B.C.A. Programme Code - UCA

Thiagarajar College, Madurai. 41st ACM - Department of CA & IT - Syllabus 2020 L1

Knowledge

Able to understand and apply the fundamental principles, concepts and methods in diverse areas of computer applications, mathematics, statistics etc.,

Problem analysis and Development of Solutions

Identify, formulate, research literature and analyze real- time problems. Attain substantiated conclusions to solve the problems using fundamental principles of mathematics, computing sciences by adopting various tools and techniques.

Ethics and Social Responsibility

Understand and commit to professional ethics and cyber regulations, responsibilities and norms of professional computing practice.

Communication and Team Building

Possess interpersonal skills and communicate effectively with the professionals and with society at large on system activities. Able to comprehend and write effective reports, design documentation, make effective presentations, and give/understand instructions.

Life-long Learning

Recognize the need and have the ability, to engage in continuous reflective learning in the context of technological advancement. Create, select, adapt and apply appropriate techniques, resources, and computing tools to complex computing activities. Able to learn, adapt and apply emerging tools and technologies to meet the demand.

Innovation, Employability and Entrepreneurial skills

Identify opportunity; pursue that opportunity to create value and wealth for the betterment of the individual and society at large. Develop the capacity to study and research independently that will help to develop skills for transition to employment in hardware/software companies.

THIAGARAJAR COLLEGE, MADURAI – 9. (Re-Accredited with 'A++' Grade by NAAC)

Department of Computer Application and Information Technology

Vision

The Department of Computer Application & Information Technology foster competent and confident student community, enriched with soft skills inculcated with managerial skills and moralvalues.

Mission

- Empower groomed software professionals with robust knowledgebase
- Achieve employability in Information Technology and non Information Technology sector
- Develop potentialindividuals
- Promote students to become a successful entrepreneur.

Programme Educational Objectives (PEO)

The objectives of this programme is to equip/prepare the students to

PEO1	Equip the students to meet corporate needs.
PEO2	Professionally educate the students for pursuing higher education.
PEO3	Nurture the students with skills required to become an entrepreneur.
PEO4	Adapt the students with better learning ability in the ever changing
	software industry.
PEO5	Manage cross culture environment and have peer recognition.

Programme specific outcomes: BCA

On the successful completion of BCA the students will

PSO1	Illustrate the key concepts in Computer Applications.
PSO2	Analyze latest technologies and apply them to solve the issues in Computer Applications.
PSO3	Clarity on both conceptual and application oriented skills in computer technologies with
	quantitative and qualitative techniques.
PSO4	Build technical, professional, practical and communicative skills to face the industrial with
	clarity.
PSO5	Develop practical skills to provide solutions for computer oriented problems.

THIAGARAJAR COLLEGE, MADURAI – 9. DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY BACHELOR OF COMPUTER APPLICATION(w.e.f. 2021 batch onwards)

Course	Code No.	Subjec t	Ho s	ur	Credi s	t Total M t of Hour Allott d	No. rs te	Ma Ma C	ıx. rks A	Ma Mai s S	x. ·k E	Tota l
Part I	U20P111C	Tamil		5	3	75		2	5	75	5	100
Part II	U20EN11	English for Comm.	I	4	3	60		2	5	75	5	100
Core 1	UCA20C11	Digital Principlesand Computer Organization	2	4	3	60		2	5	75	5	100
Core 2	UCA20C12	Programming inC	4	4	3	60		2	.5	75	5	100
Core Lab 1	UCA20CL11	Programming inC Lab		3	2	45		4	0	60)	100
Core Lab 2	UCA20CL12	Multimedia Lab		3	2	45		4	0	60)	100
Allied 1	UMA20GE 11I	Mathematical foundation for CS		5	5	75		2	5	75	5	100
AECC- I	U20ES11	Environment alStudies		2	2	30		15		35	5	50
Total			3	60	23	450		22	20	53	0	750
. <u> </u>		Semester	' – II									
Course	Code No	. Subject	Hour s	Cı	redit s	Total No.of Hours Allotted	Ma Ma S CA	ıx. rk A	Max Mar s SE	x. *k	T	otal
Part I	U20P121C	Tamil	5		3	75	25		-	75	1(00
Part II	U20EN21	English for Comm.II	4		3	60	25		-	75	1(00
Core 3	UCA20C21	Java Programming	4		3	60	25		-	75	1(00
Core 4	UCA20C22	Relational Database Management System	4		3	60	25			75	1(00
Core Lab 3	UCA20CL2	Java Programming Lab	Iava Programming Lab32		2	45	40		6	50	1(00
Core Lab 4	UCA20CL22	2 RDBMS Lab	3		2	45	40		(50	10	00
Allied II	UMA20GE21	I Probability and Statistics	5		5	75	25			75	1(00
VE	U20VE21	Value Education	2		1	30	15			35		50
TOTAL			30		23	450	22	20	5	30		750

