Department of Computer Technology

Syllabus

2021 – 2024 Batch

DEPARTMENT OF COMPUTER TECHNOLOGY

Syllabus

BATCH: 2021 – 2024

Faculty Members

Dr. M. Rajasenathipathi, M.C.A., M. Phil.,Ph.D.,

Ms. C. Keerthana, M.Sc., M. Phil., (Ph.D).,

Ms. K. S. Leelavathi, M.Sc., M. Phil., NET., SET., (Ph.D).,

Dr. R. Jayaprakash, M.C.A., M.Phil., Ph.D.,

Ms. A. Kalaivani, M.C.A., M. Phil., (Ph.D).,

Nallamuthu Gounder Mahalingam College

An Autonomous Institution affiliated to Bharathiar University

Re-Accredited by NAAC and ISO 9001:2015 Certified Institution

Pollachi – 642 001.

NGM College

Vision

Our dream is to make the college an institution of excellence at the national level by imparting quality education of global standards to make students academically superior, socially committed, ethically strong, spiritually evolved and culturally rich citizens to contribute to the holistic development of the self and society.

Mission

Training students to become role models in academic arena by strengthening infrastructure,upgrading curriculum, developing faculty, augmenting extension services and imparting quality education through an enlightened management and committed faculty who ensure knowledge transfer, instill research aptitude and infuse ethical and cultural values to transform students into disciplined citizens in order to improve quality of life.

Department of Computer Technology

Vision

To continue to be the Premier Department for Computer Technology and to becomeregionally top-ranked and nationally recognized for Academic Excellence

Mission

- To offer a broad-based education, encourage lifelong learning, foster teamwork, promote creativity, discovery and competitiveness
- To turn out highly qualified graduates into world-class professionals capable of competing in the IT Arena as well as in a research environment

Program Educational Objectives:

PEO1	Demonstrating the concepts and technologies of Software Industry
PEO2	Motivate to select one domain knowledge and develop smart software solutions as per industry standard
PEO3	Focus to solve real time problems in terms of various technologies.
PEO4	Understand the concepts of software project life cycle during software development.
PEO5	Apply the knowledge of various levels of security in computer field.

Program Outcomes:

PO1	Under Graduate students are to apply, algorithmic, real time and Industry standard reasoning to a variety of computational problems
PO2	Understand the fundamental knowledge of various domains in IT Industry and change their currier as per industry Demand.
PO3	Combine the knowledge of mathematics and Software Technologies in the field of Software project development
PO4	Implement industry standard projects of their own choice using latest tools.
PO5	Improve the aptitude skill to clear various levels of entrance exams in their currier.
PO6	The Under Graduate students are recognize the Human Excellence and ethical responsibilities through yoga in various disciplines
PO7	Demonstrate global Industry demand related subjects and transferable skills that are relevant to global industry and employment opportunities
PO8	Graduates will recognize the need for self-motivation to update in technologies to be in par with changing technology
P09	Ability to analyze the local and global impact of computing on individuals, organizations and society.
P10	Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

Program Specific Outcomes:

PSO – 01	Acquire academic excellence with professional skill for employment and higher studies.
PSO – 02	Create, select and apply modern tools and techniques to analyze and develop successful software in IT Industry.

Nallamuthu Gounder Mahalingam College - Curriculum Development Cell
Scheme of Examination For 2021 - 2022
Choice Based Credit System & OBES

For Part I and Part II in First & Second Semesters Only

SEMESTER – I

Part	Subject Code	Title of the Paper	Hrs / Week		Hrs / Sem.	Exam Hrs.	Maximum Marks		Total Marks	Credits
			L	P	T		Internal	External		
I	21UTL101 / 21UHN101 / 21UFR101	Tamil Paper - I /	6	-	-	3	50	50	100	3
		Hindi Paper - I /	6	-	-					
		French Paper - I	6	-	-					
II	21UEN101	Communication Skills – I (Level I)	5	-	-	3	50	50	100	3
	21UEN102	Communication Skills – I (Level II)	5	-	-					
III	21UCT101	CORE - I : Programming in C	4	-	-	3	50	50	100	4
	21UCT102	CORE II: Digital Fundamentals and Computer Organization	4	-	-	3	50	50	100	4
	21UCT1A1	ALLIED I: Mathematics - I: Mathematical Structures For Computer Science	5	-	-	3	50	50	100	4
	21UCT103	CORE LAB -I : Programming in C	-	4	0	3	25	25	50	2
IV	21UHR101	Human Rights	1	-	-	2	-	50	50	2
	21HEC101	Human Excellence - Personal Values & SKY Yoga Practice – I	1	-	-	2	25	25	50	1
V		Extension Activities – Annexure I	-	-	-	-	-	-	-	-
CC	21CFE101	Fluency in English - I	-	-	-	-	-	-	-	-
		Online Course **(Optional)** (MOOC / NPTEL / SWAYAM)								Grade
Total			**26**	**4**	**0**	**22**	**300**	**350**	**650**	**23**

SEMESTER – II										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
I	21UTL202 / 21UHN202 / 21UFR202	Tamil Paper - II /	6	-	-	3	50	50	100	3
		Hindi Paper - II /	6	-	-					
		French Paper - II	6	-	-					
II	21UEN202	Communication Skills – II (Level I)	5	-	-	3	50	50	100	3
	21UEN203	Communication Skills – II (Level II)	5	-	-					
III	21UCT204	CORE III: Object oriented Programming with C++	4	-	-	3	50	50	100	4
	21UCT205	Core - IV :Data Structures	4	-	-	3	50	50	100	4
	21UCT2A2	Allied - II : Mathematics II – Operations Research	4	-	-	3	50	50	100	4
	21UCT206	Core Lab - II : Programming in C++ with data Structures	-	4	-	3	25	25	50	2
IV	21EVS201	Environmental Studies	2	-	-	2	-	-	50	2
	21HEC202	Human Excellence - Family Values & SKY Yoga Practice - II	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE202	Fluency in English – II	-	-	-	-	-	-	-	-
	21CMM201	Manaiyiyal Mahathuvam - I	1	-	-	2	-	50	50*	Grade
	21CUB201	Uzhavu Bharatham – I	1	-	-	2	-	50	50*	Grade
		Online Course (Optional) (MOOC / NPTEL / SWAYAM)								Grade
Total			**26**	**4**	**-**	**26**	**300**	**350**	**650**	**23**

SEMESTER – III										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	21UCT307	Core V: Java Programming	5		6	3	50	50	100	4
	21UCT308	Core VI: Database Management System	5		8	3	50	50	100	4
	21UCT309	Core VII: Operating Systems	5		4	3	50	50	100	4
	21UCT3A3	Allied - III : Software Engineering	5		6	3	50	50	100	4
	21UCT310	Lab - III :Java Programming Lab	-	4	0	3	50	50	100	2
	21UCT311	Lab-IV: Database Management System Lab	-	4	0	3	25	25	50	2
IV	21UCT3N1 / 21UCT3N2	Non Major Elective - I : HTML Lab / Multimedia Lab	1	-	-	2	-	50	50	2
	21HEC303	Human Excellence - Professional Values & Ethics – III	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE303	Fluency in English – III	-	-	-	-	-	-	-	–
	21CMM302	Manaiyiyal Mahathuvam - II	1	-	-	2	-	50	50*	Grade
	21CUB302	Uzhavu Bharatham – II	1	-	-	2	-	50	50*	Grade
Total			**22**	**8**	**24**	**28**	**300**	**300**	**600**	**23**

SEMESTER – IV										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**		
III	21UCT412	Core VIII: Advanced Java Programming	5		4	3	50	50	100	4
	21UCT413	Core IX: Linux And Shell Programming	5		4	3	50	50	100	4
	21UCT414	Core X: Data Communication And Networks	5		3	3	50	50	100	4
	21UCT4A4	Allied IV: Big Data Management	5		3	3	50	50	100	4
	21UCT415	Lab - V: Advanced Java Programming Lab		4	0	3	50	50	100	2
	21UCT416	Lab - VI : Linux And Shell Programming Lab		4	0	3	50	50	100	2
IV	21UCT4N1/ 21UCT4N2	Non-Major Elective II - Office Automation Lab / CorelDraw Lab	1	-	-	2	_	50	50	2
	21HEC404	Human Excellence - Social Values & SKY Yoga Practice -IV	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	50	50	1
CC	21CFE404	Fluency in English – IV	-	-	-	-	-	-	-	_
	21CMM403	Manaiyiyal Mahathuvam – III	1	-	-	2	-	50	50*	Grade
	21CUB403	Uzhavu Bharatham – III	1	-	-	2	-	50	50*	Grade
Total			**22**	**8**	**14**	**28**	**325**	**425**	**750**	**24**

SEMESTER – V										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**	**100**	
III	21UCT517	CORE XI: Open Source Technologies	6	-	2	3	50	50	100	5
	21UCT518	CORE XII: Information Security	6	-	2	3	50	50	100	5
	21UCT5E1 / 21UCT5E2 / 21UCT5E3	Core Elective - I :Cloud Computing / Embedded Systems / Management Information System	6		2	3	50	50	100	5
	21UCT519	LAB -VII: Open Source Technologies	-	5	0	3	50	50	100	2
	21UCT520	LAB - VIII: Web Designing	-	4	0	3	50	50	100	2
	21UCT5AL	Advanced Learner Course - I **:** Software Testing- Self Study (**Optional**)	SS		-	3	50	50	100	4*
	21UCT5VA	VAC I- IoT (Internetof Things) (Mandatory)	30 Hrs		2	-	25	25	50	2*
IV	21UCT5S1 / 21UCT5S2	Skill Based Major Elective - I : Python Lab / HTML5 With CSS Lab	2 Hours			2	25	25	50	3
	21HEC505	Human Excellence - National Values & SKY Yoga Practice – V	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE505	Fluency in English - V	-	-	-	-	-	-	-	–
	21CSD501	Soft Skills Development – I	-	-	-	-	-	-	-	Grade
	21GKL501	General Awareness - Self Study (Online) (SBE) (Optional)	SS		_	2	-	50	50*	Grade
Total			**19**	**11**	**6**	-	**300**	**350**	**650**	**23**

SEMESTER – VI										
Part	**Subject Code**	**Title of the Paper**	**Hrs / Week**		**Hrs / Sem.**	**Exam Hrs.**	**Maximum Marks**		**Total Marks**	**Credits**
			L	**P**	**T**		**Internal**	**External**	**100**	
III	21UCT621	Core - XIII : Framework Technology	6	-	8	3	50	50	100	4
	21UCT6E1 / 21UCT 6E2/ 21UCT 6E3	Core Elective - II : Mobile Computing / Software Project Management / Grid Computing	6	-	4	3	50	50	100	5
	21UCT 6E4 / 21UCT 6E5 / 21UCT 6E6	Core Elective - III : Artificial Intelligence / Under water Communication / Digital Image Processing	6	-	4	3	50	50	100	4
	21UCT622	Core Lab - IX : Framework Technology	-	5	0	3	50	50	100	3
	21UCT623	Project	-	4	0	-	50	50	100	4
	21UCT6AL	Advanced Learner Course - II : Data Analytics (Optional) - Self Study	SS		-	3				
	21UCT6VA	VAC-II:PC Assembly and CCTV camera Installation (Mandatory)	30Hrs		2	-				
IV	21UCT6S1 / 21UCT6S2	Skill Based Major Elective - II : Data Analytics (Big Data) Lab / Dreamweaver Lab	-	2	0	2	25	25	50	3
	21HEC606	Human Excellence - Global Values & SKY Yoga Practice – VI	1	-	-	2	25	25	50	1
V		Extension Activities - Annexure I	-	-	-	-	-	-	-	-
CC	21CFE606	Fluency in English - VI	-	-	-	-	-	-	-	-
	21CSD602	Soft Skills Development - II	-	-	-	-	-	-	-	Grade
Total			**19**	**11**	**16**	-	**300**	**300**	**600**	**24**
Grant Total							**1750**	**2150**	**3900**	**140**

AL – Advanced Leaner Course (Optional); VA – Department Specific Value Added CourseCC – Certification Course / Co - Scholastic Course * - Extra Credits & Extra Hour Course

Grand Total = 3900; Total Credits = 140

Question Paper Pattern (Based on Bloom's Taxonomy)

K1-Remember; K2- Understanding; K3- Apply; K4-Analyze; K5- Evaluate

1. Theory Examinations: 70 Marks (Part I, II, & III)

(i) Test- I & II, ESE:

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define/Short Answer)	10 x 1 = 10	MCQ Define	70 **(Reduced to 50 for ESE)**
K3 (Q 11-15)	B (Either or pattern)	5 x 4 = 20	Short Answers	
K4 & K5 (Q 16 – 21)	C (Q -16 is Compulsory and Q 17 – 21 answer any 3)	4 x 10 = 40	Descriptive/ Detailed	

2. Theory Examinations: 50 Marks (Part IV)

Knowledge Level	Section	Marks	Description	Total
K1 & K2 (Q 1 -10)	A (Q 1 – 5 MCQ) (Q 6–10 Define / Short Answer)	10 x 1 = 10	MCQ Define	50 **(Reduced to 25 for ESE)**
K3, K4 & K5 (Q 11-18)	B (Answer 5 out of 8)	5 x 8 = 40	Short Answers	

3. Practical Examinations: 100/50 Marks

Knowledge Level	Criterion	External/Internal Marks	Total
K3	Record work & Practical	50/50	100
K4		25/25	50
K5			

*** In Theory ESE, Students will write Examination Maximum Marks as 70 and it will be reduced to50 for Total Mark calculation.**

Components of Continuous Assessment

THEORY

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test 1	(70 / 4.67) = 15	15+15+10+05+05	50
Test 2 / Model	(70 / 4.67) = 15		
Assignment / Digital Assignment	10		
Seminar / Socratic Seminar	05		
Group Task : GD, Role Play, APS	05		

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test / Model	10	10+5+5+5	25
Assignment / Digital Assignment	5		
Seminar / Socratic Seminar	5		
Group Task : GD, Role Play, APS	5		

PRACTICAL

Maximum Marks: 50; CIA Mark: 25

Components		Calculation	CIA Total
Test / Model	15	15+5+5	25
Observation Note	5		
Record	5		

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Test / Model	30	30+5+15	50
Observation Note	5		
Record	15		

Maximum Marks: 200; CIA Mark: 100

Components		Calculation	CIA Total
Test / Model	60	60+10+30	100
Observation Note	10		
Record	30		

PROJECT

Maximum Marks: 100; CIA Mark: 50

Components		Calculation	CIA Total
Review I	10	10+10+10+20	50
Review II	10		
Review III	10		
Report Submission	20		

Maximum Marks: 200; CIA Mark: 100

Components		Calculation	CIA Total
Review I	20	20+20+20+40	100
Review II	20		
Review III	20		
Report Submission	40		

** Components for 'Review' may include the following:*

Originality of Idea, Relevance to Current Trend, Candidate Involvement and Presentation of Report for Commerce, Management & Social Work.

Synopsis, System Planning, Design, Coding, Input form, Output format, Preparation of Report & Submission for Computer Science cluster.

STUDENT SEMINAR EVALUATION RUBRIC

Grading Scale:

A	B	C	D
5	4	2 - 3	0 - 1

CRITERIA	A - Excellent	B - Good	C - Average	D - Inadequate
Organization of presentation	Information presented as interesting story in logical, easy to follow sequence	Information presented i nlogical sequence; easy to follow	Most of information presented in sequence	Hard to follow; sequence of information jumpy
Knowledge of subject & References	Demonstrated ful lknowledge; answered all questions with elaboration **&** Material sufficie ntfor clear understanding **AND** exceptionally presented	At ease; answered all questions **but** failed t o elaborate **&** Material sufficient fo rclear understandin g **AND** effectively presented	At ease with information; answered most questions **&** Material sufficient for clear understanding **but** not clearly presented	Does not have grasp of informatio n;answered only rudimentary Questions **&** Materialnot clearly related totopic **OR** background dominated seminar
Presentation Skills using ICT Tools	Uses graphics that explain and reinforce text and presentation	Uses graphics that explain tex tand presentation	Uses graphics that relate to text and presentation	Uses graphics thatrarely support text and presentation
Eye Contact	Refers to slides to make points; engage dwith audience	Refers to slidesto make points; ey econtact majority of time	Refers to slides to make points; occasional eye contact	Reads most slides; no or just occasional eye contact

Elocution – (Ability to speak English language)	Correct, precise pronunciation of all terms Voice is clear and steady; audience canhear well at all times	Incorrectly pronounces few terms Voice is clear with few fluctuations; audience ca nhear well most of the time	Incorrectly pronounces some terms Voice fluctuates from low to clear; difficult tohear at times	Mumbles and/o rIncorrectly pronounces some terms Voice is low; difficultto hear

WRITTEN ASSIGNMENT RUBRIC

Grading Scale:

A	B	C	D	F
09 - 10	07- 08	05 - 06	03 - 04	01 - 02

CRITERION	A - Excellent	B - Good	C - Average	D - Below Average	F - Inadequate
Content & Focus	Hits on almost all content exceptionally clear	Hits on most key points and writing is interesting	Hits in basic content and writing is understandable	Hits on a portion of content and/or digressions and errors	Completely off track or did not submit
Sentence Structure & Style	* Word choice is rich and varies * Writing style is consistently strong * Students own formal language	* Word choice is clear and reasonably precise * Writing language is appropriate to topic * Words convey intended message	* Word choice is basic * Most writing language is appropriate to topic * Informal language	* Word choice is vague * Writing language is not appropriate to topic * Message is unclear	* Not adequate
Sources	Sources are cited and are used critically	Sources are cited and some are used critically	Some sources are missing	Sources are not cited	Sources are not at all cited
Neatness	Typed; Clean; Neatly bound in a report cover; illustrations provided	Legible writing, well-formed characters; Clean and neatly bound in a report cover	Legible writing, some ill-formed letters, print too small or too large; papers stapled together	Illegible writing; loose pages	Same as below standard
Timeliness	Report on time	Report one class period late	Report two class periods late	Report more thanone week late	Report move than 10 days late

Continuous Internal Assessment for Project

For Computer Science Cluster

Maximum Marks: 50 Marks

Criterion	Mode of Evaluation	Marks	Total
I	Synopsis, Company Profile, System Specification, Existing System, Proposed System OR (For Android Developments) Planning Stage	10	50
II	Supporting Diagrams like system flowchart, ER, DFD, Usecase and Table Design OR UI and UX Design Application Architect and Prototyping	10	
III	Coding, Input forms, Output format, Testing OR Development, Testing	10	
IV	Preparation of Report & Submission	20	

External Assessment: 50 Marks

Mode of Evaluation	Marks	Total	Grand Total
Project Report			50
Title Relevance of the Industry/Institute	05	30	
Technology	05		
Design and development Publishing	10		
Testing, Report	10		
Viva Voce			
Project Presentation	10	20	
Q&A Performance	10		

Name and signature of Principal
(Dr.R.Muthukumaran)
Dr. R. MUTHUKUMARAN,
M.A.,M.Phil.,B.Ed.,Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001.
Coimbatore District

HOD Signature
Dr. M. RAJASENATHIPATHI M.A.,M.C.A.,M.Phil.,Ph.D.
Head of the Department
Department of Computer Technology
Nallamuthu Gounder Mahalingam College (Autonomous)
POLLACHI - 642 001.

