduction	to open source system, N	Vaira Shah, Orange Books	Publication, First E	ditio	n, 202	21.
Web Resource	s:					
1. <u>https://</u>	www.coursera.org/lear	n/open-source-software-d	evelopment-meth	<u>ods</u>		
2. <u>https://</u>	www.slideshare.net/pri	vakb532/open-source-tec	<u>hnology-37688490</u>			
<u></u>						
Academic C	Council Meeting Held O	n 20.04.2023		Pag	ge 16	3

3.	https://www.slideserve.com/zeke/an-introduction-to-open-source-software-	
	powerpoint-ppt-presentation	
Course	e Outcomes	K Level
CO1:	Understand the students about Open Source Technology method	K3
CO2:	Implement Open Source Method using Principles and Platforms	K3
CO3:	Do Case Study of Apache, Linux,	K3
CO4 :	Understand Open Source Design and Hardware.	K 4
CO5 :	Know Open Source ETHICS.	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	2	2	3	3	3
CO 2	2	3	2	2	2	3
CO 3	3	3	2	2	1	3
CO 4	3	2	3	1	2	3
CO5	2	3	3	2	3	3

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

LESSON PLAN

Unit	Open Source Technologies	Hrs	Pedagogy
I	Introduction – Why Open Source – Open Source –Principles, Standards Requirements,Successes –Free Software–FOSS–Internet Application Projects	15	Chalk & Talk, ICT Kit
II	Open Source Technology Methodologies: Open source – Initiatives, Principles, Methodologies, Philosophy, Platform, Freedom, OSSD,Licenses–Copyright, Copyleft, Patent, Zero Marginal Technologies, Incomegenerationopportunities,Internalization	15	Chalk & Talk, ICT Kit
III	CaseStudies – Apache, BSD, Linux, Mozilla(Firefox), Wikipedia, Joomla, GCC, OpenOffice.	15	Chalk & Talk, ICT Kit
IV	Open Source Project –Starting, Maintaining –Open Source – Hardware, Design, Teaching & amp; Media	15	Chalk & Talk, ICT Kit
V	Open Source Ethics – Open Vs Closed Source – Government – Ethics – Impact of Open Source Technology–Shared Software–Shared Source.	15	Chalk & Talk, ICT Kit

Course Designed by: Mr.M.Selvakumar & Mrs. N.Hemavathi

Learning Outcome Based Education & Assessment (LOBE)									
Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)									
Inte rnal			Section A		Section B		Section C	Section D	
	Cos	K Level	MC	Qs	Short Ans	swers	Either or	Onen	
	005		No. of.	К -	No. of.	К-	Choice	Choice	
			Questions	Level	Questions	Level		Choice	
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)	
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)	
AII	CO4	Up to 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	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		
СІА	K2	2	6	-	-	8	16			
	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			
CIA	K3	-	-	10	10	20	40	40		
II	K4	-	-	10	10	20	40	40		
	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

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)										
			MCQs		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	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		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)		

	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				
	Questions)	Questions)				choice)				
K1	5		-	-	5	4.17	17			
K2	5	10	-	-	15	12.5	17			
K3	-	-	30	30	60	50	50			
K4	-	-	20	20	40	33.33	33			
Marks	10	10	50	50	120	100	100			
K2 K3 K4 Marks	5 - - 10	10 - - 10	30 20 50	30 20 50	15 60 40 120	12.5 50 33.33 100	17 50 33 100			

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

Section A (Multip	le Choice (Questions)		
Answer All	l Questi	ions	(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 (Short A	(Inswers)			
Answer All	l Questi	ions	(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 (Either/	Or Type)			
Answer All	l Questi	ions	(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: Higher	r level (of perform	ance of the students is to be assessed by attempting higher level of		
K levels					
Section D (Open (Choice)			
Answer An	Answer Any Three questions(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 SCIENCE (For those who joined in 2021-2022 and after)