Programme Code-UCA Semester – I

Thiagarajar College, Madurai. 41st ACM - Department of CA & IT - Syllabus 2020 L7

Course	Code No.	Subject	Hours	Credits	Total No. of Hours Allotted	Max. Marks CA	Max. Mark s SE	Total
Core 5	UCA20C31	Microprocessor and Assembly Language Programming	5	4	75	25	75	100
Core 6	UCA20C32	Data Structures	5	4	75	25	75	100
Core Lab5	UCA20CL31	Data Structures Lab Using Java	4	2	60	40	60	100
Core Lab6	UCA20CL32	Web Designing With PHP Lab	4	2	60	40	60	100
Core Elective I	UCA20CE31 (a/b/c/d)	Options given	5	5	75	25	75	100
Allied III	UMA20GE31I	Computational Methods	5	5	75	25	75	100
NME-I	UCA20 NE31	E-Waste Management	2	2	30	15	35	50
TOTAL			30	24	450	195	455	650

Semester –III

Semester - IV

Course	Code No.	Subject	Hours	Credits	Total No. of Hours Allotted	Max. Marks CA	Max. Marks SE	Total
Core 7	UCA20 C41	Software Engineering	4	4	60	25	75	100
Core 8	UCA20 C42	Mobile Application Development	5	4	75	25	75	100
Core 9	UCA20 C43	Operating System	5	4	75	25	75	100
Core Lab 7	UCA20 CL41	Mobile Application Development Lab	4	2	60	40	60	100
Core Elective II	UCA20CE41 (a/b/c/d)	Options given	5	5	75	40	60	100
Allied IV	UMA19GE41I	Operations Research	5	5	75	25	75	100
NME-II	UCA19 NE41	Cybercrime and IPR issues	2	2	30	15	35	50
TOTAL			30	26	450	210	490	700

Semester V

Course	Code No.	Subject	Hour s	Credit s	Total No. ofHours Allotted	Max. Mark sCA	Max. Mark sSE	Total
Core 10		Data	6	5	90	25	75	100
	UCA20C51	Communication						
		and Network Security						
Core 11		Python	6	5	90	25	75	100
	0CA20CJ2	Programming						
Core 12	UCA20C53	Cloud Computing	6	5	90	25	75	100
Core Lab 8		Python	4	2	60	40	60	100
	UCA20CL51	Programming Lab						
Project	UCA20PJ51	Project	6	3	90	25	75	100
SEC-I	UCA20SE51 (a/b/c/d/e/f)	Options given	2	2	30	15	35	50
TOTAL			30	22	450	155	395	550
	UCA20IN	Internship		2		15	35	50

Semester VI

Course	Code No	Subject	Hour s	Credits	Total Noof Hrs Allotted	Max Mark sCA	Max Mark sSE	Total
Core 13	UCA20C61	Data Mining	5	4	75	25	75	100
Core 14	UCA20C62	Big Data Analytics	5	4	75	25	75	100
Core 15	UCA20C63	.Net Programmin g	5	4	75	25	75	100
Core 16	UCA20C64	Internet of Things	5	3	75	25	75	100
Core Lab9	UCA20CL61	Data Analytics Lab	4	2	60	40	60	100
Core Lab10	UCA20CL62	. Net Programming Lab	4	2	75	40	60	100
SEC-II	UCA20SE61 (a/b/c/d/e/ f)	Options given	2	2	30	15	35	50
Part _V		Part _V		1				
TOTAL			30	22	450	195	455	650
ΤΟΤΑ	AL CREDITS FO to V	OR SEMESTERS I I		140				

Semester	Contact Hrs/ Week	Credits
Ι	30 hrs	23
II	30 hrs	23
III	30 hrs	24
IV	30 hrs	26
V	30 hrs	22
VI	30 hrs	22
Part – V	-	01
Total	180 hrs	140
V	Internship	2

A) Consolidation of contact hours and credits: BCA

B) Curriculum Credits: Part wise

		No of papers	Credits per	Total credits	
Part I	Tamil	2	<u> </u>	06	
Part II	English	2	3	06	
Part III	Core Theory	16	3⁄4	61	
	Core lab	10+ Project 1	2/3/4 - Project	25	
	Core Elective	2	5	10	
	Generic Elective Theory	4	5	20	
Part IV	AECC	2	2+1	3	
	NME	2	2	4	
	SEC	2	2	4	
	Part V (N	NSSNCC/Physica	al Education)	1	
Internship (Extra Credit) - IV Semester, 2 Viva : V Semester 2					
	Gi	rand total		140 +2	