SEMESTER- I

Programme Code:	B.Sc.			Programme Title:	Bachelor of Science (Computer Technology)	
Course Code:	21UCT101			Title	Batch:	2021 - 2024
				Title	Semester:	I
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	-	CORE I: PROGRAMMING IN C	Credits:	4

Course Objective

To focus on the language and syntax of C programming concepts.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember data types, identifier, arrays, strings and pointers	K1
CO2	To understand how to write and use control statements and functions in C	K2
CO3	To implement the concept of pointers, structure and union	K3
CO4	To evaluate string functions and file Operations in Cprogramming for agiven application	K4
CO5	To evaluate random file operations, preprocessor and command line arguments	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	M	L	H	M	M	M	M	M	M
CO2	H	L	H	M	M	M	L	M	M	M	M	M
CO3	H	H	M	M	L	H	H	H	L	H	M	H
CO4	H	M	H	H	H	M	H	H	H	H	L	H
CO5	M	M	L	H	M	H	M	M	M	M	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to C** :Overview of C – History and Importance of C – Basic Structure ofC programs -Development of program logic skills through Flowchart and Algorithm – Programming Style– Executing a'C'program – Character set –C Tokens–Keywords – Identifiers – Constants– Variables – Rules for defining variables- Data types, – Declaring and initializing variables–Operators & Expressions–Precedence of arithmetic – Type conversion in expressions– Mathematical functions – **Managing Input and output operations**: Introduction – Readinga character–Writing a character Formatted input-Formatted output Simple Programs	12
Unit II	**Control Statements:** IF, IF..ELSE Statements, ELSE...IF ladder – Switch Statement – GOTO Statement – WHILE Statement – Do Statement – FOR Statement.-Jumps in loops. **Arrays:** One dimensional Arrays – Two Dimensional Arrays –simple Structures: Arrays within Structures–Union.	12
Unit III	**Functions:** User-defined functions- -Elements of user defined function, definition of function - Return value &their types, function calls &declarations-Category of functions: No arguments & No return values-arguments that No return values – Arguments with return values-No arguments that return a value-Nesting of functions-Recursion	12
Unit IV	**String manipulation:** Introduction- Declaring & Initializing String variables –Reading string from terminal, Writing string to screen – String handling Functions. **Pointers:** Introduction - Accessing, Declaring & Initializing pointer Variables	12
Unit V	**Files:** Defining and opening a file – Closing a file –I/O operations on sequential file– Command line arguments- Programs using Files and CommandLine Arguments	12
	Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	E.Balagurusamy	Programming in Ansi C	Tata McGraw-Hill Publishing Co&Ltd.,SixthEdition	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Greg Perry, Dean Miller	C Programming – Absolute Beginner's Guide	Third Edition	2013
2	Yashvant Kanetkar	Let us C	17th Edition	2020

Web References

1. https://www.javatpoint.com/data-types-in-c
2. https://www.tutorialspoint.com/cprogramming/c_arrays.html
3. https://www.programiz.com/c-programming/c-functions
4. https://www.programiz.com/c-programming/c-pointers
5. https://www.geeksforgeeks.org/basics-file-handling-c/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K.S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			Programme Title:	Bachelor of Science (Computer Technology)	
Course Code:	21UCT102			Title	Batch:	2021 - 2024
				Title	Semester:	I
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	–	CORE II: DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION	Credits:	4

Course Objective

To convert the knowledge on digital circuits, logic gates and about interfacing of various components.

To cover the various digital components used in the Organization and Hardware design of digital computers

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect number system, Binary Codes concepts	K1
CO2	To understand the concepts of Boolean laws, logic gates, Karnaugh map for Minimization of POS and SOP form of Boolean expressions.	K2
CO3	To apply arithmetic and logic circuits, different sequential circuits with flipflops, registers.	K3
CO4	To analyze the concept of Register Organization, Data Transfer and Manipulation, Registers and Memory Organization.	K4
CO5	To evaluate memory hierarchy and types of memory	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	L	H	M	H	H	M	M	M
CO2	H	L	H	M	M	M	L	M	M	M	H	M
CO3	H	H	L	M	L	M	H	H	L	H	M	H
CO4	H	L	H	H	H	M	H	M	H	H	L	H
CO5	M	M	L	H	M	H	M	M	M	M	H	L

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Number Systems and Binary Codes: Digital Electronics – Integrated circuits or Chip - Decimal System - Binary system – Octal System – Hexadecimal System – Binary addition – Binary Multiplication and Division – 1's Complement of a binary Number-9's Complement - 10's Complement - BCD – Gray Code - Excess-3 Code — Alphanumeric codes – Parity method for error detection and correction.	12
Unit II	Boolean Algebra-Logic Gates– Karnaugh Map and Minimization: Boolean Algebra – Gates – Inverter or NOT Gate – OR Gate – AND Gate – NOR Gate – NAND Gate – De Morgan's Theorems – Exclusive OR Gate – Exclusive NOR Gate – Karnaugh Map – Canonical Form I – Karnaugh Map - Construction and Properties – Minimization of SOP form using Karnaugh map - Minimization of POS form using Karnaugh map.	12
Unit III	Arithmetic and Logic circuits: Half Adder – Full Adder — Half- Subractor – Full-Subtractor - Sequential Circuits, Flip-Flops: Flip-Flops- R-S Flip- Flops- Positive Edge Triggered J-K Flip-Flop- Registers: Register – Decoder – Encoder – Multiplexer – Demultiplexer.	12
Unit IV	Central Processing Unit: General Register Organization – Stack Organization – Instruction Formats – Data Transfer and Manipulation – Reduced Instruction Set Computer (RISC).	12
Unit V	Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.	12
	Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Puri.V.K	Digital Electronics Circuits and Systems	22nd Reprint, TATA Mc-Graw Hill Publications, ISBN-10: 0- 07- 463317-1.	2011
2	Morris Mano. M	Computer System Architecture	3rd Edition	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Donald P Leach, Albert Paul Malvino, Gautam Saha	Digital Principles and Applications	7th Edition, TATA McGraw-HillPublications.	2010
2	Mandal S K	Digital Electronics: Principles and Applications	1st Edition, ISBN-13:978-0070153820.	2017
3	Saini S.P.S	Computer System Architecture and Organization	S. K. Kataria & Sons Publication, ISBN-13:978-8189757731	2015
4	Hamacher.C, Zvonko.V, Zaky.S	Computer Organization	5thEdition Tata Mc Graw Hill Publication, ISBN-13:9781259005275	2017

Web References

1. https://circuitglobe.com/number-system-in-digital-electronics.html
2. https://www.tutorialspoint.com/digital_circuits/digital_circuits_logic_gates.html
3. https://www.tutorialspoint.com/digital_circuits/digital_circuits_flip_flops.html
4. https://www.tutorialspoint.com/computer_fundamentals/computer_cpu.htm
5. https://www.tutorialsmate.com/2020/04/types-of-computer-memory.html

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT1A1			**Title**	**Batch:**	2021 - 2024
				ALLIED 1: MATHEMATICS – I - MATHEMATICAL STRUCTURE FOR COMPUTER SCIENCE	**Semester:**	I
Lecture Hrs./Week or Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	–		**Credits:**	4

Course Objective

To gain knowledge of the concepts of matrices, algebraic equations, numerical differentiation, integration and correlation for computer applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember an in-depth knowledge in Matrices, Determinants, Inverse of a matrix, Rank of a Matrix and Eigen value Problems	K1
CO2	To understand the concepts of numerical differentiation and integration	K2
CO3	To apply an appropriate numerical method for solving algebraic	K3
CO4	To figure out the concept of Mean, Median, Mode, Measures of dispersion and the law relating to Correlation and Regression	K4
CO5	To evaluate the concept of correlation and correlation evaluation regression	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	M	L	H	M	H	H	M	M	M
CO2	M	H	H	M	M	M	L	M	H	H	H	M
CO3	H	H	L	H	L	M	H	H	L	H	L	H
CO4	L	L	H	H	H	M	H	M	H	H	L	H
CO5	M	M	L	L	M	H	M	M	H	M	H	L

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Matrices** – Introduction – Determinants – Inverse of a matrix – Rank of a Matrix – EigenValue problems	15
Unit II	**System of Simultaneous Linear algebraic Equation:** Gauss elimination, Gauss Jordan. **The solution of Numerical Algebraic and Transcendental equation** – Bisection method – Newton Raphson method.	15
Unit III	**Numerical Differentiation:** Newton's forward Difference - Backward Difference – **Startling formula Numerical Integration**: Trapezoidal Rule and Simpson's rule - **Numerical solution of ordinary differential equations:** Taylor method.	15
Unit IV	**Measures of central tendency:** Mean (Individual Series), Median Discrete Series) and Mode (Continuous Series) – Relationship among mean, median and mode. Case study: Calculate mean, median and mode for students mark list. **Measures of dispersion:** Range, quartile deviation, mean deviation and Standard deviation.	15
Unit V	**Correlation**: Karl Pearson's coefficient of correlation – **Rank correlation regression:** Regression Equations – Difference between Correlation and Regression.	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Dr. Venkataraman. M. K	Engineering Mathematics	Volume II, Third Edition, NPC – (UnitI).	2001
2	Kandasamy.P, Thilagavathi.K, Gunavathi. K	Numerical Methods	Revised Edition, New Delhi, S. Chand and Company Ltd, ISBN-13: 9788121914383.	2006
3	Pillai.R.S.N, Bagavathi.V	Statistical Methods	New Delhi, Sultan Chand and Sons Company Limited, (Unit IV &V).	2005

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	N. P. Bali., Dr. Manish Goyal	A text book of Engineering Mathematics	Vol1, 9th edition, University science Press, New Delhi. ISBN- 9788131808320.	2010
2	Gupta .S.C, Kapoor .V.K	Fundamental of Mathematical Statistics	Sultan Chand and Sons-Tb,ISBN-13:9788180549687.	2018

Web references:

1. https://www.vedantu.com/maths/types-of-matrices
2. https://byjus.com/maths/gauss-elimination-method/
3. http://www.math.pitt.edu/~sparling/052/23052/23052notes/23052notestojan14th/node3.html
4. https://statistics.laerd.com/statistical-guides/measures-central-tendency-mean-mode-median.php
5. https://www.bmj.com/about-bmj/resources-readers/publications/statistics-square-one/11-correlation-and-regression

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT103			**Title**	**Batch:**	2021 - 2024
				LAB – I - PROGRAMMING IN C	**Semester:**	I
Lecture Hrs./Week or Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	–		**Credits:**	2

Course Objective

On successful completion of this subject the students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember the concept of data types, decision making and looping control statements	K1
CO2	To get the idea of array, strings and functions in C	K2
CO3	To access the file information through open/close and reading/writing operations in a file	K3
CO4	To remember the concept of pointers	K4
CO5	To get the idea of file functions	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	M	M	L	H	M	H	H	M	H	M
CO2	M	M	H	L	M	M	L	H	H	H	H	M
CO3	H	H	L	H	H	M	H	H	L	H	L	H
CO4	L	H	H	H	H	H	H	M	H	H	L	H
CO5	M	M	L	L	M	H	M	L	H	M	H	L

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Write a C program to illustrate the concept of operators in C. 2. Write a C program to illustrate the concept of conditional and unconditional control statements. 3. Write a C program to illustrate the concept of Arrays. 4. Write a C program to illustrate the concept of string and its functions. 5. Write a C program to illustrate the concept of Functions. 6. Write a C program to illustrate the concept of call by value. 7. Write a C program to illustrate the concept of call by reference. 8. Write a C program to illustrate the concept of pointers. 9. Write a C program to illustrate the concept of File and its Operations. 10. Write a C program to illustrate the concept of Command line Arguments.	60
Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K.S Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

SEMESTER- II

Programme Code:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT204			**Title**	**Batch:**	2021 - 2024
				CORE III: OBJECT ORIENTED PROGRAMMING WITH C++	**Semester:**	II
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	–		**Credits:**	4

Course Objective

To provide in-depth coverage of object-oriented programming principles and techniques in C++.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect keywords, tokens, data types, oops concepts and control structuresin C++	K1
CO2	To understand the design issues involved with variable allocation and binding, functions, classes and objects	K2
CO3	To apply features of object oriented programming to solve real world problems using constructors, destructors and operator overloading concepts	K3
CO4	To interpret the concepts of pointers, managing console I/O operators and file operations in C++	K4
CO5	To evaluate the concepts of file open modes , file pointers and their manipulators	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	L	H	M	H	H	M	M	M
CO2	M	M	H	L	MH	M	L	H	H	H	H	M
CO3	H	H	L	H	H	M	H	M	L	H	L	H
CO4	L	H	M	H	H	H	H	M	H	H	L	H
CO5	M	M	L	L	M	H	M	L	H	M	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Principles of Object-Oriented Programming: Procedure-Oriented Programming – Object- Oriented Programming Paradigm – Basic Concepts of OOP – Benefits of OOP. Beginning with C++: Structure of C++ program. Tokens, Expressions and Control structures : Tokens – Keywords – Identifiers - Data types – Declaration of Variables – Dynamic Initialization of Variables – Reference Variables – Operators – Scope Resolution Operator – Expressions - Operator Precedence – Control Structures.	12
Unit II	Functions in C++: The Main () Function – Function Prototype – Call by Reference – Return by Reference - Inline Functions – Default Arguments – Function Overloading – Friend and Virtual Functions. Classes and Objects: Specifying Class – Defining Member Functions – Private Member Functions – Array with a Class – Static Data Members – Static Member Functions – Array of Objects – Objects as Function Arguments – Returning Objects – Const Member Functions.	12
Unit III	**Constructors and Destructors:** Constructors – Parameterized Constructors – Multiple Constructors in a class – Copy Constructors - Dynamic Constructors – Destructors. **Operator Overloading and Type Conversion:** Defining Operator Overloading Function – Overloading Unary Operators – Overloading Binary Operators – Overloading Operators with Friend Functions – Rules for OverloadingOperators.	12
Unit IV	**Inheritance:** Defining Derived Classes – Types of Inheritance – Virtual Base Classes – Abstract Classes – Nesting of Classes. **Pointers, Virtual Functions and Polymorphism:** Pointers to Objects – this Pointer – Pointers to Derived Classes – Virtual Function - Pure Virtual Functions.	12
Unit V	Managing Console I/O Operators: C++ Streams – Stream Classes – Unformatted I/O Operator – Formatted Console I/O Operations. Working with Files: Classes for File Stream Operations – Opening and Closing a File – Detecting end–of-File - File Open Modes – File Pointers and Their Manipulators.	12
	Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	BalaGurusamy .E	Object Oriented Programming with C++	6th edition TMH Publication, ISBN-13: 9781259029936.	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Kyle Loudan	C++ - The Complete Reference	4th Edition	2017
2	Yashavant Kanetkar	Let us C++	-	2020
3	John R Hubbard	Programming with C++	3rdEdition, MH Publication	2009
4	Bhushan Trivedi	Programming with Ansi C++	Oxford University Press, ISBN-13:9780198063087.	2010

Web references:

1. https://www.tutorialspoint.com/basic-concepts-of-object-oriented-programming-using-cplusplus
2. https://www.geeksforgeeks.org/classes-objects-java/#:~:text=Classes%20and%20Objects%20are%20basic,around%20the%20real%20life%20entities.
3. https://www.tutorialspoint.com/cplusplus/cpp_constructor_destructor.htm
4. https://www.geeksforgeeks.org/inheritance-in-c/
5. https://www.w3schools.in/cplusplus-tutorial/working-with-files

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT205			**Title**	**Batch:**	2021 – 2024
				CORE IV: DATA STRUCTRES	**Semester:**	II
Lecture Hrs./Week or Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	–		**Credits:**	4

Course Objective

To understand the concepts of array, stack, queue, list, linked list, tree and their computer applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To remember arrays, stack/queue operations and trees	K1
CO2	To understand and develop skills to analyze simple linear and non linear datastructures	K2
CO3	To apply the concept of linked lists, graphs and trees for the realworldproblems	K3
CO4	To evaluate file organizations, various searching and sorting methodologies	K4
CO5	To apply the concept of Binary trees	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	L	H	M	H	H	M	M	M
CO2	M	H	H	L	H	M	L	H	H	M	H	M
CO3	H	H	L	H	H	L	H	M	L	H	L	H
CO4	L	H	M	H	H	H	H	M	H	H	M	H
CO5	M	M	L	L	M	H	M	L	H	M	H	M