Course Name	CLIENT SERVER C	OMPUTING							
Course Code	21UCSE66			L	Р	С			
Category	Core Elective			5	-	5			
Nature of cours	e: EMPLOYABILITY	✓ SKILL ORIENTED	✓ ENTREPRENU	RSH	IP	✓			
Course Objecti	ves:								
 To know 	the basic concept and T	echniques Client Server co	omputing.						
• To understand the Components of client/server computing.									
To know	• To know about Client Hardware and Software, Server Hardware and Environment.								
• To learn	Server Operating System	ns and Server Requiremen	ts.						
To know	Data Management and	Access Tools and Server A	Architecture.						
Unit: I Overview of Client/Server Applications									
Overview of Cl	ient/Server Computing	-Query language architect	ure -Original client	/serve	er				
application -Dis	tribution of processing in	n client/server model -Grov	wth in installed mic	cros a	nd				
LANs-Centraliz	ed and decentralized con	trol -Evolution of Client/S	Server Computing-O	Capac	ities	of			
processors									
Unit: II Overview of Client/Server Applications									
Overview of C	lient/Server Application	ns-Components of client/se	erver computing-C	lient/s	serve	r			
division of dutie	s-Classes of client/serve	r applications-The foundat	ion for electronic						
communication-	Understanding client/ser	ver computing-Representation	tive system config	uratic	on-				
Components of	an open systems environ	ment.							
Unit: III					15	;			
Client Hardwa	re and Software-possib	ble software a client machin	ne-sample GUI scr	een-X					
window system	architecture-Client Req	uirements-Basic principle	s of effective GUI	desig	n-AI	ľ			
libraries for eacl	n GUI environment-Ope	n Interface architecture-Bu	isiness specific ser	ver-C	ross				
business server-	Application server-Data	server and compute server	-Server Environn	nent-	Eight				
categories of ser	ver software								
Unit: IV Ser	ver Operating systems				15	,			
Server Operat	ing systems-OS/2 2.0 su	pported interface and appl	ication- OS/2 2.0 la	yered	1				
architecture-Wi	ndows NT supported inte	erfaces and applications-se	rver requirments	-Two	phas	e			
commit-Locking	g rules-Comparison of M	licrosoft's ODBC and proj	prietary database ac	ccess-	How				
remote procedui	e calls work.								
Unit: V Ser	ver Data Management	and Access Tools		19	15)			
Microsoft SQL	Server architecture-Net	ware SQL architecture-SY	BASE Open Clien	t/Serv	ver				
architecture-Ov	erview of Networking-H	Protocols and interfaces-O	pen Systems Interc	onnec	tion	•			
Model-LAN sof	tware functionality TCP	/IP architecture-System Ne	etwork architecture	mode	el-Po	ınt-			
to-point and mu	to-point and multi drop networks-star, bus, and ring topologies.								
			Total Lecture Ho	urs	75 H	rs			
BOOKS IOP Stud	y: m Commutin - D	De Tressie Destine The	McCas II'll I	7.4:4:		202			
Client/Serve	Client/Server Computing, Dawna Travis Dewire, Tata McGraw-Hill Edition 2003,								
Fourteenth r									
1 Client St	rver Computing Dr M.	nach (Trivadi Vhanna D	ublishing house Se	hoond	E4:+3	ion			
	a ver Computing, Dr.Mu	nesh C. Hiveui, Khaima P	ionsning nouse, Se		Luit	.011,			
Academic C	ouncil Meeting Held O	n 20.04.2023		Pag	ge 16	8			
2. An Introduction to Client Server Computing, Subash Chandra Yadav, Sanjay Kumar Singh, 2016.

3. Client Server Computing, Dr.S.T.Deepa, Mrs.T.Yegammai, Charulatha Publication, 2019. Web Resources:

- 1. https://www.tutorialspoint.com/Client-Server-Computing
- 2. <u>https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Dawna+Travis+D</u> ewire%22

3. https://www.tutorialspoint.com/Client-Server-Computing

Course	e Outcomes	K Level
CO1:	Overview of Client/Server Computing Technology	K3
CO2:	Understanding the Client/Server Application	K3
CO3:	Understanding the Client Hardware and Software Client Requirements	K3
CO4:	Overview Server Operating System Server Requirements	K4
CO5:	Types of Networks Server Data Management and Access Tools Overview of Networking	K4

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	1	1	3	3	3	3
CO 2	2	2	3	2	2	3
CO 3	3	3	1	2	2	3
CO 4	2	3	3	1	2	3
CO5	2	2	3	2	3	3

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

Unit	Client Server Computing	Hrs	Pedagogy
I	Overview of Client/Server Applications- Components of client/server computing-Client/server division of duties-Classes of client/server applications-The foundation for electronic communication-Understanding client/server computing-Representative system configuration-Components of an open systems environment.	15	Chalk & Talk, ICT Kit
п	Overview of Client/Server Applications- Components of client/server computing-Client/server division of duties-Classes of client/server applications-The foundation for electronic communication-Understanding client/server computing-Representative system configuration-Components of an open systems environment.	15	Chalk & Talk, ICT Kit
ш	Client Hardware and Software-possible software a client machine- sample GUI screen-X window system architecture-Client Requirements-Basic principles of effective GUI design-API libraries for each GUI environment-Open Interface architecture-Business specific server-Cross business server-Application server-Data server and compute server-Server Environment-Eight categories of server software	15	Chalk & Talk, ICT Kit
IV	Server Operating systems-OS/2 2.0 supported interface and application-OS/2 2.0 layered architecture-Windows NT supported interfaces and applications-server requirments-Two phase commit-Locking rules-Comparison of Microsoft's ODBC and proprietary database access-How remote procedure calls work	15	Chalk & Talk, ICT Kit
v	Microsoft SQL Server architecture-Netware SQL architecture- SYBASE Open Client/Server architecture- Overview of Networking- Protocols and interfaces-Open Systems Interconnection Model-LAN software functionality TCP/IP architecture-System Network architecture model- Point-to-point and multi drop networks-star, bus, and ring topologies.	15	Chalk & Talk, ICT Kit