Skill Based Electives

- a) R Programming Lab
- b) Problem Solving using C
- c) Machine Learning
- d) Cloud Lab
- e) Digital Image Processing
- f) Data Mining Lab (WEKA Tool)

Non Major Electives

- a) NME I E-Waste Management
- b) NMEII Cybercrime and (Intellectual Property Rights)IPR issues

Core Electives

- a) Web Designing With PHP
- b) Artificial Intelligence
- c) Ethics in Information Security
- d) Aptitude & Reasoning

<u>Certificate Course</u>

Software Testing

THIAGARAJAR COLLEGE, MADURAI- 9 An autonomous institution affiliated by Madurai kamaraj university (Re-Accredited with "A++" Grade by NAAC) DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

Course Code	Course Title		Category	L	Т	Р	Credit
UCA20C41	Software Engineering		Core7	4	-	-	4
	L - Lecture	T - Tutorial	P –	Practic	cals		

Year	Semester	Internal	External	Total
2	IV	25	75	100
Ducombl	a			

Preamble

Familiar with software engineering techniques and procedures and develop software projects by applying various software engineering concepts.

Course Outcomes

On the completion of the course the student will be able to

	Course Outcome	Expected	Expected
#		Proficiency	Attainment
CO1	Illustrate basic software engineering methods and practices, and their	82%	75%
	development process model.		
CO2	Discuss various software cost factor and cost estimation techniques.	76%	73%
CO3	Demonstrate the basic concepts of Software requirement specification	72%	68%
	and the basic concepts of design		
CO4	Make use of various software design techniques, Notations and	75%	73%
	software testing strategies.		
CO5	Discuss various software testing fundamentals and SCM Process.	78%	76%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	М	L	L
CO2	S	Μ	L	L	L
CO3	S	Μ	Μ	Μ	L
CO4	S	Μ	Μ	S	Μ
CO5	S	Μ	Μ	Μ	Μ

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	L	L	L
CO2	S	Μ	L	L	L	L
CO3	S	Μ	Μ	Μ	L	Μ
CO4	S	Μ	Μ	S	Μ	S
CO5	S	Μ	Μ	Μ	Μ	S

Blooms taxonomy

		CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

Content

Unit -1:

Introduction to Software Engineering: Introduction –Some definitions –Some size factors– Quality and productivity factors . Planning a Software Project: Introduction – Defining the problem-Developing a solution strategy – Planning the development process– Planning an organizational structure.

Unit -II:

Software Cost Estimation: Introduction – Software cost factors– Software cost estimation Techniques- Staffing level estimation -Estimating software maintenance costs.

Unit -III:

Software Requirements Definition: Introduction – The Software requirements specification – Formal specification techniques– Relational notations – State oriented notation Software Design: Introduction -Fundamental design concepts-Modules and modularizing criteria

Unit -IV:

Software Design: Design notations – Design techniques – Detailed design consideration-Software Testing Strategies: A Strategic approach to software testing-Strategic issues-Testing strategies for conventional software– Validation testing – System testing. Unit -V:

Testing Conventional Applications: Software testing fundamentals –Internal and External views of testing – White-box testing – Basis path testing – Control structure testing – Black-box testing. Software Configuration Management: Software configuration management – The SCM repository – The SCMprocess.

Unit	Chapters/Sections
Ι	Book1: 1(1.1-1.4), 2(2.1-2.4)
II	Book1: 3(3.1-3.4)
III	Book1: 4(4.1-4.2),5(5.1-5.2)
IV	Book1: 5(5.3-5.5) Book2: 17(17.1-17.3,17.6,17.7),
V	Book2: 18(18.1-18.6), 22(22.1-22.3)

12hours

12hours

12 hours

12hours

Text Books:

1.Richard.E.Fairely, 2014 Reprint, Software Engineering Concepts, Tata McGraw – Hill Education Private Limited, New Delhi.

2.Roger S.Pressman, 2015, Software Engineering A Practitioner's Approach, 7th edition, Tata McGraw – Hill Education Private Limited, New Delhi.

References:

- Ian Sommerville, 2015, Software Engineering, 9th edition, Pearson Indian Education Service Private Limited, Chennai.
- 2. Pankaj Jalote 2015, An Integrated Approach to Software Engineering, 3rd edition, Narosa Publishing House, New Delhi.
- 3. Aggarwal k.k,Yogeshsingh,2005, Software Engineering, 2nd edition, New age international Private Limited, Publishers,New Delhi.