*H-High; M-Medium; L-Low

21UCT205

Units	Content	Hrs
Unit I	**Introduction** - Definition – Structure and properties of Algorithms – Development of an Algorithm – Data structures and Algorithms – Data structure – Definition and Classification. **Arrays:** Introduction – Array Operations - Number of elements in an array, representation of Arrays in memory, Applications	12
Unit II	Stacks: Introduction – Stack Operations – Applications .Queues: Circular Queues – Other types of Queues – Applications.	12
Unit III	Linked Lists: Introduction – Singly Linked Lists – Circular Linked Lists – Doubly Linked Lists – Applications.	12
Unit IV	**Trees**: Introduction – Trees – Basic Terminologies - Representation of Trees. **Binary Trees**: Basic Terminologies and Types - Representation of Binary Trees - Binary Tree Traversals – Applications. **Graphs**: Introduction – Definition and basic Terminologies.	12
Unit V	File Organizations: Introduction – Files - Keys – Basic File Operations – Sequential File Organizations – Indexed sequential File Organizations – Direct File Organizations. Searching: Linear search– Binary search. Sorting: Merge sort and Quick sort.	12
	Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	GAV Pai	Data Structures and Algorithms – Concepts, Techniques and Applications	Tata MCGrawHill Publications	2011

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Aaron M Tanenbaum, Yedidyeh langsam, Moshe J Augenstein,	Data Structure using C	Facsimile Edition, Pearson India, ISBN-13:978-8131702291.	2018
2	Ashok N Kamthane	Programming and Data Structures	PearsonEducation, 1st Indian Print, ISBN-13:978-131724224.	2009

Web references:

1. https://www.w3schools.in/cplusplus-tutorial/working-with-files/
2. https://www.javatpoint.com/ds-stack-vs-queue
3. https://www.javatpoint.com/ds-linked-list
4. https://www.javatpoint.com/binary-tree
5. https://www.javatpoint.com/bubble-sort

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT2A2			**Title**	**Batch:**	2021 - 2024
				ALLIEDII: MATHEMATICS – II - OPERATIONS RESEARCH	**Semester:**	II
Lecture Hrs./Week or Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	–		**Credits:**	4

Course Objective

Every industrial organization faces multifaceted problems to identify best possible solution to their problems. OR aims to help the executives to obtain optimal solution with the use of OR techniques and to locate best or optimal solution.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect the modeling tools and computational tools as well as analytic skills to evaluate the problems.	K1
CO2	To understand how to translate real world problem given in words into a mathematical formulation.	K2
CO3	To apply mathematical optimization techniques, existing optimization tool kits to write computer programs and to implement algorithms and solve problems.	K3
CO4	To analyze the problem situation leading to better control, better co-ordination, better systems and finally better decisions.	K4
CO5	To analyze the concept of CPM and PERT	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	L	H	M	H	H	M	M	H
CO2	M	M	H	L	MH	M	L	H	H	H	H	M
CO3	H	H	L	H	H	M	H	M	L	H	L	H
CO4	L	H	M	H	H	H	H	M	H	H	L	L
CO5	M	M	L	L	M	H	M	L	H	M	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Linear Programming Problem: Graphical Solution Method- General Linear Programming Problem (Definition alone) - Canonical and Standard forms of LPP. Simplex Method: Basic Solution and Degenerate Solutions to Linear Equation- Simplex Method.	12
Unit II	Transportation Problem: North West Corner Method- Least Cost Method- Vogel's Approximation Method- Moving towards optimality UV Method. Assignment Problem: Definition- Assignment Algorithm.	12
Unit III	Inventory Control: Introduction – Types of Inventory – Inventory Decision- Economical Order Quantity (EOQ) - Deterministic Inventory Problems.	12
Unit IV	Sequencing Problems: Introduction- Problems with n Jobs and 2 Machines- Problems with n Jobs and k Machines.	12
Unit V	Network Scheduling: Introduction- Network and Basic Components- Rules of Network Construction- Time calculation in Networks-CPM-PERT- PERT Calculations- Difference between CPM and Pert Network.	12
	Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	KantiSwarup, P.K.Gupta, Man Mohan	Operations Research	Sultan Chand & Sons, Seventh Edition	1996

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	R. Paneer Selvam,	Operation Research	Prentice Hall of India Pvt Ltd, second edition	-

Web references:

1. https://ncert.nic.in/ncerts/l/lemh206.pdf
2. https://www.mygreatlearning.com/blog/transportation-problem-explained/
3. https://www.researchgate.net/publication/245280760_Deterministic_Inventory_Models_for_Variable_Production
4. https://link.springer.com/chapter/10.1007%2F978-3-662-08011-5_10
5. https://en.wikipedia.org/wiki/Network_congestion

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: MS. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT206			**Title**	**Batch:**	2021 - 2024
				LAB – II: PROGRAMMING IN C++ WITH DATA STRUCTURES	**Semester:**	II
Lecture Hrs./Week or Practical Hrs./Week	4	**Tutorial Hrs./Sem.**	–		**Credits:**	2

Course Objective

To develop the programming ability in C++ by knowing the OOPS concepts like Encapsulation, Abstraction, Inheritance, Polymorphism, Exception handling.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect the structure of the C++ programming language	K1
CO2	To understand how to implement copy constructors and class member conceptofdataabstractionandencapsulationandtooverloadfunctionsandoperators in C++	K2
CO3	To access how inheritance promote code reuse, how virtual functions implement dynamic binding with polymorphism.	K3
CO4	To access how to design and implement generic classes with C++ templates and how to use exception handling in C++ programs	K4
CO5	To understand about command line arguments and function templates	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	L	H	M	M	H	M	M	H
CO2	M	H	H	L	H	M	L	H	H	M	H	M
CO3	H	H	L	H	H	L	H	M	L	H	L	H
CO4	L	H	M	M	H	H	H	M	H	H	M	H
CO5	M	M	L	L	M	H	M	L	H	M	H	M

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Write a C++ program to illustrate the concept of operators and Expressions. 2. Write a C++ program to illustrate the concept of Functions in C++. 3. Write a C++ program to illustrate the concept of Function Overloading. 4. Write a C++ program to illustrate the concept of Classes and objects. 5. Write a C++ program to illustrate the concept of Constructors. 6. Write a C++ program to illustrate the concept of Destructors. 7. Write a C++ program to illustrate the concept of Overloading unary and binary Operators. 8. Write a C++ program to illustrate the concept of Inheritance. 9. Write a C++ program to illustrate the concept of Files and File stream operations 10. Write a C++ program to illustrate the concept of File pointers.	60
Total Contact Hours	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

SEMESTER- III

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT307			**Title**	**Batch:**	2021 – 2024
				CORE V: JAVA PROGRAMMING	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	06		**Credits:**	04

Course Objective

To provide profound coverage on classes, multithreading, exception handling, applets and file handling in Java.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember aboutclasses, objects, members of a class and relationships among them needed for a specific problem	K1
CO2	Comprehend the concepts of inheritance, interface and package	K2
CO3	Examine error handling techniques using exception handling	K3
CO4	Evaluate the concepts of thread, applet and files	K4
CO5	Developed skills in designing abstract window toolkit	K5

Mapping

PO /PSO / CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

21UCT307

Units	Content	Hrs
Unit I	**Java Evolution** – History Features and How Java differs from C and C++, Java support systems, Java environment – Overview of Java Language – Constants, Variables and Data Types - Operators and Expressions– Decision Making and Branching.	15
Unit II	Classes, Objects and Methods– Arrays, Strings and Vectors – Interfaces: Multiple Inheritances – Packages: Putting Classes Together.	15
Unit III	**Multithreaded Programming:** Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions. **Managing Errors and Exceptions**: Types of Errors – Exceptions – Syntax of Exception Handling Code.	15
Unit IV	**Applet Programming:** How Applets Differ From Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – Aligning the Display– Displaying Numerical Values – Getting Input From the User - Event Handling. **Graphics Programming –**The Graphics Class – Lines and Rectangles – Circles and Ellipses – Drawing Arcs.	15
Unit V	**Managing Input / Output Files in Java:** Concept of Streams – Stream Classes – Byte Stream Classes – Serialization – Character Stream Classes – Using Streams – Other Useful I/O Classes – Using the File Class – Creation of Files – Reading / Writing Characters –Handling Primitive Data Types – Concatenating and Buffering Files .	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Balagurusamy. E	Programming With JAVA A Primer	6th Edition, Tata McGraw Hill Publications, ISBN-13: 9780070141698.	2019

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	John R. Hubbard	Programming with Java	2nd Edition, Schaum's Outline Series, Tata McGraw Hill Publications, ISBN-13: 9780070589421.	2013
2	Timothy Budd	Understanding Object Oriented Programming with Java	2nd Edition, Pearson Education, ISBN-13: 9780201308815.	2016
3	Deitel&Deitel	Java TM: How to Program	9th Edition, PHI, ISBN-13: 9780136123712	2010

Web References

1. iiti.ac.in/people/~tanimad/JavaTheCompleteReference.pdf
2. http://www.onlineprogrammingbooks.com/learning-java-4th-edition/
3. https://www.javatpoint.com/serialization-in-java
4. https://www.journaldev.com/2452/serialization-in-java
5. https://www.tutorialspoint.com/java/index.htm

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT308			**Title**	**Batch:**	2021 – 2024
				CORE VI: DATABASE MANAGEMENT SYSTEM	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	08		**Credits:**	04

Course Objective

The learner would have to understood the fundamental concepts of database systems & use the features available in a DBMS package

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind Queries in a DBMS, Structure of a DBMSattributes and entity sets	K1
CO2	Comprehend deep knowledge about the basics of Relational Model and ACID properties	K2
CO3	Apply joins and set operators, control structures and embedded SQL for data management and retrieval techniques	K3
CO4	Analyze the basic issues of transaction processing, concurrency control and understand the importance of Normalization	K4
CO5	Familiarity on Parallel, Object Oriented & Distributed databases	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	M	H	M	H	H
CO3	H	M	H	M	H	M	H	M	H	M	H	L
CO4	M	H	M	H	L	H	M	H	L	H	M	M
CO5	H	L	H	L	H	M	H	L	H	M	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Overview of database systems: Managing data – A historical perspective file systems versus a DBMS – Advantages of a DBMS – Describing and storing data in a DBMS – Queries in a DBMS– Structure of a DBMS. Database design & ER diagrams – Entities attributes and entity sets – Relationships and Relationship sets – Additional features of the ER model – conceptual database design with the ER model.	15
Unit II	Relational Model: Integrity constrains over relations – Enforcing integrity constraints – Querying relational data – Logical database design; ER to relational introduction to views – Destroying / Altering Tables & Views. Relational algebra and calculus: Relational Algebra – Relational Calculus.	15
Unit III	SQL: Queries, Programming Triggers: The form of a basic SQL Query – UNION, INTERSECT and EXCEPT – Nested Queries – Aggregate operators – Null values – Complex integrity constraints in SQL – Triggers & Active data bases. Transaction Management Overview: The ACID properties – Transactions & Schedules – Concurrent execution of transactions – Lock-based concurrency control – performance of locking – Transaction support in SQL.	15
Unit IV	Schema Refinement and normal forms: Introduction to schema refinement – Functional dependencies – Reasoning about functional dependencies – Normal forms – Properties of Decompositions – Normalization – Schema refinement in data base design – Other kinds of dependencies. Security: Introduction to database security – Access control –	15

	Discretionary access control – Mandatory access control – Additional issues to security	
Unit V	Parallel & Distributed databases: Introduction – Architecture for parallel databases – Parallel Query evaluation – Parallel zing individual operations – Parallel query optimization – Introduction to distributed databases – Distributed DBMS architecture sorting data in a distributed DBMS. Object Database Systems: Motivation Example – Structured data types – Operation on structured data types – Encapsulation & ADTS – Inheritance – Objects, OIDS and reference Types – Database design for and ORDBMS – OODBMS – comparing RDBMS OODBMS and ORDBMS.	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Raghu Ramakrishnan, Johannes Gehrke	Database Management Systems	Third edition, McGraw-Hill Higher Education.	2014

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	ArunMajumdar and Pritimoy Bhattacharya	Database Management Systems	1st Edition, TMH, ISBN-13: 978-0074622391.	2017
2	Gerald V. Post	Database Management Systems	3rd Edition, TMH Publication, ISBN-13: 9780070635265	2018
3	Jonathan Gennick	Oracle SQLPlus Pocket Reference	2nd Edition, E.H. J. Pallett Publication, ISBN-13: 978-0596526887.	2019

Web References

1. http://freecomputerbooks.com/An-Introduction-to-Relational-Database-Theory.html
2. https://swayam.gov.in/nd2_cec19_cs05/preview
3. https://www.featuredcustomers.com
4. https://onlinecourses.nptel.ac.in/noc19_cs46/preview
5. https://www.slideshare.net/NILESHX/database-management-system-28774171

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT309			**Title**	**Batch:**	2021 – 2024
				CORE VII: OPERATING SYSTEMS	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	04		**Credits:**	04

Course Objective

To recognize the concepts and principles, techniques and approaches which constitute a coherent body of knowledge in operating systems.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind about operating system services, process, scheduling and memory allocations	K1
CO2	Comprehend the various process management concepts including scheduling, synchronization, and deadlocks	K2
CO3	Implement CPU Scheduling algorithms for process scheduling and deploy a deep knowledge about the memory management concepts including swapping, paging and segmentation	K3
CO4	Review synchronization problems, accessing methods in Files, Disk scheduling	K4
CO5	Demonstrate an understanding of different I/O techniques in operating system.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	M	M	H	H	H	H	H	H	H	H	L	H
CO2	H	M	H	M	H	M	H	H	M	H	M	H
CO3	M	M	H	M	H	M	H	L	M	H	M	H
CO4	M	H	M	H	L	H	M	M	H	M	H	M
CO5	M	L	H	L	H	M	H	H	M	H	M	L

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Introduction: What is an Operating System – Evolution of Operating system**Operating-System Structures**: System Components- Operating System Services –System Calls – System Programs – System Structure.	15
Unit II	**Process Management**: Process Concept – Process scheduling. **Threads:** Overview – Benefits- User and Kernel Threads- Multithreading Models. **CPU Scheduling**: Scheduling Criteria – Scheduling Algorithms. **Process Synchronization:** The Critical-Section Problem – Semaphores – Classic problems of Synchronization.	15
Unit III	**Deadlocks**: Deadlock Characterization – Methods for handling Deadlock – Deadlock prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlock – **Storage Management**: Swapping – Contiguous Memory allocation – Paging – Segmentation.	15
Unit IV	**Virtual memory**: Demand Paging –Page Replacement: FIFO Page Replacement – Optimal Page Replacement – LRU Page Replacement. **File-System Interface**: File concept – Access methods – Directory Structure.	15
Unit V	**File-System Implementation**: File System Structure – Allocation methods. **Mass Storage Structure:** Disk Structure – Disk Scheduling. **Case study:** Linux, Windows XP, Android OS (Memory management).	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Abraham Silberschatz, Peter Baer Galvin, Greg Gagne	Operating System Concepts	9th Edition, John Wiley and Sons, ISBN-13 9789812530554	2013

Reference Books

S.No	Author	Title of The Book	Publishers \ Edition	Year Of Publication
1	Achyut.SGodbole	Operating Systems	1st Edition, TMH Publications, ISBN- 9780070591134.	2010
2	H. M Deitel	Operating Systems	3rd Edition, Pearson Education Publication, ISBN 13: 9780536212153.	2012

Web References

1. http://nptel.ac.in/courses/106108101/13
2. https://developer.android.com/topic/performance/memory-overview.html
3. https://www.geeksforgeeks.org/operating-system-types-operating-systems-awaiting-author/
4. https://www.slideshare.net/ashanrajpar/operating-system-presentation-60556413
5. https://www.os-book.com/OS9/slide-dir/index.html

21UCT309

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT 3A3			**Title**	**Batch:**	2021 – 2024
				ALLIED III: SOFTWARE ENGINEERING	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	06		**Credits:**	04

Course Objective

To enhance the basic software engineering methods and practices and to learn the techniques for developing software systems

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind layers of process models, Requirement gathering phases design concepts and testing strategies	K1
CO2	Picture out the main aspects of software engineering and evaluate requirements for a software system and analyzing the requirements through modeling	K2
CO3	Apply the process of analysis and design using the object-oriented approach	K3
CO4	Interpret the design engineering and various Testing tactics	K4
CO5	Inculcate knowledge on Software engineering concepts in turn gives a roadmap to design a new software project.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to Software Engineering**: The evolving role of software - Changing Nature of Software - Software myths. **A Generic view of process**: Software engineering - A layered technology - a process framework - The Capability Maturity Model Integration (CMMI).**Process models**: The waterfall model -Incremental process models - Evolutionary process models.	15
Unit II	**System Engineering**: Computer-Based Systems – The system engineering Hierarchy. **Requirements Engineering:** A bridge to design and construction- Requirements Engineering Tasks – Initiating the Requirements Engineering Process - Eliciting Requirements – Building the Analysis Model.	15
Unit III	**Building the Analysis Model**: Requirement analysis – Analysis Modeling approaches – Data modeling concepts – Object-Oriented Analysis- Scenario-Based Modeling – Flow - Oriented Modeling – Class-Based Modeling – Creating a Behavioral Model.	16
Unit IV	**Design Engineering**: Design process and Design quality - Design concepts - the design model. **Creating an architectural design**: Software architecture - Data design - Architectural Design.	13
Unit V	**Testing Strategies**: Software Testing Lifecycle- Test strategies for conventional software, Validation testing, System testing - The art of Debugging. **Testing Tactics**: Black - Box and White-Box Testing - Basis path Testing – Control Structure Testing - Black-Box Testing. **Testing for Web Apps**: Performance testing: Performance testing objectives - Load testing – Stress Testing	16
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Roger S. Pressman	Software Engineering, A Practitioner's Approach	6th Edition, TATA McGraw-Hill Publications, ISBN-13 : 978-0071267823	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ian Sommerville	Software Engineering	9th Edition, Addison Wesley, ISBN-13: 978-0137035151	2010
2	Stephen Schacht	Software Engineering	7th Edition, New Delhi, Tata McGraw Hill Publishing Company, ISBN-13: 9780070647770.	2012