LESSON PLAN

Course Designed by: Mr. M. Selvakumar & Mrs. N. Hemavathi

Learning Outcome Based Education & Assessment (LOBE)										
	Formative Examination - Blue Print Articulation Manning – K Levels with Course Outcomes (COs)									
		Articulation	Sectio	n A	Section	B				
Inte	Cos	K L ovol	МС	Qs	Short Ans	swers	Section C	Section D		
rnal	Cos	K Level	No. of.	К -	No. of.	К-	Choice	Choice		
			Questions	Level	Questions	Level	0110100	CHOICE		
CI	CO1	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AI	CO2	Up to K3	2	K1,K2	2	K2	2(K3,K3)	1(K3)		
CI	CO3	Up to K3	2	K1,K2	1	K2	2(K3,K3)	1(K3)		
AII	CO4	Up to 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		
CIAI	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				
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				
CIA	K3	-	-	10	10	20	40	40			
II	K4	-	-	10	10	20	40	40			
	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

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)									
			MCQ	2s	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 C	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 Marks for each section			10		10		25	30		
(Figures i	n parenthesis	s denotes. au	estions sl	ould be ask	ed with	the given K l	evel)		

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			
	Questions)	Questions)				choice)			
K1	5		-	-	5	4.17	17		
K2	5	10	-	-	15	12.5	17		
K3	-	-	30	30	60	50	50		
K4	-	-	20	20	40	33.33	33		
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 (Multip	le Choice (Questions)
Answer All	Questi	ions	(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 (Short A	(Inswers)	
Answer All	Questi	ions	(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 (Either/	Or Type)	
Answer All	Questi	ions	(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: Highe	r level o	of perform	ance of the students is to be assessed by attempting higher level of
K levels			
Section D (Open C	Choice)	
Answer An	y Thre	e question	s (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 SCIENCE (For those who joined in 2021-2022 and after)

Course Code 21UCSSP6 L	Р	С					
Category Skill -	2	2					
Nature of course:EMPLOYABILITYImage: Mail Content of Course of	HIP	✓					
Course objectives:							
• Recall the basics of OOP and translate the variables in Python.							
• Manipulate the variables and statements using Loops, Function, and Strings.							
 Choose the method to reduce source code metrics with exception. Create a program using OOP and additional features of Pathon 							
 Simplify the code by utilize the control statement and Modules 							
S. No. List of Programs	Ног	ırs					
1. To display student details.							
2. To demonstrate working with dictionaries in python.							
3. To Write a program that inputs a text file. The program should print all of the unique							
words in the file in alphabetical order.							
4. To write a Program that takes command line arguments (word count).							
5. To perform read and write operations on a file.							
6. To write a program to implementing electricity billing.							
7. To display a calculator.							
8. To convert Kilometers to Miles.							
9. To find addition of two matrix using for loop.							
10. To construct star (*) pattern using loop.							
Total Hours	60						
Books for study							
1. E.Balagurusamy," Problem Solving and Python Programming", McGraw Hill Education Pri	vate						
Limited, India, First Edition, 2018.							
Books for References:	Casar	Tee					
1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press, 2015							
 Charles Dierbach, "Introduction to Computer Science Using Python", 1st Edition, Wiley India Pvt 							
Ltd. 3. Wesley J Chun, "Core Python Applications Programming" 3rd Edition Pearson Education	India	1.					
2015.	inut	•,					
4. Roberto Tamassia, Michael H Goldwasser, Michael T Goodrich, "Data Structures and Algo	orithm	ns in					

Python", 1st Edition, Wiley India Pvt Ltd, 2016.

5. ReemaThareja, "Python Programming using problem solving approach", Oxford University press, 2017.

Web Resources:

- 1. https://studyglance.in/labprograms/pythondisplay.php
- 2. https://studyglance.in/labprograms/pythonlabprograms.php
- 3. https://www.practicepython.org/

Course	Course Outcomes			
CO1:	Explain basic principles of Python programming language	K3		
CO2:	Explain basic principles of Python programming language	K3		
CO3:	Implement database and GUI applications.	К3		
CO4:	Be able to do basic programming in python	K4		
CO5:	Gain knowledge on CGI	K4		

CO & PO Mapping:

COS	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO 1	2	2	3	3	1	3
CO 2	3	3	2	3	2	3
CO 3	2	3	3	2	2	3
CO 4	2	2	1	3	3	3
CO5	3	3	2	1	3	3

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

LESSON PLAN

S. No.	List of Programs	Hours	Mode
1.	To display student details.		
2.	To demonstrate working with dictionaries in python.		
3.	To Write a program that inputs a text file. The program should print all of		
	the unique words in the file in alphabetical order.		
4.	To write a Program that takes command line arguments (word count).		Black Board, Lab Demonstrati
5.	5. To perform read and write operations on a file.		
6.	To write a program to implementing electricity billing.		on and LCD Projector.
7.	To display a calculator.		
8.	To convert Kilometers to Miles.		
9.	To find addition of two matrix using for loop.		
10.	To construct star (*) pattern using loop.		
	Total Hours	60	

Course Designed by: K. Sandya & Mrs. P. Rajeswari