Web Resources:

1. https://www.tutorialspoint.com/software_engineering/software_engineering_quick guide.htm

2. http://moodle.autolab.unipannon.hu/Mecha_tananyag/szoftverfejlesztesi_folyamatok_angol/ch13.ht ml

3.https://www.tutorialspoint.com/software_testing/software_testing_tutorial.pdf

Course Designers:

- 1. Mrs.M.B.C.Ashavani
- 2. Mrs. R. Umamaheswari

THIAGARAJAR COLLEGE, MADURAI- 9 An autonomous institution affiliated by Madurai kamaraj university (Re-Accredited with "A" Grade by NAAC) DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those join	ned BCA on or	after June 2020)
-----------------	---------------	------------------

Course Code	Course Title		Category	L	Т	Р	Credit
UCA20CE31/ UCA20CE41(d)	Aptitude & Reasonin	g	Core ElectiveII	5	-	-	5
	L - Lecture	T - Tutorial	P – P1	ractical	S		

YearSemesterInternalExternalTotal2IV2575100Preamble

Facilitates to solve various quantitative and aptitude problems, along with the verbal, non verbal reasoning and promotes in placement.

Course Outcomes

On the completion of the course the student will be able to

	Course Outcome	Expected	Expected
#		Proficiency	Attainment
COI	Recall and apply number system, HCF & LCM of Numbers, Averages , Percentage and problems on ages	76%	73%
CO2	Solve problems Ration & proportion,Time & Work , problems on trains and calendar	76%	73%
CO3	Find the solution of Simple Interest, Compound Interest, Data Interpretation: Tabulation, Bar Graphs, Pie Charts.	72%	68%
CO4	Discuss various Number series- Alpha numeric series- Analogy- coding and decoding techniques and blood relations concept	75%	73%
CO5	Explain the concept of Logic – Statements arguments – Statement assumption- Series : Series – 5 figure series - 3 and 4 figure series	78%	76%

Mapping of COs with PSOs					
	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	М	М
CO2	S	Μ	S	S	L
CO3	S	S	S	Μ	Μ
CO4	S	S	S	Μ	Μ
CO5	S	S	S	S	L
S-Strong	Ν	I- Medium	L-Low		

Mapping of COs with POs

DO1

	POI	PO2	POS	P04	POS	PUo	
CO1	S	L	L	S	S	L	
CO2	S	Μ	Μ	Μ	S	Μ	
CO3	S	М	L	S	S	Μ	
CO4	S	Μ	S	S	L	Μ	
CO5	S	S	S	S	L	S	
S-Strong	I	M- Medium	L-Low				

DO 4

DOF

DO

DO

Blooms taxonomy

		CA		
	First	Second		
Knowledge	40%	40%	40%	
Understand	40%	40%	40%	
Apply	20%	20%	20%	
Total marks	52	52	140	

DOA

Content

Unit I:

Number system, HCF & LCM of Numbers, Averages ,Problems on Ages, Percentage

Unit II:

Ratio and Proportion, Time & Work, Problems on Trains, Calendar

Unit III:

Simple Interest, Compound Interest, Data Interpretation: Tabulation, Bar Graphs, Pie Charts.

Unit IV:

Series: Series completion – Number series- Alpha numeric series- Analogy- Coding-Decoding : Letter coding-Direct letter coding - number/symbol coding - Bloodrelations .

Unit V:

Logic :Logic – Statements arguments – Statement assumption- Series :Series – 5 figure series -3 and 4 figure series

3

15 hours

15 hours

15 hours

15 hours

IV	Book 2-1,2,4(194-228),5
V	Book 2-Section II-1,2,3
	Part-II-1

Text Books:

Aggarwal R.S, 2016, Quantitative Aptitude For Competitive Examinations (Fully solved) AsPer New Examination Pattern 7th Revised edition, S. Chand & Company Pvt Ltd, New Delhi.

Aggarwal R.S, 2015, A Modern Approach To Verbal & Non Verbal Reasoning, S. Chand & Company Pvt.Ltd, New Delhi.