Web References

1. https://nptel.ac.in/courses/106/105/106105218/
2. https://swayam.gov.in/nd1_noc19_cs70/preview
3. https://freevideolectures.com/course/4071/nptel-software-project-management
4. https://www.nptelvideos.com/video.php?id=918
5. https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT310			**Title**	**Batch:**	2021 – 2024
				LAB – III - JAVA PROGRAMMING LAB	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	04	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To utilize java programming concepts for developing, compiling and running java applications and applets.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Java Programming with emphasis on ethics and principles of professional coding	K3
CO2	Demonstrate the creation of objects, classes and methods and the concepts of constructor, methods overloading, Arrays, branching and looping	K4
CO3	Create data files and Design a page using AWT controls and Mouse Events in Java programming Implement the concepts of code reusability and debugging.	K3
CO4	Develop applications using Strings, Interfaces and Packages and applets	K4
CO5	Construct Java programs using Multithreaded Programming and Exception Handling	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	H	M	H	M	H
CO3	H	M	H	M	H	M	H	H	M	H	M	H
CO4	M	H	L	H	M	H	L	M	H	L	H	M
CO5	H	L	H	M	H	H	H	H	H	H	H	M

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Write a java program to illustrate the concept of Package creation. 2. Write a java program to illustrate the concept of threading. 3. Write a java program to illustrate the concept of synchronization. 4. Write a java program to illustrate the concept of Exception Handling Mechanism. 5. Write a java program to develop an Applet. 6. Write a java program to implement to the concept of decision making statements. 7. Write a java applet program to illustrate the concept of multithreading. 8. Write a java program using file concept. 9. Write a java program to illustrate the concept of control statements 10. Write a java program to illustrate the concept of Useful I/O Classes	**60**
Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT311			**Title**	**Batch:**	2021 – 2024
				LAB-IV- DATABASE MANAGEMENT SYSTEM LAB	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	04	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To enable the students to know about database concepts with practical Knowledge

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basic commands such as DDL, DML, TCL	K3
CO2	Understand about various set, join operations and group functions in PL/SQL	K4
CO3	Develop various set and join operation in SQL	K4
CO4	Use PL/SQL stored procedure, stored functions, cursors and packages to query the database.	K4
CO5	Validate the PL/SQL cursors, GROUPBY clauses	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	H	H	M	H	M	H	H	M	H
CO3	H	M	H	H	H	M	H	M	H	L	M	H
CO4	M	H	L	M	M	H	L	H	M	M	H	M
CO5	H	L	H	H	H	L	H	M	H	H	M	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs **Sample Programs** 1. Write a query for DDL and DML commands. 2. Write a query for TCL commands. 3. Write a query for NOT NULL, CHECK, UNIQUE constraints. 4. Write a query to implement functions in SQL. 5. Write a query for JOIN operations. 6. Write a query to implement set operator 7. Write a SQL program for user-defined exception 8. Write a SQL block to delete and update using trigger. 9. Write a query for the HAVING clause. 10. Write a query for GROUP BY clause	**60**
Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K.S.Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT3N1			**Title**	**Batch:**	2021 – 2024
				Skill Based NON-MAJOR ELECTIVE I - HTML LAB	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	01	**Tutorial Hrs./Sem.**	04		**Credits:**	02

Course Objective

To understand the principles of creating an effective web page using HTML.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind the concept of Basic HTML tags	K3
CO2	Understand about ordered list and unordered list, creation of table, creations of forms	K4
CO3	Validate the creation of a simple webpage using basic HTML	K4
CO4	Use scripting Techniques for dynamic effects and to validate form input entry	K3
CO5	Analyze to Use appropriate client-side or Server-side applications	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Create a HTML document using basic HTML tags. 2. Create a HTML program with text formatting tags. 3. Create a HTML program to set the background color. 4. Create a link by using HTML tags. 5. Create a HTML program to insert an image in a document. 6. Create a HTML program to create a table. 7. Create a HTML program to implement ordered list with numbers. 8. Create a HTML program to implement ordered list with alphabets. 9. Create a HTML program to implement unordered list. 10. Create a Form with input box and submit button.	**15**
Total Contact Hrs	**15**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT3N2			**Title**	**Batch:**	2021 – 2024
				Skill Based NON-MAJOR ELECTIVE I - MULTIMEDIA LAB	**Semester:**	III
Lecture Hrs./Week or Practical Hrs./Week	01	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To offer the knowledge of creating and working with digital images and to manipulate them and to develop a presentation package using multimedia tools

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind the concept of Basic Multimedia Techniques	K3
CO2	Discuss the application of multimedia concepts in the development of information visualization and business applications.	K4
CO3	Validate the creation of a simple applications using multimedia tools	K4
CO4	Use scripting Techniques for dynamic effects and to validate form input entry	K3
CO5	Comprehend and analyse the fundamentals of animation, virtual reality, underlying technologies, principles and applications.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Cropping images using Lasso Tool 2. Designing Pictures using Paint Tools 3. Designing Text using Text Tools 4. Applying Layer Effects to Images and Texts 5. Designing an Employee or Student ID card 6. Designing a seasonal greetings 7. Design a photograph applying Filter effects 8. Design an invitation for a conference 9. Design a brochure or poster for a technical symposium 10. Designing a Flexible banner for your college	**15**
Total Contact Hrs	**15**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

SEMESTER- IV

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT412			**Title**	**Batch:**	2021 – 2024
				CORE VIII: ADVANCED JAVA PROGRAMMING	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	04		**Credits:**	04

Course Objective

To inculcate the students to understand the advanced JAVA concepts and develop Java based applications by applying these advanced concepts to implement in web based applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Create Applications using Swing Components.	K4
CO2	Understand about Servlets and Server Side Includes	K2
CO3	Implement JDBC connectivity and Java Server Pages	K3
CO4	Review the various types of beans	K4
CO5	Understand and apply Well-Formed XML and different types of XML Schemas	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	H	M
CO3	H	M	H	M	H	H	M	H	M	H	L	M
CO4	M	H	L	H	M	M	H	L	H	M	M	H
CO5	H	L	H	M	H	H	L	H	M	H	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Tour of Swing: JApplet- Icons and Labels – JText Fields – JButtons – JCombo Boxes - JTabbed Panes – JScroll Panes – JTrees – JTables– Exploring Swing.	15
Unit II	Servlet Overview and Architecture, Movement to Server-Side Java – Java Servlet - Practical applications for Java Servlets – Java Servlet Alternatives – Reasons to Use Java Servlets – Java Servlet Architecture. Servlet Basics – The Life Cycle of a Servlet – A Basic Servlet – Basic Servlet Source – Building and Installing the Basic Servlet – The HTML Required to Invoke the Servlet – Dissecting the Basic Servlet.	15
Unit III	JSP –Conditions – Directives – Declarations- Implicit Variables – Scriptlets – Expressions. Servlet Sessions: Session Tracking – Working with Cookies.	15
Unit IV	Enterprise Java Bean: Introduction – Enterprise Java Bean Technology - Types of Bean - Examples of EJB. Server-Side includes - Servlet chaining: Uses for Servlet chain - Invoking a Servlet Chain– A practical Example using Servlet Chaining.	15
Unit V	Servlets and JDBC– Two and Three-tier Database Access Models – JDBC Driver Types – JDBC Basics – A Basic JDBC Servlet – JDBC RMI.	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Herbert Schildt	JAVA 2: The Complete Reference	5th Edition, Tata-McGraw Hill, ISBN-13: 9780070495432	2017
2	James Goodwill	Developing Java Servlets	2nd Edition, Tech media, ISBN-13 : 978-0672321078	2014
3	Rima Patel Sriganesh, Gerald Brose, Micah Silverman.	Mastering Enterprise Java Beans 3.0	Wiley India Edition, Wiley India Pvt. Ltd, ISBN-13 : 978-0471785415 .	2011

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	SubrahmanyamAllara maju,Cedric Buest , Marc Wilcox, Sameer Tyagi	Professional Java Server Programming J2EE	1.3 Edition, WROX Press Ltd, ISBN-13: 9781861005373	2001
2	Jayson Falkner and Kevin Jones.	The J2EE Technology Web Tier	1stEdition,Addison-Wesley Professional ISBN: 0321136497.	2004

Web References

1. https://www.tutorialspoint.com/javascript
2. https://www.w3schools.com/
3. https://www.swayaminfotech.com/blog/tag/j2ee/
4. https://onlinecourses.nptel.ac.in/noc19_cs84/preview
5. https://www.tutorialspoint.com/listtutorial/Web-Application-J2EE-perspective/3142

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT413			**Title**	**Batch:**	2021 – 2024
				CORE IX: LINUX AND SHELL PROGRAMMING	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	4		**Credits:**	04

Course Objective

This course introduces basic understanding of Linux OS, Linux commands and File system and to Familiarize students with the Linux environment.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the operating system architecture and low level interfaces that are required to build Linux systems	K1
CO2	Understand different commands used by system administrator and file related commands	K2
CO3	Apply various Linux operating system commands and utilities in Linux systems	K3
CO4	Evaluate the shell scripts with different programming goals	K4
CO5	Analyze different types of shell associated commands	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	M	H	H	M	H
CO3	H	M	H	M	H	M	H	M	H	H	M	H
CO4	M	H	L	H	M	H	L	H	M	M	H	L
CO5	H	L	H	M	H	L	H	M	H	H	L	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction:** Hardware Requirements for Linux – Salient Features – Multiuser Capability, Multitasking Capability, Communication, Security, Portability –Linux System Organization – Types of Shells – Bourne Shell, C shell, Korn Shell - Unix Commands. **Unix File System:** Creating Files – Indulging in File Play – Listing Files and Directories – Masking File Permissions – Directory Permissions – Removing File Forcibly – Directory Related Commands – Miscellaneous Commands.	15
Unit II	**File System:**The Boot Block, The Super Block, The Inode Table, Data Blocks – Storage of Files – Disk Related Commands – Disk Usage. **Essential Linux Commands:** Password - cal command – banner command –touch command – file command – Links with DOS – File Related Commands –wc, sort, cut, grep, dd – Viewing Files – File Compression.	15
Unit III	**VI Editor:** Modes of Operations – Learning the Ropes – Adding Text, Delete Text, Overwriting Text, Quitting vi – Block Commands – Search Strings – Find and Replace, Delete and Paste, Yank and Paste – Set Command – Customizing vi Environment – Multiple File Editing in vi. **Processes in Linux:**ps command – Background Process – The nohupCommand Killing a Process – Changing Process Priorities – Scheduling of Processes –'at' command – 'batch' command – 'crontab' command. **Communication**: 'Write' command – ''wall' command –'mail' Command	15
Unit IV	**Programming with Shell:** Introduction to shell script-creation and execution-system variables-profile-read statement-command line arguments-logical operators && and ||-exit-if conditional-case-while statement-for set-shift-trap statement-shell variables-cd command-merging stream-expr command-eval command-shell programs.	15
Unit V	**System Administration:** System Administrator-Booting and shutting down-super user status (su) - security-user services - disk management (fsck) - operation -file system administration-backups utilities - cpio- afio- shutdown – mount –unmount – df - find commands-creating device files-installing and managing printers.	15
	Total Contact Hrs	**75**

21UCT413

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	YashavantKanetkar	UNIX Shell Programming (Unit I – III)	BPB Publications, 3rd Edition	2016
2	Sumitabha das	UNIX System Concepts and Applications(Unit IV,V)	Tata McGraw - Hill, Fourth edition	2014

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Mark.G.Gobell	Red Hat LINUX-Reference Manual	Pearson education	2014

Web References

1. https://www.tutorialspoint.com/unix
2. https://lecturenotes.in/subject/455/linux-programming-lp
3. https://linuxconfig.org/linux-command-line-tutorial
4. https://www.guru99.com/unix-linux-tutorial.html
5. https://onlinecourses.swayam2.ac.in/aic20_sp26/preview

21UCT413

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT414			**Title**	**Batch:**	2021 – 2024
				CORE X: DATA COMMUNICATION AND NETWORKS	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	03		**Credits:**	04

Course Objective

1. To identify various components in a data communication system and understand state-of- the-art in network protocols, architectures and applications.
2. To enable students through the concepts of computer networks, different models and their involvement in each stage of network communication.
3. To educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.	K1
CO2	Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security.	K2
CO3	Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.	K3
CO4	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies	K4
CO5	Knowledge about different computer networks, reference models and the functions of each layer in the models	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	H	M
CO3	H	M	H	M	H	H	M	H	M	H	L	M
CO4	M	H	L	H	M	M	H	L	H	M	M	H
CO5	H	L	H	M	H	H	L	H	M	H	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to Data Communications and Networking:** Data Communications- Protocols - Analog and Digital Signals. Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing.	15
Unit II	**Transmission Errors:** Detection and Correction. **Transmission Media**: Guided Media, Unguided Media. **Network Topologies**: Mesh, Star, Tree, Ring, Bus. Switching Basics- Circuit switching - Packet switching - Message switching - Router and Routing.	15
Unit III	**Network Protocols and OSI Model:** OSI layer Functions. Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) –Frame Relay.	15
Unit IV	**Internetworking Concepts, Devices, Internet Basics, History and Architecture:** Internetworking Devices, Repeaters, Bridges, Routers and Gateways. **An Introduction to TCP / IP, IP:** TCP/IP Basics, TCP/IP Example, The concept of IP Address– IPV6.	15
Unit V	**TCP/IP Part II:** User Datagram Protocol (UDP) - UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – Introduction – E-Mail Transfer protocols – MIME – E-Mail Privacy – Spam in E-Mail and Phishing.	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Achyut S.Godbole	Data Communications and Networks	2nd ed. Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0-07-047297.	2017

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Behrouz A. Forouzan	Data Communications and Networking	4th Edition, Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0070634145.	2017
2	Andrew S. Tanenbaum	Computer Networks	5th Edition, Prentice Hall, ISBN-13: 978-9332518742	2013

Web References

1. https://onlinecourses.swayam2.ac.in/cec19_cs07/preview
2. https://www.tutorialspoint.com/data_communication_computer_network/index.htm
3. http://www.engppt.com/2009/12/networking-fourozan-ppt-slides.html
4. https://www.slideshare.net/SalihinNirbhoy/basic-computer-networking-tutorial
5. https://www.slideshare.net/HarpreetDhaliwal/presentation-on-data-communication

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT4A4			**Title**	**Batch:**	2021 – 2024
				ALLIED IV: BIG DATA MANAGEMENT	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	03		**Credits:**	04

Course Objective

1. The students will possess the skills necessary for utilizing tools (including deploying them on Hadoop/ Map Reduce to handle a variety of big data analytics.
2. The students will be able to apply the analytics techniques on a variety of applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind Evolution of Data Management, Architecture, Structured and Unstructured Data.	K1
CO2	Comprehend deep knowledge about the Distributed Computing, Digging into Big Data Technology Components, Big Data Applications.	K2
CO3	Apply techniques of Virtualization, Distributed Computing, Databases, and Columnar Databases in various applications.	K3
CO4	Analyze the concepts of Tracing the Origins of Map Reduce, Adding the reduce Function, Analysis andExtraction Techniques.	K4
CO5	Evaluate the need and fundamentals of HBase. Apply the Cassandra data model for different applications.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Grasping the Fundamentals of Big Data :**The Evolution of Data Management - Understanding the waves of Managing Data -Defining Big Data -Building a Successful Big Data Management Architecture **Examining Big Data Types:** Defining Structured Data- Defining Unstructured Data- Putting Big Data Together.	15
Unit II	**Old Meets New- Distributed Computing:** A Brief History of Distributed Computing- Understanding the Basics of Distributed Computing- **Digging into Big Data Technology Components:** Exploring the Big Data Stack- Layer 0: Redundant Physical Infrastructure- Layer 1:Security Infrastructure - Layer 2: Operational Databases- Layer 3: Organizing Data Services and Tools - Layer 4: Analytical Data Warehouses -Big Data Analytics -Big Data Applications.	15
Unit III	**Virtualization and How It Supports Distributed Computing:** Understanding the Basics of Virtualization- Importance of virtualization of Big Data. Big Data management: Document Databases: MongoDB –CouchDB .**Columnar Databases** : Hbase columnar database.	15
Unit IV	**Map Reduce Fundamentals:** Tracing the Origins of Map Reduce -Understanding the map Function- Adding the reduce Function -Putting map and reduce Together.	15
Unit V	**Understanding Text Analytics and Big Data:** Exploring Unstructured Data- Understanding Text Analytics- Analysis and Extraction Techniques – Characteristics of Big data analysis - Characteristics of Big data analysis framework.	15
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman.	Big Data for Dummies	John Wiley & Sons, Inc.	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Bill Franks	Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with advanced analytics	John Wiley & sons.	2012
2	DT Editorial Services	Big Data Black Book	1st edition, Dreamtech Press. ISBN – 13: 9789351197577.	2015
3	Seema Acharya, SubhashiniChellappan,	Big Data and Analytics	1st edition, Wiley Publication.	2016
4	O'Reilly Media	"Big Data now: Current Perspective"	O'Reilly Media	2013

Web References

1. https://www.edureka.co/blog/big-data-tutorial
2. http://statweb.stanford.edu/~tibs/ElemStatLearn/
3. https://www.coursera.org/learn/big-data-introduction
4. https://nptel.ac.in/courses/106/104/106104189/
5. http://statweb.stanford.edu/~tibs/ElemStatLearn/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT415			**Title**	**Batch:**	2021 – 2024
				LAB - V: ADVANCED JAVA PROGRAMMING LAB	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	04	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To build GUI applications and connect to JDBC, create Web applications using server side programming languages – Servlets, JSP and Java beans**.**

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recollect the concept of Swing Components and cookies	K3
CO2	Understand and integrate Servlets, JDBC and JSP to develop web applications	K4
CO3	Validate the idea of Java Beans to build enterprise applications	K3
CO4	Develop an request object method using enterprise applications	K4
CO5	Illustrate the concept of Server-side Includes and Servlet chaining	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Content	Hrs.
List of Programs 1. Create a program to illustrate the concept of Introspection. 2. Create a bean program to design a simple property of the bean. 3. Create a java program to illustrate the concept of Generic Servlet. 4. Create a java program to illustrate the concept of Http Servlet. 5. Create a java program to illustrate the concept of Servlet chaining. 6. Create a java program to illustrate the concept of Server-side Includes. 7. Create a java program to illustrate the concept of Request Object Method. 8. Create a java program to illustrate the concept of JDBC Connectivity. 9. Create a jsp program to illustrate the concept of Implicit Objects. 10. Create a program to illustrate the concept of Sessions in JSP.	60
Total Contact Hrs.	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT416			**Title**	**Batch:**	2021 – 2024
				LABVI: LINUX AND SHELL PROGRAMMINGLAB	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	04	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To enable the students to write program in Linux for solving specified problems.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Apply the various Linux distributions.	K3
CO2	Evaluate the basic set of commands and utilities in Linux systems.	K4
CO3	Validate various shell scripts with different programming concepts.	K3
CO4	Apply and change the ownership and file permissions using advance Unix commands.	K4
CO5	Create shell scripts for real time applications.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	M	H	M	H	M
CO3	H	M	H	M	H	M	H	M	H	M	H	M
CO4	M	H	L	H	M	H	L	H	M	H	L	H
CO5	H	L	H	M	H	L	H	M	H	L	H	M

*H-High; M-Medium; L-Low

Content	Hrs.
List of Programs 1. Write a shell script to stimulate the file commands: rm, cp, cat, mv, cmp, wc, split 2. Write a Shell Script to implement the following: pipes, Redirection and commands. 3. Write a shell script for displaying current date, user name, file listing and directories by getting user choice. 4. Write a shell script to implement the filter commands. 5. Write a shell script to remove the files which has file size as zero bytes. 6. Write a shell script to find the sum of the individual digits of a given number. 7. Write a shell script to implement command line arguments. 8. Write a shell script for executing control statements 9. Write a shell script to print the multiplication table of the given argument using for loop. 10. Write a shell script to show the following system configuration : a. currently logged user and his log name b. current shell , home directory , Operating System type , current Path setting c. show currently logged number of users, show all available shells d. show CPU information like processor type , speed e. show memory information	60
Total Contact Hrs.	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT4N1			**Title**	**Batch:**	2021 – 2024
				Skill Based NON-MAJOR ELECTIVE II – OFFICE AUTOMATION LAB	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	01	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To familiarize the students in preparation of documents and presentations with office automation tools

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind about the menus and icons functionalities in MS Word	K3
CO2	Understand and apply mathematical functions to calculate mean, median and standard deviation using Excel	K3
CO3	Apply different build in functions and their usage.	K4
CO4	Prepare a power point presentation for a range of events	K4
CO5	Include graphs, tables and images to power point presentation	K3

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Content	Hrs.
MS WORD 1. Type the text, check spelling and grammar, bullets and numbering list items, align the text to left, right, justify and centre. 2. Prepare a job application letter enclosing your bio-data. 3. Performing mail merge operation and preparing labels. 4. Preparing a neatly aligned, error free document, add header and footer, also perform find and replace operation. 5. Prepare a document in newspaper column layout. **MS EXCEL** 6. Worksheet Using formulas. 7. Worksheet Manipulation for electricity bill preparation. 8. Drawing graphs to illustrate class performance. 9. An excel worksheet contains monthly Sales Details of five companies. **MS POWER POINT** 10. Prepare a power point presentation for Department inaugural function.	15
Total Contact Hrs.	**15**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT4N2			**Title**	**Batch:**	2021 – 2024
				Skill Based NON-MAJOR ELECTIVE II - CORELDRAW LAB	**Semester:**	IV
Lecture Hrs./Week or Practical Hrs./Week	01	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To equip the students with the basic knowledge of CorelDraw graphics suites

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Keep in mind about CorelDraw workspace, tools and panels	K3
CO2	Comprehend a variety of images using crop tools, zooming, curve and smart fill tools	K4
CO3	Validate the animation works using CorelDraw	K3
CO4	Develop different animations with help of Corel tools	K4
CO5	Create variety of techniques for designing methods	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Content	Hrs.
1. Create a program using drawing tools. 2. Create a program to work with layers 3. Develope a program for Text tools 4. Create a program to work with frames 5. Create a model using Freehand Tool 6. Create a program for masking a picture 7. Create a program using bitmap files 8. Create a program to develop a layers 9. Create a program for transformation of an object 10. Develope a program for animation effects	15
Total Contact Hrs.	15

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

SEMESTER- V

Programme Code:	B.Sc. UCT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT517			**Title**	**Batch:**	2021 - 2024
				CORE XI: OPEN SOURCE TECHNOLOGIES	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	6	**Tutorial Hrs./Sem.**	2		**Credits:**	05

Course Objective

To impart basic knowledge of PHP and MySQL and development of web applications using open source web technologies like Apache, MySQL and PHP (LAMP/XAMP).

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Obtaining the basic concepts of PHP	K1
CO2	Gain the basic knowledge on Decision making and Looping	K1, K2
CO3	Understand the concept in string manipulation and arrays	K1, K3
CO4	Gain detailed knowledge on MySQL Commands	K4
CO5	Obtain knowledge about database manipulation using MySQL and design dynamic web pages.	K5, K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	H	H	H	M	H	H	M	H
CO2	H	H	M	H	H	L	H	H	H	H	H	H
CO3	H	M	H	H	H	H	L	H	H	H	H	M
CO4	H	H	H	M	H	L	H	M	H	M	M	H
CO5	H	M	H	H	H	H	H	H	H	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introducing PHP:** History – Unique features – Basic Development Concepts – Creating your First PHP Script – Sample Applications. **Using Variables and Operators:** Storing Data in Variables – Understanding PHP's Data types – Setting and Checking Variable Data Types – Using Constants – Manipulating Variables with Operators – Handling Form Input.	18
Unit II	**Controlling Program Flow:** Writing Simple Conditional Statements – Writing More Complex Conditional Statements – Repeating Actions with Loops – Working with String and Numeric Functions. **Working with Arrays:** Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms – Working with Array Functions – Working with Dates and Times.	18
Unit III	**Using Functions and Classes:** Creating User-Defined Functions – Creating Classes – Using Advanced OOP Concepts. **Working with Files and Directories:** Reading Files – Writing Files – Processing Directories – Performing Other File and Directory Operations.	18
Unit IV	**Working with Databases and SQL:** Introducing Databases and SQL – Creating and Populating a Database – Using PHP's MySQLi Extension – Adding or Modifying Data – Handling Errors. Using PHP's SQLite Extension – Using PHP's PDO Extension – Using a MySQL Database – Switching to a different Database.	18
Unit V	**Python Basics:** Introduction – Installation – Data types and Data structures –Control flow – Functions – Modules – Packages – File handling – Date/Time – Operations – Classes.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	VikramVaswani	PHP: A Beginner's Guide	Tata McGraw Hill Publications , Second Reprint	2012

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Alan Forbes	The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL	Kindle Edition	2020
2	RasmusLerdorf, Kevin Tatroe	Programming PHP	O'Reilly Media , 3rd Edition	2013
3	Luke Welling; Laura Thomson	PHP and MySQL-Web Development	4th Edition	2013
4	Robin Nixon	Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition	O'reilly Media	2014

Web References

1. https://www.tutorialspoint.com/php/
2. https://www.siteground.com/tutorials/php-mysql/
3. https://onlinecourses.swayam2.ac.in/aic20_sp32/preview
4. https://www.geeksforgeeks.org/php-mysql-database-introduction/
5. https://www.w3schools.com/php/php_mysql_intro.asp

21UCT517

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT518			**Title**	**Batch:**	2021 - 2024
				CORE XII: INFORMATION SECURITY	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	2		**Credits:**	05

Course Objective

To understand the essentials of information security and learn the algorithms for implementing security.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember and understand the fundamentals of security algorithm in various layers.	K1, K2
CO2	Analyze the various symmetric key and public key algorithms	K4
CO3	Understand the techniques to secure data in Hash algorithms.	K2
CO4	Assess cyber security risk management policies in order to adequately protect critical information and assets.	K3
CO5	Analyze the various attacks in networks and discover how to protect personal data, securing simple computer networks, and safe Internet usage.	K4

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	M	H
CO2	H	H	H	M	H	H	L	M	H	H	M	H
CO3	H	H	L	H	H	M	H	H	H	H	H	H
CO4	H	H	M	L	H	H	L	H	H	M	H	M
CO5	H	H	H	H	H	H	H	H	H	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Attacks on Computers and Computer Security**: Introduction – Need For Security – Types Of Attacks. **Cryptography - Concepts and Techniques:** Introduction – Plain Text and Cipher Text – Substitution Techniques - Transposition Techniques – Encryption and Decryption.	18
Unit II	**Symmetric Key Algorithms**: Introduction – Algorithm Types – An Overview Of Symmetric Key Cryptography – **Data Encryption Standard (DES)**: How DES Works? **Asymmetric Key Algorithms, Digital Signature and RSA**: Introduction – An Overview Of Asymmetric Cryptography - The RSA Algorithm.	18
Unit III	**Digital Certificate and Public Key Infrastructure (PKI)**: Digital Certificates: Introduction – The Concept of Digital Certificate – Certificate Authority – Technical Details. The PKIX Model. **Internet Security Protocols:** Introduction –Secure Socket Layer – (SSL) – Secure Hyper Text Transfer Protocol (SHTTP).	18
Unit IV	**Email Security: PGP –** How PGP Works? - **S / MIME: Introduction –** Cryptographic Algorithms used in S/MIME – Security in GSM –Security in 3G.**User Authentication And Kerberos:** Introduction – Authentication Basics – **Passwords:** Introduction – Clear Text Passwords - Kerberos.	18
Unit V	**Cryptography in JAVA**: Introduction – Cryptographic Solution Using JAVA. **Network Security Firewalls and Virtual Private Networks** (VPN): Introduction – **Fire Walls**: Introduction – Types of Firewalls. Virtual Private Networks (VPN) – Intrusion.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Atul Kahate	Cryptography and Network Security	McGraw Hill Education, 3 rd Edition	2012

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Mark Rhodes-Ousley, Roberta Bragg, Keith Strassberg	Network Security: The Complete Reference	Tata McGraw-Hill , 1st Edition	2017
2	William Stallings	Cryptography and Network Security Principles and Practices	5th Edition,	2011
3	Brijendrasingh	Network Security and Management	PHI Publication , 3rd Edition	2011
4	Dr.Michael E. Whitman, Herbert J. Mattord	Principles and Practices of Information Security	Course Technology Cengage Learning, 4 th edition	2012

Web References

1. https://onlinecourses.swayam2.ac.in/nou21_cs01/preview
2. https://www.tutorialspoint.com/cryptography/index.htm
3. https://www.guru99.com/how-to-make-your-data-safe-using-cryptography.html
4. https://www.gatevidyalay.com/tag/cryptography-and-network-security-tutorial/
5. https://www.javatpoint.com/cyber-security-tutorial

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. C.T.			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	20UCT5E1			**Title**	**Batch:**	2021 - 2024
				Core Elective - I : CLOUD COMPUTING	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	2		**Credits:**	05

Course Objective

To impart the Basic Concepts of Cloud Computing and understand the Technologies and Architectures of Cloud Computing.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Tell about the fundamentals of cloud computing.	K1
CO2	Describe the scaling techniques in computer system and managing the cloud data.	K2
CO3	Discuss about tracing and exploring cloud services.	K2
CO4	Examine about cloud managing and security.	K3
CO5	Illustrate about managing desktops and devices in the cloud.	K3

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	M	H	H	H	M	H	M
CO2	H	M	L	H	H	H	H	L	M	H	H	H
CO3	H	H	M	H	L	H	M	H	H	L	H	M
CO4	H	H	H	H	H	H	H	H	H	M	H	H
CO5	H	H	M	H	H	M	H	L	H	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to Cloud Computing:** Characteristics – Models – Services Examples – Services and Applications. **Cloud concepts and Technologies:** Virtualization – Load balancing – scalability and elasticity – Deployment – Replication – Monitoring – Software defined Networking – Network function virtualization – MapReduce – Identity and access management - Service level agreements – Billing.	18
Unit II	**Cloud services and Platforms:** Compute – Storage – Database – Application – Content Delivery – analytics – Deployment and Management – Identity and access Management – Open source Private Cloud Software. **Hadoop and MapReduce:** Apache Hadoop – MapReduce Job execution – Schedulers – Cluster setup.	18
Unit III	**Cloud Application Design:** Introduction **–** Design considerations – Reference Architectures – Design methodologies – Data storage approaches. **Cloud Application Benchmarking and Tuning**: Introduction – Workload Characteristics – Application Performance Metrics – Design Considerations – Benchmarking Tools – Deployment prototyping – Load Testing and Bottleneck Deduction – Hadoop Benchmarking.	18
Unit IV	**Cloud Security:** Introduction – CSA Cloud Security Architecture – Authentication – Authorization – Identity and Access Management – Data Security – Key Management – Auditing. **Cloud For Industry, Health Care and Education:** Health Care – Energy systems – Transportation systems – Manufacturing Industry – Education.	18
Unit V	**Python for Cloud:** Amazon web services – Google Platform – Windows Azure – MapReduce – Packages – Web Application Framework – Designing a RESTful Web API	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	ArshdeepBahga, Vijay Madisetti.	Cloud Computing – A Hands-on Approach.	Universities Press Pvt. Ltd.	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Thomas Erl, ZaighamMahmood&Richardoputtini	Cloud Computing (Concepts, Technology & Architecture)	Prentice Hall Press.	2013
2	Judith Hurwitz,Robin Bloor Marcia Kaufman and Dr. Fernhalper	Cloud Computing For Dummies	Willey India Publication Edition	2010
3	Prasant Kumar Pattnaik	Fundamentals of Cloud Computing	Vikas Publishing House	2014
4	RajkimarBuyya.,et.al	Cloud Computing: Principles and Paradigms	Wiley publications	2013
5	Michael Miller	Cloud Computing: Web-Based Applications That Change the way you work and Collaborate Online	Macmillan Computer Publication,1st Edition	2008

Web References

1. https://www.motc.gov.qa/sites/default/files/cloud_computing_ebook.pdf
2. https://onlinecourses.nptel.ac.in/noc21_cs62/preview
3. https://data-flair.training/blogs/cloud-computing-tutorial/
4. https://www.javatpoint.com/cloud-computing-tutorial
5. https://www.guru99.com/cloud-computing-for-beginners.html

20UCT5E1

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT5E2			**Title**	**Batch:**	2021 - 2024
				Core Elective - I : EMBEDDED SYSTEMS	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	2		**Credits:**	05

Course Objective

To emphasizes on comprehensive treatment of embedded hardware and real time operating systems along with case studies, in tune with the requirements of Industry.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics concepts in embedded systems	K1, K2
CO2	Understand the knowledge on hardware & software components and developing tools in embedded systems.	K2
CO3	Understand the working of ARM processor and learn to write programs in ARM processor	K2
CO4	Understand the basic concepts of real time operating systems using the concepts of RTOS.	K2
CO5	Develop embedded applications	K3, K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	H	H	H	H	H	H	H	H
CO2	H	H	L	H	L	H	H	M	H	L	M	H
CO3	H	M	H	H	H	M	H	H	H	H	H	H
CO4	H	H	H	L	H	H	L	H	M	H	H	H
CO5	H	H	H	H	H	H	H	H	H	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to Embedded System**: Embedded System – Processor Embedded into the System – Embedded Hardware units and Devices in a System – Embedded Software in a system – Examples of embedded system – Embedded system on chip and use of VLSI circuit - Classification of embedded systems – Skills required for an embedded System Designer.	18
Unit II	**Devices and buses for device networks**: I/O Types and Examples – Serial Communication devices: Synchronous, Iso-Synchronous and Asynchronous communication from serial devices – Parallel Device Ports - Timer and counting devices – Watchdog timer – Real time clock – Network Embedded Systems – Serial Bus Communication Protocol.	18
Unit III	**Device drivers and Interrupts servicing mechanism**: ISR concept - Device drivers – Interrupt servicing mechanism – Context and the periods for context-switching, dead-line and interrupt latency – Device Driver Programming: Writing physical device-driving ISRs in a system- Parallel port device drivers.	18
Unit IV	**Programming concepts and embedded programming in C and C++**: Embedded programming in C++ and in Java. **Program modeling concepts in single and multi processor systems**: Program Models – DFG Models – State Machine Programming Models for Event-controlled Program Flow – Modeling of Multiprocessor Systems.	18
Unit V	**Inter – process communication and synchronization of processes, Threads and Tasks:** Multiple processes in an application – Multiple Threads in an application – Tasks- Task States- **Real time operating systems**: Operating system services – Real time operating systems – Basic Design using RTOS: Principles – RTOS Task scheduling Models, Interrupt Latency and Response of the Tasks as Performance Metrics: Cooperative Scheduling model-Cyclic and Round Robin Scheduling models – Preemptive Scheduling model.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Raj Kamal	Embedded Systems – Architecture, Programming and Design	McGraw Hill, 2nd Edition	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Shibu K V	Introduction to Embedded Systems	McGraw Hill Education, 2nd Edition	2017
2	Lyla B Das	Embedded Systems-An Integrated Approach	Pearson Edition	2013
3	Elicia White	Making Embedded Systems	O' Reilly Series, SPD	2011
4	Daniel W. Lewis	Fundamentals of Embedded Software	PHI Education Publications, 1stEdition	2007