References:

- 1. Abhijit Guha, 2014, Quantitative Aptitude for Competitive Examinations, 5th edition, Tata McGraw Hill Publications, New Delhi.
- 2. Sijwali BS, Indu Sijwali, 2014, A New Approach to Reasoning Verbal & Non-Verbal Paperback , Arihant Publication

Web Resources:

- 1. www.careerbless.com
- 2. https://www.indiabix.com/aptitude/profit-and-loss/
- 3. https://www.handakafunda.com/pipes-and-cisterns-concepts-properties-and-cat-questions/

Course Designers:

- 1. Mrs. M.B.C.Ashavani
- 2. Mrs.UmaMaheswari

THIAGARAJAR COLLEGE, MADURAI- 9 An autonomous institution affiliated by Madurai kamaraj university (Re-Accredited with "A" Grade by NAAC) DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

CourseCo	ode	Course Title		Catego	ry L	Т	Р	Credit
UCA20C4	3	Operating System		Core9	4	1	-	4
		L-Lecture	T-Tutorial		P–Prac	tical		
Year	Semester		Int	ernal	Exter	nal	Total	

25

75

100

Preamble

Π

Provoking the knowledge on the basics of operating system with process, memory management, distributed processing and working with Files and Directories in unix.

Course Outcomes

IV

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Illustrate the basics of computer system, architecture and operating system Services and process scheduling	73%	70%
CO2	Explain the concept of scheduling criteria with scheduling algorithms, deadlocks and its recovery techniques	75%	70%
CO3	Discuss the background of memory management mechanisms with segmentation , paging and Demand paging	76%	73%
CO4	Describe file management with file organization, access, b-trees, file system Security and disk scheduling	70%	65%
CO5	Explain the concept of Files system, Directories and vi editor	68%	60%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	М	L
CO2	S	М	S	М	L
CO3	S	Μ	Μ	М	L
CO4	S	М	Μ	М	L
CO5	S	M		M	L
S-Strong	M- Me	dium	L-Low		

• Thiagarajar College, Madurai. - 40th ACM - Dept. of CA & IT - Syllabus 2020

Mapping of	COs with	POs
------------	-----------------	-----

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	L	L	L	L
CO2	S	S	L	S	S	Μ
CO3	S	M	L	S	S	S
CO4	S	S	L	L	S	S
CO5	Μ	L	S	L	Μ	S

Blooms taxonomy

		CA	End of Semester
	First	Second	
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content

Unit-I

Introduction: Computer-System Organization–Computer-System Architecture-Operating- System Structure- Operating-System Operations. Process Management- Kernel Data Structures - Computing Environments. System Structures: Operating-System Services-User and Operating- System Interface-System Calls- Types of System Calls-System Programs-Operating -System Design and Implementation- Operating-System Structure- Operating-System Debugging - Operating- System Generation-System Boot.

Unit–II:

Process Management: Process Concept- Process Scheduling – Operations on Processes– Inter Process Communication. Process Scheduling: Basic Concepts - Scheduling Criteria -Scheduling Algorithms. Deadlocks: System model – Deadlock Characterization – Methods for handling Deadlocks - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection-Recovery from Deadlock.

Unit–III

Memory Management: Background - Swapping - Contiguous Memory Allocation-Segmentation – Paging – Structure of the Page Table. Virtual Memory Management: Background - Demand Paging - Page Replacement.

Unit-IV

File Management: Overview: File Organization and Access- B-Trees- File Directories-File sharing-Record Blocking - Secondary storage Management. Disk Scheduling: Disk Performance Parameters-Disk Scheduling Polices.

15hours

15hours

15hours

Unit – V

File System: The parent child relationship, the HOME variable, pwd, cd, mkdir, absolute pathname, relative pathname. Basic file attributes: ls: listing directory contents, the UNIX file system, ls –l, -d option, file ownership, file permissions, chmod, directory permissions, changing file ownership. Vi editor: Basics, input mode, saving text and quitting, searching for a pattern (| and ?), substitution- search and replace(:s).

Unit	Chapters/ Section
Ι	Book 1: 1(1.2-1.5,1.10,1.11),2
II	Book 1: 3(3.1-3.4),5(5.1-5.3), 7
III	Book 1: 8(8.1-8.6), 9(9.1,9.2,9.4)
IV	Book 2: 12(Pg. no. 455-462) ,11(Pg.no.491-523)
	Book2: 13(Pg. no. 577-604),14(Pg. no. 609-632),
	15(Pg. no. 649- 670)
V	Book 3: 4(Pg. no. 64-80),6(106-117),7(120-141)

Text Books:

- 1. Abraham Silberschatz, Peter B Galvin, Gerg Gagne, 2016, Operating System Concepts, 9thedition, Wiley India Pvt . Ltd., New Delhi.
- 2. William Stallings, 2016, Operating Systems Internals and Design principles, 7th edition,Pearson Education Inc, Noida.
- 3. Unix concepts and applications, TMH, Sumitabha Das

References:

- 1. Stuart E.Madnick.John J.Donovan, 2016(Reprint), Operating Systems, Tata McGraw HillEducation, New Delhi.
- 2. Andrew S. Tanenbaum, 2015, Modern Operating Systems, 4thedition, Pearson Education.
- 3. Charles Crowlay, 2008, Operating System, A Design-Oriented Approach, Tata McGraw HillEducation, New Delhi

Web

Resources:

1.https://www.tutorialspoint.com/operating_system/os_process_scheduling.htm 2.http://www.technologyuk.net/computing/operating-systems/processmanagement.shtml 3.https://web.cs.wpi.edu/~cs3013/c07/lectures/Section08-Memory_Management.pdf

4.https://www.tutorialspoint.com/operating_system/os_file_system.htm

Course Designers:

- 1. Mrs. M.B.C.Ashavani
- 2. Dr. V.T. Meenatchi

Ξ

THIAGARAJAR COLLEGE, MADURAI- 9 An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

Course Code		Course Ti	tle		Categ	ory	L	Т	Р	Credit
UCA20	UCA20C51 Data Communication and Network Security				Core	10	5	1	-	5
		L - Lecture	T - Tutoria	.1		P –	Practic	cals		
Year		Semester		In	nternal External		al	Tota	1	
III		V			25	75			100	

Preamble

To understand the components of data communication, OSI model, various protocols in TCP / IP suite, the transmission media and mode, various issues in network security.

Course O	utcomes		
		Expected	Expected
#	Course	Proficiency	Attainment
	Outcome		
CO	Discuss the basics of data communication components, network	78%	75%
1	types, Internethistory, the OSI model and TCP / IP protocol suite		
СО	Illustrate physical layer, its data and signals, transmission	70%	68%
2	impairment, transmission media and the concepts of switching		
СО	Describe the data link laver. error detection correction mechanisms,	74%	70%
3	the DLCservices, the data link layer protocols and media access control(MAC)		
CO	Examine network layer services, network layer protocols, the routing	75%	75%
4	Algorithms and transport layer protocols.		
CO	Survey standard client server protocols, electronic mail, TELNET,	70%	65%
5	secure snell(SSH), cryptography, network security and firewalls.		

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	S	Μ	S	Μ	L
CO3	S	S	Μ	S	S
CO4	S	S	M	S	S
CO5	S	L	S	L	L

Mapping of COs with POsPO1PO2PO3CO1SSCO2SM

COI	3	3	3	IVI	L	IVI
CO2	S	Μ	S	Μ	L	L
CO3	S	S	S	Μ	L	L
CO4	S	S	S	Μ	L	М
CO5	S	S	S	Μ	L	S

Blooms taxonomy

PO6

NЛ

PO5

PO4

NÆ

	•		Ella ol
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

CA

Content

Unit-I:

Introduction: Data Communications - Components – Data Representation – Data Flow- Networks – Network Types – Internet History. Network Models: Protocol Layering – TCP/IP Protocol Suite – The OSI Model

End of

Unit-II:

Physical Layer: Data and Signals – Periodic Analog Signals – Digital Signals - Transmission Impairment – Data Rate Limits – Performance. Transmission Media: Introduction - Guided Media – Unguided Media:Wireless. Switching: Introduction – Circuit Switched Networks – Packet Switching

Unit-III:

Data Link Layer: Introduction – Link layer Addressing. Error Detection and Correction: Introduction –Cyclic Codes:Cyclic Redundancy check-Polynomials. Data Link Control(DLC): DLC Services – Data Link Layer protocols –Media Access Control(MAC): Random Access.

Unit-IV:

Network Layer: Network Layer Services – Network Layer Performance – IPV4 Addresses. Network Layer Protocols: Internet Protocol(IP) – ICMPv4 – Mobile IP. Unicast Routing: Introduction – Routing Algorithms. Transport Layer: Introduction – TransportLayer Protocols: Simple Protocol, Stop and Wait Protocol.

Unit-V:

Application Layer: Introduction. Standard Client Server protocols: World Wide Web and HTTP – FTP – Electronic Mail – TELNET – Secure Shell (SSH) – Domain Name System (DNS). Cryptography and Network Security: Introduction-Confidentiality-Other aspects of security- Internet Security: Network Layer Security – Transport Layer Security – Application Layer Security – Firewalls.