Web References

1. https://onlinecourses.nptel.ac.in/noc21_cs09/preview
2. https://profile.iiita.ac.in/bibhas.ghoshal/IEMB_2018/Lectures/ES_basics.pdf
3. https://www.tutorialspoint.com/embedded_systems/index.htm
4. https://www.javatpoint.com/embedded-system-tutorial
5. https://www.bharathuniv.ac.in/colleges1/downloads/courseware_eee/Notes/NE1/BEE%20049-%20design%20of%20embedded%20system.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			Programme Title:	Bachelor of Computer Technology	
Course Code:	21UCT5E3			Title	Batch:	2021 - 2024
				Core Elective - I : MANAGEMENT INFORMATION SYSTEM	Semester:	V
Lecture Hrs./Week or Practical Hrs./Week	6	Tutorial Hrs./Sem.	2		Credits:	05

Course Objective

To inculcate knowledge to students why information systems are so important today for business and as well as educate the role of the major types of information systems in a business environment.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Tell about the basic concepts and Roles of Management Information Systems	K1
CO2	Describe the development of Business strategies, E-Business Models.	K2
CO3	Discuss about the Decision Making concepts and Knowledge Management in MIS	K2
CO4	Examine the applications in Manufacturing Sector and Service sector in Industry.	K3
CO5	Illustrate the Enterprise Management System and Information Systems processing.	K3

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	M	H	H	H	H	H	H	H	H
CO2	H	H	L	L	H	H	H	M	H	M	L	H
CO3	H	M	H	H	H	H	M	H	H	H	H	H
CO4	H	H	M	M	H	H	M	H	H	L	H	H
CO5	H	H	H	H	L	H	H	H	M	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to MIS:** MIS concept – Definition – Role of MIS – Impact of MIS – MIS and the User – Management as a Control system – MIS: a support to Management – Management Effectiveness and MIS – Organization as a system. **Organizational Behaviour Process Management**: Planning – Organizing – Staffing – Coordinating – Directing and – Controlling.	18
Unit II	**Strategic Management of Business Performance:** Essentiality of Strategic Planning – Tools of Planning – Strategic Management of Business Performance – What is Strategy? – Class and Types of Strategies. **Electronic Business Technology:** Introduction to E-Business – Models of E-Business- Electronic Payment System – Security in E-Business – MIS and E-Business. **A tool for business management:** Internet and Web Process Management – strategic Management under Web – Web Enabled Business Management – Application system Architecture in Web – MIS in Web Environment.	18
Unit III	**Decision Making:** Decision-making concepts – Decision-making process– Behavioural Concepts in Decision-making – Organizational Decision-making – MIS and Decision-making – Decision Methods Tools and Procedures. **Information and Knowledge**: Information Concepts – Information: a quality product – Classification of Information – Methods of data and Information Collection – Value of Information – General Model of a Human as an Information Processor. **Choice of Information Technology:** Nature of IT decision – Strategic Decision – Configuration Design – Evaluation.	18
Unit IV	**Applications in Manufacturing Sector:** Personnel, Financial, Production, Raw Material and Marketing Managements. **Applications in Service Sector:** Introduction to Service Sector – Creating a Distinctive Service MIS Application in Service Industry – **MIS:** Service Industry.	18
Unit V	**Management of Global Enterprise**: Enterprise Management Systems – ERP system – ERP Model and Modules –Benefits of ERP –ERP Product Evolution - ERP Implementation – EMS and MIS. **Technology of Information Systems**: Introduction – Data Processing – Transaction Processing – Application Processing – Information System processing – Human Factors and User Interface -Real Time Systems and Good Design.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Waman S Jawadekar	Management Information Systems Text and cases	Tata McGraw Hill Publications , 5 th Edition	2013

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUB LICATION
1	James A O'Brien & George M Marakas	Management Information Systems	Tata McGraw Hill, 10th Edition	2014
2	Kenneth C Laudon& Jane p.Laudon	Management Information Systems managing the digital firm	PHI 12th Edition,	2011
3	MahadeoJaiswal& Monika Mital	Management Information Systems	Oxford University Press 4th Edition	2004

Web References

1. https://ebooks.lpude.in/management/mba/term_4/DMGT505_MANAGEMENT_INFORMATION_SYSTEM.pdf
2. https://onlinecourses.nptel.ac.in/noc21_mg89/preview
3. http://www.himpub.com/documents/Chapter963.pdf
4. https://www.guru99.com/mis-tutorial.html
5. https://repository.dinus.ac.id/docs/ajar/Kenneth_C.Laudon,Jane_P_.Laudon__Management_Information_Sysrem_13th_Edition_.pdf

21 UCT 5E3

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT519			**Title**	**Batch:**	2021 - 2024
				LAB – VII - OPEN SOURCE TECHNOLOGIES	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	0		**Credits:**	02

Course Objective

To expose students to free open source software environment and introduce them to use open source packages.

To work with open source applications that deal with database and website development.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Write PHP scripts using operators to perform various functions	K6
CO2	Implement different types of PHP functions and the concepts of files and directories	K3
CO3	Write regular expressions including modifiers, operators, and meta characters	K6
CO4	Create PHP scripts using array	K6
CO5	Evaluate the database connectivity using PHP and SQLite and Develop dynamic web pages.	K5, K3

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	M	H	M	H	H	H	H	H	H	H	H
CO2	H	H	M	H	L	H	H	M	L	M	H	H
CO3	H	M	H	M	H	M	H	H	H	L	M	H
CO4	H	H	M	H	L	H	M	L	M	H	H	M
CO5	H	H	M	H	H	H	M	H	H	H	H	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Develop a PHP Script using the concept of Control Structure &Loops. 2. Develop a PHP Script to illustrate the concept of Array. 3. Develop a PHP Script to illustrate the concept of Functions. 4. Develop a PHP Script to illustrate the concept of Constructor and Destructor. 5. Develop a PHP Script to illustrate the concept of Files and Directory. 6. Write a PHP Code to make PHP Data Base Connectivity with MYSQL. 7. Write a PHP Code to make MYSQL Data Base Operation. 8. Develop a PHP Script to make Data Base Operation using MySQLite. 9. Develop a PHP Script to illustrate the concept of Cookies 10. Develop a PHP Script to illustrate the concept of Sessions	75
Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT520			**Title**	**Batch:**	2021 - 2024
				LAB – VIII -WEB DESIGNING	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	4	**Tutorial Hrs. /Sem.**	0		**Credits:**	02

Course Objective

To create tables and frames, ordered and unordered lists within a web page and learn the language of HTML, DHTML, XML and JavaScript.

To develop dynamic web page using scripting languages and various XML, HTML5 where scripting codes are embedded into HTML document for interactive presentation effect.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Analyze a web page and identify its elements and attributes	K3
CO2	Create a HTML page with formatting text tags, tables and lists	K6
CO3	Create a HTML file with Frames	K6
CO4	Create web pages using DHTML and XML documents	K6
CO5	Build dynamic web pages using JavaScript (client side programming)	K3, K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	H	H	H	H	L	H	M	H	H	H	H
CO3	H	M	H	H	H	H	L	H	H	H	H	H
CO4	H	H	M	H	M	H	H	L	H	M	H	H
CO5	H	H	H	H	H	H	H	H	L	H	H	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Develop static webpages using HTML tags. 2. Prepare a webpage using OL & UL. 3. Prepare Frames which includes four html programs using frames. 4. Design and Develop webpage with the help of HTML and CSS. 5. Develop webpage using event handling in javascript 6. Embedding Javascript in HTML pages. 7. Create a home page using xml. 8. Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration 9. Usage of Internal DTD, External DTD, Entity Declaration. 10. Create a web page using image files, which switch between one another as the mouse Pointer moves over the images.	60
Total Contact Hrs	**60**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT5AL			**Title**	**Batch:**	2021 – 2024
				Advanced Learner Course - I **:** SOFTWARE TESTING	**Semester :**	V
Lecture Hrs./Week or Practical Hrs./Week	SS	**Tutorial Hrs./Sem.**	SS		**Credits:**	04

Course Objective

To study fundamental concepts in software testing and discuss various software testing issues and solutions in software unit test, integration and system testing.

To List a range of different software testing techniques and strategies and be able to apply specific automated unit testing method to the projects.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts and the processes that lead to software testing	K2
CO2	Design test cases from the given requirements using Black box testing techniques	K3
CO3	Identify the test cases from Source code by means of white box testing techniques	K3
CO4	Know about user acceptance testing and generate test cases for it	K4
CO5	Examine the test adequacy criteria to complete the testing process	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	M	H	H	H
CO2	H	M	H	L	H	H	H	M	L	H	H	H
CO3	H	H	M	H	L	H	M	H	H	H	H	H
CO4	H	H	H	M	H	M	H	L	H	H	H	H
CO5	H	H	H	H	M	H	L	H	H	H	H	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.	SS
Unit II	Black-Box Testing: What is Black-Box Testing? - Why Black-Box Testing? – When to do BlackBox Testing? – How to do Black-Box Testing? – Challenges in White Box Testing - Integration Testing: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash.	
Unit III	System and Acceptance Testing: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing – Summary of Testing Phases.	
Unit IV	Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.	
Unit V	Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics	
	(*SS – Self Study)Total Contact Hrs	**SS**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Srinivasan Desikan and Gopalswamy Ramesh	Software Testing Principles and Practices	Pearson Education	2012
2	Limaye M.G	Software Testing Principles, Techniques and Tools	Second Reprint, TMH Publishers	2010.

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	William E. Perry,	Effective Methods of Software Testing	Wiley India, 3rd ed,	2017
2	Renu Rajani, Pradeep Oak,	Software Testing	TMH, 3rd ed,	2014

Web References

1. https://nptel.ac.in/courses/106/101/106101163/
2. https://www.guru99.com/software-testing-seven-principles.html
3. https://www.geeksforgeeks.org/software-engineering-seven-principles-of-software-testing/
4. http://www.cse.hcmut.edu.vn/~hiep/KiemthuPhanmem/Tailieuthamkhao/Introduction%20to%20Software%20Testing.pdf
5. https://www.tutorialspoint.com/software_testing/index.htm

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K.S.Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT5VA			**Title**	**Batch:**	2021 – 2024
				VAC I- IoT (Internet of Things)	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	01	**Tutorial Hrs./Sem.**	-		**Credits:**	2

Course Objective

To imparts a sound understanding of the basic electronics, microcontroller architectures, sensors, IoT architecture and communication protocols.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the scope of the IoT system, architectures, components and supporting technologies.	K2
CO2	Analyzing existing business processes to understand and build technical strategy to develop need aligned technical solutions.	K3
CO3	Apply decision and repetition structures in program design.	K3
CO4	Implement architecture of its networks, devices, programming, data and security.	K4
CO5	Evaluate the data received through sensors in IOT and Design smart city in IOT.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	H
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	L
CO5	H	L	H	M	H	H	M	H	M	H	L	H

*H-High; M-Medium; L-Low

21UCT5VA

Units	Content	Hrs
Unit I	**Introduction:** Definition and characteristics ofIoT – IoT enabling Technologies. IoT Levels – **Domain Specific IoTs**: Home Automation – Cities – Environment.	10
Unit II	**IoT and M2M:** Introduction **-** M2M – Difference between IoT and M2M – Need for IoT system management.	10
Unit III	**IoT platform design methodology:** Introduction -IoT design methodology. **IoT Physical devices and End points:** What is an IoT Device? – Basic building blocks of an IoT device – Exemplary device: Raspberry Pi – About the Board.	10
	Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Vijay Madisetti and Arshdeep Bahga	Internet of Things (A Hands-on-Approach)	1st Edition, VPT	2017

References Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Francis da Costa	Rethinking the Internet of Things: A Scalable Approach to Connecting Everything	1st Edition, A press Publications.	2015

21UCT5VA

Web References

1. https://electronics-project-hub.com/send-data-to-thingspeak-using-esp8266/
2. https://www.instructables.com/id/ESP8266-to-IFTTT-Using-Arduino-IDE/
3. https://virtronics.com.au/Simulator-for-Arduino.html
4. https://www.slideshare.net/MohanKumarG/internetofthings-iot-aseminar-ppt-by-mohankumarg
5. https://blog.infodiagram.com/2019/07/explain-internet-of-things-powerpoint.html

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT5S1			**Title**	**Batch:**	2021 – 2024
				SKILL BASED MAJOR ELECTIVE I – PYTHON LAB	**Semester:**	V
Lecture Hrs./Week or Practical Hrs./Week	2	**Tutorial Hrs./Sem**	0		**Credits:**	03

Course Objective

To understand the basic logic statements, Strings, Lists, Dictionaries and Learn Syntax and Semantics of Python

To Build GUI applications and create Functions in python

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remembering the concept of operators, data types, looping statements in python programming.	K1
CO2	Understanding the concepts of Input / Output operations in file.	K2
CO3	Apply and implement python concept with simple program.	K3
CO4	Analyze the use control structures in programming.	K4
CO5	Design Python scripting language to develop innovative real time applications.	K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	H	H	H	H	H	H	M	H	L	H	H
CO3	H	M	H	H	M	H	L	H	M	H	H	H
CO4	H	H	M	H	H	L	H	H	L	M	H	H
CO5	H	H	H	M	H	H	H	H	H	H	H	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Write a program to demonstrate basic data type in python. 2. Exercise programs on operators & I/O operations. 3. Exercise program on basic control structures & loops. 4. Exercise programs on functions. 5. Simple programming for one dimensional and two dimensional arrays. 6. Write a Python code to explore string functions. 7. Demonstrate the use of Lists, Dictionaries. 8. Write a program to implement Tuples. 9. Exercise programs on files. 10. Exercise programs on Exception handling concepts.	30
Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			Programme Title:	Bachelor of Computer Technology	
Course Code:	21UCT5S2			Title	Batch:	2021 - 2024
				SKILL BASED MAJOR ELECTIVE I – HTML5 WITH CSS LAB	Semester:	V
Lecture Hrs./Week or Practical Hrs./Week	2	Tutorial Hrs./Sem	0		Credits:	03

Course Objective

To get knowledge and practical skill to create dynamic web applications.

To develop an ability to design and implement static and dynamic website.

To Design and develop a Web site using text, images, links, lists, and tables for navigation and layout.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember and Understand the internet related concepts that are vital in understanding web development to create Dynamic Web Applications.	K1, K2
CO2	Evaluate Several Alternatives in the Design of a Web Application.	K5
CO3	Understand the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.	K3
CO4	Comprehend and Propose Web Application Infrastructure and Develop A Functional Web Application.	K2, K3
CO5	Design and develop web pages using CSS styles, internal and/or external style sheets.	K3, K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	L	H	H	H	H	H	H
CO2	H	M	H	H	H	H	H	H	H	H	H	H
CO3	H	H	M	H	L	H	M	H	H	L	H	H
CO4	H	H	H	H	M	H	L	H	M	H	H	H
CO5	H	H	M	H	H	H	H	H	H	H	M	H

*H-High; M-Medium; L-Low

Content	Hrs
Sample Programs 1. Write HTML code to develop a static web page having the background and title page in any other color. 2. Create a page to show different attribute of Font tags and italic, bold, underline. 3. Create a page to show different attribute Design a Signup form with validation using HTML5. 4. Create a webpage with HTML5, Use paragraph and list tags. 5. Design a webpage and display it using HTML in tabular format. 6. Design a CSS to create menu. 7. Create a web page using all the attributes of the frame 8. Write a program to draw any shape using canvas tag. 9. Write a program to include video/Audio file in HTML5 page 10. Write a program to Drag and Drop the content in HTML5.	30
Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

SEMESTER- VI

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT621			**Title**	**Batch:**	2021 – 2024
				Core XIII: FRAMEWORK TECHNOLOGY	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	08		**Credits:**	04

Course Objective

To provide in depth knowledge on VB.NET and ASP.NET and making them to develop dynamic web applications, websites using window controls and web controls.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of .NET framework and its components.	K1 / K2
CO2	Acquire the usage of various Elements of VB.Net to develop programs using them	K3
CO3	Implement lists and loops with VB.NET controls and iteration	K3
CO4	Assemble multiple forms, modules, and menus into working VB.NET solutions	K3/K4
CO5	Connect database by using ADO.NET and manipulate the database	K4/K5

Mapping

PO /PSO CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	H	M	L	H	M
CO3	H	M	L	M	H	M	H	H	M	M	H	M
CO4	M	H	M	H	M	H	M	L	H	H	M	H
CO5	H	M	H	M	H	M	H	H	M	M	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction to Visual Basic .NET**: Visual Basic .NET- Introduction to Microsoft.NET- .NET Framework and the common language runtime. Introduction to the Visual Studio.NET IDE: Introduction – Overview of the visual studio .NET IDE - Menu bar and Toolbar –Visual Studio.NET IDE windows. **Introduction to Visual Basic Programming:** Introduction – simple programs – memory concepts- Arithmetic - Decision Making – Using a dialog to display a message.	18
Unit II	**Control Structures**: Introduction – Control Structures- if/then selection structure- if/then/else Selection Structure – While, Do while/loop, Do Until/Loop Repetition Structures –Assignment Operators* – For Next – Select Case – do/loop while – do/loop until – exit key word – logical operators. **Procedures:** Introduction – Modules, classes and procedures – sub procedures – function procedures – methods – Arguments Promotion – Option Strict and Data type conversions – value types and reference types – passing arguments: pass – by-value vs. pass-by-reference – duration of identifiers – scope rules.	18
Unit III	**Arrays**: Introduction - arrays - declaring and allocating arrays - examples - passing arrays to procedures - By Val vs By Ref. – for each/next repetition structure. **Graphical user interface concepts**: Introduction – windows forms – event handling model – control properties and layout – labels, textboxes and buttons – group boxes and panels – checkboxes and radio buttons* – picture boxes – mouse event handling – keyboard event handling. Menus – Link labels – List boxes and checked list boxes – Combo boxes – Tree views – List views – Tab control –MDI windows – Visual inheritance – User defined controls.	18
Unit IV	Database, SQL and ADO.NET: Introduction – relational database model- SQL – ADO.NET object model – programming with ADO.NET – extracting from a database – modifying a database	18
Unit V	ASP.NET, web forms and web controls: Introduction – simple HTTP transaction – system architecture – web controls – session tracking	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Deitel H.M, Deitel P.J, Nieto T.R	Visual Basic.NET How to Program	Pearson Education , 6th Edition	2012