15 hours

17 hours

14 hours

14 hours

Unit	Chapters/ Section
Ι	1(1.1-1.4), 2(2.1-2.3)
II	3(3.1-3.6), 7(7.1-7.3), 8(8.1-8.3)
III	9(9.1-9.2), 10(10.1,10.3(10.3.1,10.3.2), 11(11.1-11.2), 12(12.1)
IV	18(18.1,18.3,18.4), 19(19.1-19.3),20(20.1,20.2), 23(23.1,23.2(23.2.1,23.2.2))
V	25(25.1), 26(26.1-26.6), 31(31.1-31.3), 32(32.1-32.4)

Text Books:

1. Behrouz A. Forouzan, 2013, Data Communications and Networking , 5th edition, McGraw – Hill Education Private Limited, New Delhi

References:

- Achyut S Godbole, Atul Kahate, 2014(6th Reprint), Data Communications and Networks, McGraw – Hill Education Private Limited, New Delhi
- 2. Tannenbaum, 2011, Computer Networks, 5th edition, Pearson Education Inc., USA
- 3. Sarma C.R, 2006, Computer Networks, A Pragmatic Approach. Jaico Publishing house, NewDelhi

Web Resources:

1. http://www.studytonight.com/computer-networks/complete-osi-model

2. https://www.cse.iitk.ac.in/users/dheeraj/cs425/lec01.html

3.https://www.tutorialride.com/computer-network/application-layer-protocols-in-computer-network.htm

Course Designers:

1.Dr. V. T. Meenatchi 2.Mrs.R.Umamaheswari

Ξ

THIAGARAJAR COLLEGE, MADURAI-9

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

	(For those joined BCA on or after June 2020)								
Cours	se	Course Title		Catego	ory L	Т	P	Credit	
Code	e								
UCA20	C52	Python Programmir	ıg	Core 1	1 5	1	-	5	
		L - Lecture	Γ - Tutorial		P – Practic	cals			
Year		Semester	I	nternal	Externa	al	Tota	1	
III		V		25	75		100		

Preamble

Facilitates to learn the programming concepts of python using various controls.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Discuss about the way of the program using variables, expressions, statements and functions with conditionals and recursion.	76%	71%
CO2	Explain iteration, strings, lists with traversal, operations, methods and dictionaries	74%	72%
CO3	Describe tuples, dictionaries, sequences of sequences and files, catching exceptions, Databases, pickling, pipes and writing modules.	70%	64%
CO4	Illustrate MySQL integration with Python, connecting database with python and apply select and CRUD operations.	64%	60%
CO5	Apply Django framework, Installation setup on windows, Git, Text editor,Bitbucket.	65%	60%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	Μ
CO2	S	Μ	Μ	S	Μ
CO3	S	М	Μ	S	Μ
CO4	S	Μ	Μ	Μ	L
CO5	S	Μ	Μ	Μ	L

S-Strong

M- Medium L-Low

Mapping with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	
CO1	S	S	М	Μ	S	Μ	
CO2	S	Μ	S	Μ	S	Μ	
CO3	S	S	Μ	Μ	Μ	S	
CO4	S	S	Μ	Μ	S	S	
CO5	S	S	S	Μ	Μ	S	

DO4

DO5

DO3

Blooms taxonomy

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

DO1

Content

Unit-I:

The way of the program- Variables, expressions and statements-Functions-Case study: interface design: Turtle World -Simple repetition- Exercises- Encapsulation - Generalization- Interface design- Refactoring - A development plan - docstring -Conditionals and recursion.

Unit-II:

Fruitful functions – Iteration-Strings-Lists: A list is a sequence -Lists are mutable- Traversing a list - List operations - List Methods-List arguments-Dictionaries: Dictionary as a set of counters - Looping and dictionaries-Global Variable.

Unit-III:

Tuples: Tuples are immutable - Tuple assignment - Tuples as return values- Variable-length argument tuples - Lists and tuples - Dictionaries and tuples - Comparing tuples - Sequences of sequences. Files: Persistence- Reading and writing -Format operator- Filenames and paths-Catching exceptions -Databases-Pickling -Pipes-Writing modules.

Unit-IV:

Getting Up and Running with MySQL for Python: - Getting MySQL for Python - Importing MySQL for Python- MySQLdb- Connecting with a database- Multiple database connections -Simple Querying:- A brief introduction to CRUD - Forming a query in MySQL- Passing a query to MySQL- A simple SELECT statement- Simple Insertion: Forming an insertion

statement in MySQL Passing an insertion to MySQL.