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Kogent Learning Solutions Inc.,	.Net 3.5 Programming: Covering.Net Framework	1st Edition , DreamTech Press.	2015
2	Bill Evjen, Jason Beres, et.al,	Visual Basic.Net Programming – Black Book	2nd Edition , John Wiley & Sons	2014
3	Gary B. Shelly Thomas J. Cashman,	Microsoft Visual Basic. Net Comprehensive Concepts And Techniques	Cengage Learning India ,1st Edition	2016

Web References

1. https://www.w3schools.com/asp/
2. https://www.tutorialspoint.com/vb.net
3. https://www.nptelvideos.com/visualbasic_net/?pn=1
4.https://www.javatpoint.com/vb-net-control-statements
5. https://www.tutorialspoint.com/ASP.net

21UCT621

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E1			**Title**	**Batch:**	2021 – 2024
				Core Elective II: MOBILE COMPUTING	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	4		**Credits:**	5

Course Objective

1. Understand the various concepts and techniques of WAP, GSM, CDMA, 2G, and 3G.
2. Gain knowledge about different mobile platforms and application development.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand various networks, standards, communication medium, Spread spectrum technology	K1/K2
CO2	Analyze the basic concepts of wireless networks.	K2/K3
CO3	Deploy the mobile applications to the devices.	K3
CO4	Demonstrate basic skills for cellular networks design.	K4/K5
CO5	Examine to design and develop mobile computing solutions using various components of mobile computing	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	L	H	M	H	M	H	H	M	M	L	M
CO3	H	M	H	M	H	M	H	H	M	M	H	M
CO4	M	H	M	H	M	H	M	L	H	H	M	H
CO5	H	M	H	M	L	M	H	H	M	M	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Introduction: Mobility of Bits and Bytes –Wireless the Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services - Security in mobile computing – Standards _ Why is it necessary – Standard bodies. Mobile Computing Architecture: Architecture for mobile computing – Three-tier architecture – Mobile computing through Internet – Making existing applications mobile enabled.	18
Unit II	Mobile Computing Through Telephony: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application –Voice XML – TAPI. Emerging Technologies: Blue Tooth – RFID – WiMAX – Mobile IP – IPv6 – Java Card.	18
Unit III	GSM: Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM – PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations – Authentications and Security. SMS: Strengths – Architecture – SM MT – SM MO – VAS through SMS	18
Unit IV	GPRS: GPRS and packet data network – Architecture – Network Operations – Data services – Applications - Limitations – Billing and Charging. WAP: WAE – User agent & UAProf – WML – WSP – WTP – WDP – Gateway. MMS: Architecture – Transaction Flows	18
Unit V	CDMA and 3G: Spread spectrum technology. IS 95: Speech and Channel Coding – Architecture – Channel Structure. CDMA vs. GSM – Wireless Data. 3G: IMT & CDMA 2000 – Applications on 3G. Wireless LAN: Advantages – IEEE 802.11 standards – Types – 802.11 Architecture – Mobility – Deploying – Mobile Ad Hoc networks and sensor networks – Security – Wi-Fi vs. 3G	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal	Mobile Computing: Technology, Applications and Service Creation	TMH, 2nd Edition	2017

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Jochen Schiller	Mobile Communication	Pearson Education Asia, 2nd Edition	2017
2	Christoffer Andersson	GPRS and 3G Wireless Applications	John Wiley and son's	2012
3	Raj Kamal	Mobile Computing	Oxford University Press, 3rd Edition	2019

Web Resources

1. https://nptel.ac.in/courses/106/106/106106147/
2. https://www.tutorialspoint.com/mobile_computing/index.htm
3. https://minigranth.in/mobile-computing-tutorial/bluetooth-technology-mobile-computing
4. https://www.educba.com/gprs-architecture/
5. https://www.javatpoint.com/wireless-lan-introduction

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E2			**Title**	**Batch:**	2021 – 2024
				Core Elective II: SOFTWARE PROJECT MANAGEMENT	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	04		**Credits:**	5

Course Objective

1. To provide the graduates to identify key areas of concern over Project Life Cycle (PLC) and use of project management principles across all the phases of PLC.
2. To understand the importance and necessity of project plan and how it is helpful to project manager in monitoring and controlling the various aspects of the project

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the activities of Software Project Management	K2
CO2	Select appropriate approach for software project	K2/K3
CO3	Manage people in software environment	K3
CO4	Create a critical path and a precedence network for a project.	K4
CO5	Generate project schedule and can construct, design and develop network diagram for different type of Projects.	K4/K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	L	H
CO2	H	M	L	M	H	M	H	M	H	M	H	M
CO3	H	M	H	M	H	M	H	L	H	M	H	M
CO4	M	H	M	H	M	H	M	H	M	H	M	H
CO5	L	M	H	M	H	M	H	M	H	M	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Introduction to Software Project Management, Why is software project management is important?, What is Project, Software Project vs other types of project, Activities covered by Software Project Management Plans, Methods and Methodologies, Categorizing software Projects, Stakeholder, Setting Objectives, Project success and Failure. What is Management? Management Control, Traditional and modern Project Management Practices.	18
Unit II	An overview of Project Planning: Step 0 to 10, Selecting of an Appropriate Project Approach: Choosing methodologies and Technologies, Software Processes and Software Models, The Waterfall Model, The Spiral Model, Software Prototyping, other ways of categorizing prototypes, Incremental Delivery, RAD and Agile Methods: Extreme programming, Scrum.	18
Unit III	Software Effort Estimation: Introduction, Where are Estimates Done? Software Effort Estimation Techniques, Bottom up Estimating, The Top Down Approach, Expert Judgement, Function Point Analysis, COCOMO Model, Activity Planning	18
Unit IV	Risk Management: Risk, Categories of Risk, A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Applying PERT Technique. Resource Allocation.	18
Unit V	Monitoring and Control, Managing People in Software environments.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Bob Hughes, Mike Cotterell, Rajib Mall	Software Project Management	Tata McGraw Hill Publications, 6th Edition	2017

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Roger S. Pressman	Software Engineering	Tata McGraw Hill Publications, 8th Edition	2019
2	John M. Nicholas and Herman Steyn	Project Management for Engineering, Business and Technology	Taylor&Francis, 5th Edition	2016
3	Er. Rishabh Anand	Principles of Software Project Management	S.K. Kataria & Sons, 1st Edition	2014
4	Walker Royce	Software Project Management-A Unified Framework	Pearson publication, 1st Edition	2015

Web Resources

1. https://nptel.ac.in/courses/106/105/106105218/
2. https://freevideolectures.com/course/4071/nptel-software-project-management
3. https://www.nptelvideos.com/video.php?id=918
4. https://www.classcentral.com/course/swayam-software-project-management-14294
5. https://www.w3schools.in/sdlc-tutorial/software-development-life-cycle-sdlc

21UCT6E2

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E3			**Title**	**Batch:**	2021 – 2024
				Core Elective II: GRID COMPUTING	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	04		**Credits:**	5

Course Objective

To provide a thorough knowledge about the technology application and tool kits for grid computing

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understanding the fundamentals of grid computing	K1
CO2	Discussing the basics of grid monitoring.	K2/K3
CO3	Dissect Grid Computing Systems and Architectures	K4
CO4	Analyze the importance of Grid Computing Standards	K4/K5
CO5	Examine the standards supporting Grid Computing services and Functionality	K5

Mapping

PO /PSO CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	L	H	H	H	H	H
CO2	H	M	H	M	H	M	H	M	H	M	H	M
CO3	H	M	H	L	H	M	H	M	H	M	H	M
CO4	L	H	M	H	M	H	M	H	M	H	M	H
CO5	H	M	H	M	H	M	H	M	H	L	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Introduction: Grid Computing-Key Issues – Applications – Other Approaches – Grid Computing Standards – Pragmatic Course of Investigation.	18
Unit II	Grid Benefits & Status of Technology: Motivations – History of Computing, Communications and Grid Computing – Grid Computing Prime Time – Suppliers and Vendors –Economic Value – Challenges.	18
Unit III	Components of Grid Computing Systems and Architectures: Basic Constituent Elements-A Functional View – A Physical View – Service View.	18
Unit IV	Grid Computing Standards-OGSI: Standardization – Architectural Constructs –Practical View – OGSA/OGSI Service Elements and Layered Model – More Detailed View.	18
Unit V	Standards Supporting Grid Computing-OGSA: Functionality Requirements – OGSA Service Taxonomy – Service Relationships – OGSA Services – Security Considerations.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Daniel Minoli	A Networking Approach to Grid Computing	John Wiley & Sons, Inc, 1st Edition	2010

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Joseph	Grid Computing	Pearson Education India	2014
2	Kai Hwang, Geoffery C. Fox and Jack J. Dongarra	Distributed and Cloud Computing: Clusters, Grids, Clouds and the Future of Internet	Morgan Kaufman Publisher,1st Edition	2012
3	Jorge G Barbosa , Ines Dutra	Grid Computing: Techniques & Future Prospects	Nova Science Publishers Inc, 1st Edition	2015

Web Resources

1. https://www.slideshare.net/poojadixit19/grid-computing-standards
2. http://www.cs.kent.edu/~farrell/grid06/lectures/grid08.pdf
3. https://www.geeksforgeeks.org/grid-computing/
4. http://www.cs.kent.edu/~farrell/grid06/lectures/grid01.pdf
5. https://pit.ac.in/pitnotes/uploads/CS6703_II.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E4			**Title**	**Batch:**	2021 – 2024
				Core Elective III: ARTIFICIAL INTELLIGENCE	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	04		**Credits:**	5

Course Objective

To embed a deep knowledge about search techniques, reasoning, game playing, expert systems and prolog.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about the artificial intelligence problem and the characteristics of the problem space	K1
CO2	Understand the problem solving using predicates.	K1/K2
CO3	Apply the concepts of game playing techniques and Expert system	K3
CO4	Analyze AI problem to be solved using prolog	K4
CO5	Evaluate different knowledge representation schemes for AI problems	K4 /K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	L	M	M	H	L
CO3	H	M	H	M	L	M	H	H	M	M	H	M
CO4	M	H	M	H	M	H	M	M	H	H	L	H
CO5	H	L	H	M	H	M	H	H	M	M	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Problems and search: AI Techniques-Defining the problem as a State Space Search – Production Systems – Problem Characteristics – Production system Characteristics – Heuristic Search Techniques – Generate and test – Hill Climbing – Best-first Search – Problem Reduction – Constraint Satisfaction – Mean-Ends Analysis.	18
Unit II	Knowledge Representation: Representations and Mappings- Approaches to Knowledge Representation – Issues in knowledge representation – Representing simple Facts in Logic – Representing Instance and Isa Relationships- Procedural versus Declarative Knowledge – Logic Programming – Forward versus Backward reasoning.	18
Unit III	Semantic Nets: Frames - Conceptual Dependency - Game Playing – Overview– The minimax search procedure – Adding Alpha - Beta cutoffs.	18
Unit IV	Expert System : Definition – Characteristics of Expert System – Architecture & Description of Modules – Backward Chaining – Knowledge Acquisition facility. Knowledge Engineering – Expert System Life Cycles – Expert System Tools.	18
Unit V	Prolog: The Introduction-Converting English to prolog facts and rules – goals – Terminology – Variables - Control structures - Arithmetic operators - Matching in Prolog – Backtracking – cuts – Recursion – Lists - Dynamic Databases - I/O Streams - Some aspects specific to LPA Prolog	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Elaine Rich, Kevin Knight, Shivashankar B Nair	Artificial Intelligence	Tata McGraw Hill , 3rd Edition	2017

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Stuart Russell, Peter Norvig	Artificial Intelligence: A Modern Approach	Pearson Education, 3rd Edition.	2015
2	Er. Rajiv Chopra	Artificial Intelligence: A Practical Approach	S. Chand Publications, 1st Edition.	2016

Web Resources

1. https://nptel.ac.in/courses/106/102/106102220/
2. http://aimaterials.blogspot.com/p/syllabus.html
3. https://www.javatpoint.com/expert-systems-in-artificial-intelligence
4. https://www.tutorialspoint.com/prolog/prolog_introduction.htm
5. https://www.cet.edu.in/noticefiles/271_AI%20Lect%20Notes.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E5			**Title**	**Batch:**	2021 – 2024
				Core Elective III: UNDERWATER COMMUNICATION	**Semester:**	VI
Lecture Hrs./Week	06	**Tutorial Hrs./Sem.**	04		**Credits:**	5

Course Objective

To study the feasibility and propose solutions to integrate multimedia traffic in the underwater wireless communication network paradigm.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Underwater Environment	K1/K2
CO2	To understand the role of Radar, Antennas, Signals in underwater network Communication.	K2/K3
CO3	To apply different modes of underwater applications	K3
CO4	To analyze various issues associated with under water communication	K4/K5
CO5	Justify the importance of various Under Water Acoustic Software	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	L	H	H	H	M	H	H	H	H
CO2	H	M	H	M	H	M	H	H	L	M	H	M
CO3	H	M	H	M	H	M	H	H	H	M	H	M
CO4	M	H	L	H	M	H	M	L	M	H	M	L
CO5	H	M	H	M	H	M	H	M	H	M	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Underwater Acoustics: The Development – Exploring the Underwater Environment - Historical Highlights – The pioneers – Civilian developments – The Basic Oceanography – Depth variations. Outline of Underwater Applications: Military applications – Civilian applications.	18
Unit II	Underwater Networking Basics: Underwater Acoustic Infrastructure – Offshore Terrestrial Station - Radar Networks –Data Handling of an Underwater Network – Data Tabulation. Types of Signals – Acoustic Modem – Boosters – Antennas – Receivers – Surface Buoy – Gliders – Yatch/Sailing Boats - Networking of submarines. Underwater electro acoustic transducers –Transducer modeling and design – installation.	18
Unit III	Underwater Sensor Networks: Ocean Sampling Networks, Pollution Monitoring, Environmental Monitoring and Tactical surveillance systems, Major challenges in design of Underwater Sensor Networks - Factors that affect the UWSN-Sensor Node ArchitectureGIBS, VRAP, DABSRAPT. Underwater Communication Protocols: Routing Protocols – GPS. Autonomous Underwater Vehicles – Topologies – Servers and Databases - Network Coding – Security issues.	18
Unit IV	Water Column Applications: Navigation – Military applications – Fishery Acoustics – Physical Oceanography – Tsunami Applications - Underwater Intervention. Marine Animal Acoustics: Marine mammal bioacoustics Fish bioacoustics – Acoustic Pollution of the Ocean	18
Unit V	Case Study: Under Water Acoustic Software: AcTUP V2.2 L – Underwater Sound Recorder – Sail Tool Software – Sail Imaging Software.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Lurton and Xavier	An Introduction to Underwater Acoustics: Principles and Applications	Springer, 2nd Edition	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Yang Xiao	Underwater Acoustic Sensor Networks	CRC Press, 1st Edition	2019
2	Dimitri Sotnik, Michael Goetz, et al	Cognitive Underwater Acoustic Networking Techniques	Springer, 1st Edition	2020

Web Resources

1. https://www.youtube.com/watch?v=FYk1tbTKkVI
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5539468/
3. https://www.whoi.edu/science/B/people/kamaral/marinemammalacoustics.html
4. https://en.wikipedia.org/wiki/Communication_with_submarines
5. Curtin University : http://cmst.curtin.edu.au/products/underwater/

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Jayaprakash Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6E6			**Title**	**Batch:**	2021 – 2024
				Core Elective III: DIGITAL IMAGE PROCESSING	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	06	**Tutorial Hrs./Sem.**	04		**Credits:**	5

Course Objective

1. To learn and understand the fundamentals of image processing and its relationship between pixels.
2. To understand the key concepts of image compression this estimates the degradation function

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand about the fundamentals of digital image processing, Sampling and quantization.	K1/K2
CO2	Acquire image enhancement, histogram processing and Filtering techniques	K2/K3
CO3	Apply image restoration and transformations, color fundamentals and its models	K3
CO4	Analyze the importance of image compression and morphological issues in image processing	K4
CO5	Exploring the concepts of Image segmentation	K5/K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	M	H	H	M	M	H	M
CO3	H	L	H	M	H	M	H	H	M	M	L	M
CO4	M	H	M	H	M	H	M	M	H	H	M	H
CO5	H	M	H	M	L	M	H	H	M	M	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Introduction:** Digital image processing - Fundamental steps in digital image processing - components of image processing system. Digital Image Fundamentals: A simple image formation model -image sampling and quantization - basic relationships between pixels.	18
Unit II	**Image Enhancement in the Spatial Domain:** Basic gray-level transformation – histogram processing, enhancement using arithmetic and logic operators - basic spatial filtering – smoothing and sharpening spatial filters - combining the spatial enhancement.	18
Unit III	**Image Restoration**: A model of the image degradation/restoration process – noise models - restoration in the presence of noise–only spatial filtering - Weiner filtering – constrained least squares filtering - geometric transforms; Introduction to the Fourier transform and the frequency domain - estimating the degradation function	18
Unit IV	**Color Image Processing**: Color fundamentals - color models - pseudo color image processing - basics of full– color image processing - color transforms - smoothing and sharpening - color segmentation. Image Compression: Fundamentals - image compression models - error-free compression –lossy predictive coding - image compression standards	18
Unit V	**Morphological Image Processing**: Preliminaries - dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms. Image Segmentation: Detection of discontinuous - edge linking and boundary detection – thresholding - region–based segmentation. Object Recognition: Patterns and patterns classes - recognition based on decision– theoretic methods.	18
	Total Contact Hrs	**90**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	RafealC.Gonzalez, Richard E.Woods	Digital Image Processing	Pearson Education, Fourth Edition	2018
2	S. Sridhar	Digital Image Processing	Oxford University Press	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Jain	Fundamentals of Digital Images Processing	Pearson Education India, 1st Edition	2015
2	S. Jayaraman, S. Esakkirajan, T. Veerakumar	Digital Image Processing	McGraw Hill, 2nd Edition	2020

Web Resources

1. https://swayam.gov.in/nd1_noc19_ee55/preview
2. https://nptel.ac.in/courses/117/105/117105079/
3. https://www.coursera.org/learn/digital
4. https://www.tutorialspoint.com/dip/index.htm
5. https://www.electronicsforu.com/videos-slideshows/digital-image-processing

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. A. Kalaivani Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT622			**Title**	**Batch:**	2021 – 2024
				Core Lab - IX : FRAMEWORK TECHNOLOGY	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	05	**Tutorial Hrs./Sem.**	0		**Credits:**	03

Course Objective

The student learn how to design, code, test and debug programs using VB.Net and ADO.Net.

To utilize .NET framework to build distributed enterprise applications.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Analyze and apply the VB.NET IDE Framework	K3
CO2	Develop, design and implement VB.Net program using various controls.	K4
CO3	To validate the concept of files and exception handling mechanism	K5
CO4	Implement ADO.Net connectivity	K4
CO5	Create their own applications with reports.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	L	H
CO2	L	M	H	M	H	M	H	L	H	M	H	M
CO3	H	M	H	M	H	M	H	M	H	M	H	L
CO4	M	H	M	L	M	H	M	H	M	H	M	H
CO5	H	M	H	M	H	M	H	M	H	L	H	M

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit 1	**Sample Programs** **<u>VB.NET – Console Application</u>** 1. Create a Console Application for a simple stack operation in VB.Net 2. Create a Console Application for a simple queue operation in VB.Net 3. Develop a console application to illustrate the concept of exception handling using VB.Net 4. Develop a console application to illustrate the concept of Hash table using VB.Net 5. Develop a console application to illustrate the concept of Inheritance 6. Develop a console application to illustrate the concept of File handling **<u>VB.NET – Windows Application</u>** 1. Develop a Windows Form Application to generate the Bio-Data of a student 2. Develop a Windows Form Application to illustrate the concept of Tree-Node Control 3. Develop a Windows Form Application to perform the operations of a calculator 4. Develop a Windows Form Application to calculate and generate a telephone a bill 5. Develop a Windows Forms application to create and generate an E.B. Bill 6. Develop a Windows Form application to perform the operations of a Banking System. 7. Develop a windows forms application to create a notepad. 8. Create a Windows form application to develop a Basic Login form 9. Create a Windows Form application to develop an Employee Pay slip 10. Create a Windows Form application to develop a Vehicle invoice generation System 11. Create a Windows Form application to develop a Library book issue details system.	75
	Total Contact Hrs	**75**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc.			Programme Title:	Computer Technology	
Course Code:	21UCT623			Title	Batch:	2021 – 2024
				Project	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	4		Credits:	4

Course Objective

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.
4. Express technical and behavioral ideas and thought in oral settings.
5. Prepare and conduct oral presentations

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To recollect the programming language concepts to think objectively, analytically, critically in developing industry oriented applications	K3
CO2	To comprehend about the data base connectivity using front end and back end tools	K4
CO3	To validate the application software by various types of testing and its implementation in real environment	K5
CO4	Design engineering solutions to complex problems utilizing a systems approach.	K4
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer.	K5/K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	H	H	H	H
CO2	H	M	H	M	H	M	H	H	H	M	H	M
CO3	H	M	H	M	H	M	H	H	H	M	H	M
CO4	M	H	M	H	M	H	M	H	H	H	M	H
CO5	H	M	H	M	H	M	H	H	H	M	H	M

* H-High; M-Medium; L-Low

COMPUTER SCIENCE PROJECT and VIVA VOCE

Guidelines

Introduction

The title of the project work and the organization will be finalized at the end of fifth Semester. Each student will be assigned with a Faculty for guidance. The Project work and coding will be carried by using the facility of computer science lab as well as in the organization. Periodical review will be conducted to monitor the progress of the project work. Project report will be prepared and submitted at the end of the semester. External examiner appointed by the Controller of Examination will conduct the viva voce examination along with respective guide.

Area of Work

- Web Based Development
- Mobile app development
- Website development
- IoT Projects
- Big Data and Data Mining Projects
- Cloud Computing Projects
- Networking Projects
- Artificial Intelligence and Machine learning Projects
- Data Analytics Projects using Python, R, Tableau etc..
- System Software
- Web Security Projects
- Image Processing

Methodology

Arrangement of Contents

The sequence in which the project report material should be arranged and bound as follows:

1. Cover Page & Title Page
2. Bonafide Certificates
3. Declaration
4. Acknowledgement
5. Synopsis
6. Table of Contents
7. Chapters
8. Appendix
9. References

Format of Table of Contents

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2.1.2 Drawbacks

2.2 Proposed System

2.3 Planning and Scheduling

3 System Design

3.2 Overview of the Project

3.1 Modules of the Project

3.2 Input Design Format

3.3 Output Design

3.4 Table Design

3.5 Supporting Diagrams (ER/DFD/Use Case)

4 Implementation and Testing

4.1 Coding Methods

4.2 Testing Approach

4.3 Implementation and Maintenance

5 Project Evaluation

5.1 Project Outcome

5.2 Limitation of the Project

5.3 Further Scope of the Project

6 Conclusion

7 Appendix

7.1 Source Code

7.2 Screenshots and Reports

8 References

Size of the Project

The Project Report contents should be maximum of not exceeding 70 pages.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6AL			**Title**	**Batch:**	2021 – 2024
				Advanced Learner Course - II **:** DATA ANALYTICS	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	SS	**Tutorial Hrs./Sem.**	SS		**Credits:**	04

Course Objective

To understand the fundamentals of big data analytics and the methodologies used in storing manipulating and analyze large volumes of unstructured data

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	This course prepares students to gather, describe, and analyze data, and use advanced statistical tools to support decision making	K2
CO2	To gather sufficient relevant data, conduct data analytics using scientific methods, and understand appropriate connections between quantitative analysis and real world problems	K3
CO3	Understand the exact scopes and possible limitations of each method to provide constructive guidance in decision making.	K3
CO4	To Use advanced techniques to conduct thorough and insightful analysis, and interpret the results correctly with detailed and useful information.	K4
CO5	To make better decisions by using advanced techniques in data analytics.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	M	H	H	H
CO2	H	M	H	L	H	H	H	M	L	M	H	M
CO3	H	H	M	H	L	H	M	H	H	H	L	H
CO4	H	H	H	M	H	M	H	L	H	M	H	H
CO5	H	H	H	H	M	H	L	H	H	H	H	M

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Data Definitions and Analysis Techniques: Elements, Variables, and Data Categorization, Levels of Measurement, Data Management and Indexing	SS
Unit II	Descriptive Statistics: Measures of Central Tendency, Measures of Location of Dispersions, Error Estimation and Presentation (Standard Deviation, Variance), Introduction to Probability	
Unit III	Basic Analysis Techniques: Statistical Hypothesis Generation and Testing, Chi-Square Test, T-Test, Analysis of Variance, Correlation Analysis, Maximum Likelihood Test	
Unit IV	Data Analysis Techniques-I: Regression Analysis, Classification Techniques, Clustering Techniques (K-Means, K-Nearest Neighborhood)	
Unit V	Introduction to R Programming: Introduction to R Software Tool, Statistical Computations using R (Mean, Standard Deviation, Variance, Regression, Correlation etc.)	
	(*SS – Self Study)Total Contact Hrs	**SS**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Ronald E Walppole, Raymond H Myres, Sharon L. Myres and Leying Ye	Probability and statistics for Engineers and Scientists	Prentice Hall Inc, 9th Edition	2012
2	Travor Hastie Robert Tibshirani Jerome Friedman	The Elements of Statistical Learning, Data Mining, Inference, and Prediction	Springer, 2nd Edition	2014
3	John M. Chambers	Software for Data Analysis: Programming with R (Statistics and Computing)	Springer, 2nd Edition	2016

Reference Books

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Radha Shankarmani , M. Vijayalakshmi,	Big Data Analytics	Wiley, 2nd Edition	2016
2	Paul Kinley	Data Analytics for Beginners: Basic Guide to Master Data Analytics	CreateSpace Independent Publishing Platform	2016

Web References

1. https://www.javatpoint.com/what-is-big-data 2
2. http://www.guru99.com/bigdata-tutorials.html
3. https://nptel.ac.in/courses/110/106/110106072/
4. https://hackr.io/blog/what-is-data-analysis-methods-techniques-tools
5. https://www.tutorialspoint.com/r/index.htm

21UCT6AL

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. C. Keerthana Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Science (Computer Technology)	
Course Code:	21UCT6VA			**Title**	**Batch:**	2021 – 2024
				VAC-II: PC ASSEMBLY AND CCTV INSTALLATION	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	02	**Tutorial Hrs./Sem.**	2		**Credits:**	2

Course Objective

This course enables the students to understand the fundamentals of PC Assembly and CCTV Installation

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Assemble/setup and upgrade personal computer systems	K2
CO2	Knowledge of CCTV components with modern equipments	K3
CO3	Identify and Optimize system performance techniques	K3
CO4	Know about Install and connect peripherals among different devices	K4
CO5	Diagnose and isolate faulty components of the devices	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H	L	H	H	H
CO2	H	M	H	M	H	H	M	H	M	H	M	L
CO3	H	M	H	M	H	L	M	H	M	H	M	H
CO4	M	H	L	H	M	M	H	M	H	M	H	M
CO5	H	L	H	M	H	H	M	H	M	L	M	H

*H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	Computer Components – Computer Tools – Computer Case Preparation - Mother Board - Installing a CPU - Installing a Computer Memory. Installing a Mother Board - Installing a Power Supply - Computer Wiring - Installing a Hard Drive – DVD Drive.	10
Unit II	Installing a Graphics Card – Booting the computer – Install Drivers – Installing Windows 7 and10 – Trouble Shooting – Case Study.	10
Unit III	Electronic Surveillance : Objective : Introduction to Electronic Surveillance - Introducing CCTV - CCTV Technology - Designing of the CCTV System: Objective - Pre-Installation Activities - Customer Requirements and Site Analysis - Selection of Components	10
	Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Text Book References

S.NO	AUTHOR	TITLE OF THE BOOK	PUBLISHERS \ EDITION	YEAR OF PUBLICATION
1	Prabhu	CCTV Camera Installation Training	1st ed, CHIP SYSTEMS	2019

Web References

1.	https://www.build-your-own-computer.net/support-files/build-your-own-computer.pdf
2.	CCTV Installation Technician – National Skill Development Corporation – Facilitator Guide
3.	https://nsdcindia.org/sites/default/files/FG-ELEQ4605-CCTV-Installation-Technician-09-03-2018.pdf
4.	https://www.instructables.com/id/How-To-Assemble-A-Basic-Desktop-PC/
5.	https://choosemypc.net/assemblyguide/
6.	http://ptgmedia.pearsoncmg.com/images/9781587132636/samplechapter/9781587132636_ch03.pdf

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Dr. R. Rajasenathipathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			**Programme Title:**	Bachelor of Computer Technology	
Course Code:	21UCT6S1			**Title**	**Batch:**	2021 - 2024
				SKILL BASED MAJOR ELECTIVE II – DATA ANALYTICS (BIG DATA) LAB	**Semester:**	VI
Lecture Hrs./Week or Practical Hrs./Week	2	**Tutorial Hrs./Sem**	0		**Credits:**	02

Course Objective

To educate the basic techniques for extracting information from large datasets such as the web and large document repositories.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	To keep in mind about the data analysis using Excel.	K3
CO2	To realize about sorting, cost benefit analysis, calculating mean and standard deviation	K4
CO3	To validate the use of analysis tools to conduct regression and forecasting and calculate descriptive statistics	K5
CO4	Visualize the data using basic graphs and plots	K4
CO5	Dissect the outliers if any in the data set and adapt techniques for handling multi-dimensional data	K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	H	H	H	H	M	H	H	H	H
CO2	H	H	H	H	H	H	H	H	L	H	H	M
CO3	H	H	H	M	H	L	H	H	H	M	H	H
CO4	L	H	L	H	L	H	M	M	L	H	M	H
CO5	H	H	H	H	M	H	H	H	H	M	H	L

* H-High; M-Medium; L-Low

Units	Content	Hrs
Unit I	**Sample Programs** 1. Illustrates how to create a basic spreadsheet by entering text, numbers, and formulas. 2. Illustrate the formatting of cells and columns. 3. Create a spreadsheet to perform "what if?" calculations using Built-in functions. 4. Demonstrate the ease of creating charts. 5. Sort the data and print portions of a worksheet. 6. Illustrates how to dress up a table using special formats and how to export a table or chart into a Microsoft Word document. 7. Demonstrate a basic cost-benefit analysis using Excel. 8. Consolidate several worksheets into one and to link several worksheets to a master worksheet. 9. Illustrate the use of analysis tools for conducting bivariate regression and forecasting. 10. Use a worksheet to calculate descriptive statistics (e.g., mean, standard deviation)	30
	Total Contact Hrs	**30**

Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.

Course Designed by	Verified by HOD	Checked by	Approved by
Name and Signature	Name and Signature	Co-ordinator CDC	COE
Name: Ms. K. S. Leelavathi Signature:	Name: Dr. R. Rajasenathipathi Signature:	Name: Mr. K. Srinivasan Signature:	Name: Dr. R. Manickachezian Signature:

Programme Code:	B.Sc. CT			Programme Title:	Bachelor of Computer Technology	
Course Code:	21UCT6S2			Title	Batch:	2021 - 2024
				SKILL BASED MAJOR ELECTIVE II - DREAMWEAVER LAB	Semester:	VI
Practical Hrs./Week	2	Tutorial Hrs./Sem	0		Credits:	02

Course Objective

To focus on using Adobe Dreamweaver to create high quality websites.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the basic tools and components of a multimedia project.	K2
CO2	Create a website that adheres to current HTML and CSS	K3
CO3	Realize appropriate terminology to describe both web development and basic programming concepts	K4
CO4	Apply programs by implementing PHP, CSS, JavaScript, JSP, HTML in Dream Weaver	K5
CO5	Design and develop advanced aspects of the Dreamweaver interface and paradigm	K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	H	H	M	H	H	H	H	M	H	H	M	H
CO2	H	M	H	L	H	H	H	H	L	H	H	M
CO3	H	H	H	M	H	L	H	H	H	M	H	H
CO4	M	H	L	H	L	H	M	H	H	H	H	H
CO5	H	H	H	H	M	H	H	H	H	M	L	H

* H-High; M-Medium; L-Low

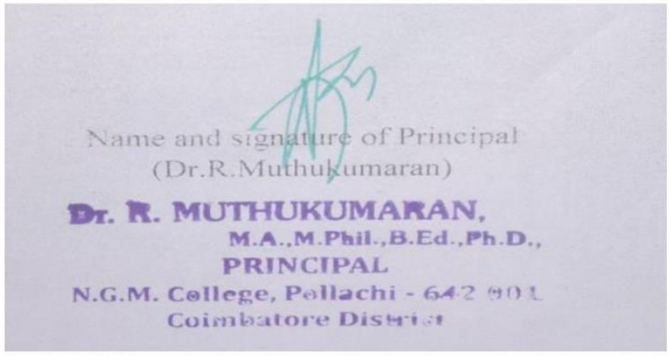
Units	Content	Hrs
Sample Programs	**Using Dreamweaver**, 1. Create a picture gallery 2. Create a template 3. Create a CSS text rollover 4. Create a Mail-To links 5. Create a website 6. Create a link to different pages from the same image 7. Create List Menus 8. Create Submit buttons 9. Create Links without an Underline using CSS 10. Create a program using CSS 11. Working PHP, CSS, JavaScript, JSP, HTML in Dream Weaver.	30
	Total Contact Hrs	**30**

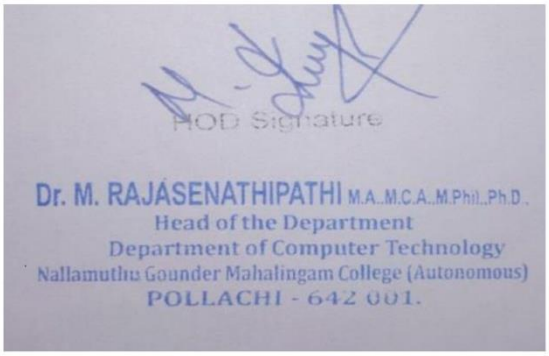
Pedagogy

Direct Instruction, Flipped Class, Digital Presentation

Assessment Methods

Seminar, Quiz, Assignments, Group Task.


Name and signature of Principal
(Dr.R.Muthukumaran)
Dr. R. MUTHUKUMARAN,
M.A.,M.Phil.,B.Ed.,Ph.D.,
PRINCIPAL
N.G.M. College, Pollachi - 642 001.
Coimbatore District


HOD Signature
Dr. M. RAJASENATHIPATHI M.A.,M.C.A.,M.Phil.,Ph.D.,
Head of the Department
Department of Computer Technology
Nallamuthu Gounder Mahalingam College (Autonomous)
POLLACHI - 642 001.