Unit-V:

Introduction- Initial Set Up: The Command Line-Install Python3 on Windows-Virtual Environment-Install Django-Install Git-Text Editors-Hello World App: Initial Setup-Create an App-Views and URLConfs- Hello World-Git-Bit Bucket-Pages App:-Initial Setup-Templates-Class based Views-URLs-Add and About Page-Tests-Git and Bitbucket

15 hours

15 hours

20 hours

20 hours

UNIT	Chapter /Sections
I	Book1:1,2,3,4,5
II	Book1:6,7,8,10
III	Book1:12,14
IV	Book2:1,2,3
V	Book3:1,2,3

Text Books:

1. Allen Downey, 2017, Think Python, Green Tea Press.

2. Albert Lukaszewski, 2010, MYSQL for Python, Packt Publishing.

3. William S. Vincent, 2018, DJANGO for Beginners Build websites with Python and Django.

References:

1. Paul Deitel and Harvey Deitel, Python for Programmers, Pearson Education, First Edition 2021.

2. G. Venkatesh and Mathavan Mukund , Computational Thinking: A Primer for Programmers and Data Scientist, First Edition, Notion Press, 2021.

3. Martin C Brown , Python – The Complete reference, Fourth Edition , Tata McGraw Hill, 2018.

Web Resources:

 $1.https://www.tutorialspoint.com/python/python_tuples.htm$

2.https://www.learnpython.org/en/Classes_and_Objects

1.http://openbookproject.net/thinkcs/python/english3e/fruitful_functions.html

Course Designers:

- 1. Dr. S. Abirami
- 2. Dr. V.T Meenatchi

Ξ

THIAGARAJAR COLLEGE, MADURAI-9

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Cours Code	se e	Course	Title		Category	L	T	Р	Credit
UCA20	20C53 Cloud Computing				Core 12	5	1	-	5
		L - Lecture	T - Tutoria	al	P – Practi	cals			
Year		Semester		Interna	l Extern	al	Т	otal	
III		V		25	75		1	.00	

Preamble

To introduce the broad perceptive of cloud architecture, understand the concept of virtualization, design of cloud Services and be familiar with the lead players in cloud.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Explore the core concepts of the cloud computing paradigm	76%	71%
CO2	Understand the Cloud Services and Platforms	74%	72%
CO3	Analyze the cloud storage platform	70%	64%
CO4	Explore the concept of Software as service model	74%	70%
CO5	Illustrate the Cloud Applications for Industry, Healthcare and Education	60%	60%

Mapping of Course Outcome with Programme Specific Outcomes

Thiagarajar College, Madu Pos O 11st ACM - Bes O 2 CA & IT - BS O 3 S 2020 PSO4

PSO5

CO1	S	S	S	S	Μ
CO2	S	S	S	S	Μ
CO3	S	S	Μ	S	Μ
CO4	S	S	Μ	S	L
CO5	S	L	L	Μ	L

Strong – S Medium-M Low-L

-

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
C01	S	S	L	Μ	S	S
CO2	S	S	L	Μ	Μ	S
CO3	S	Μ	L	Μ	Μ	S
CO4	S	Μ	L	L	Μ	S
CO5	S	L	L	L	L	Μ

Blooms taxonomy: Assessment Pattern

	(CA	End of	
	First	Second	Semester	
Knowledge	40%	40%	40%	
Understand	40%	40%	40%	
Apply	20%	20%	20%	

Course Content - Cloud Computing

Unit-I

Unit-III

Unit-IV

Unit-V

Cloud Computing Basics: Cloud Computing Overview-Applications-Intranets and the Cloud-First Movers in the Cloud. Your Organization and Cloud: When you can use Cloud Computing-Benefits-Limitations-Security Concerns- Regularity Issues.

Unit-II 18hours The Business case for going to the cloud-Cloud computing Services. How those Services Helping your Business. Hardware and Infrastructure: Clients-Security- Network-Services

Accessing the Cloud : Platforms – Web Applications- Web APIs. Cloud Storage: Over view- Cloud Storage Providers.

Software as a service: Overview- Driving Forces—Industries. Developing for Cloud: Cloud Application Design- Reference Architecture for Cloud Applications- Cloud Application Design Methodologies.

Cloud for Industry, Healthcare and Education: Cloud Computing for Healthcare- Cloud Computing for Energy Systems- Cloud Computing for Transport Systems- Cloud Computing for Manufacturing Industry- Cloud Computing for Education.

18hours

18hours

18hours
Unit	Chapters / Sections
Ι	Book1 : 1, 2
II	Book1: 4 (Pg. 69-80), 5
III	Book1: 6 (Pg. 111- 122), 7
IV	Book1 : 9 (Pg. 173-177, 184-190), Book2: 5(5.1-5.4)
V	Book2: 13(13.1-13.5)

Text Books

1. Anthony, T. Velte Toby, J.Velte, Ph.D. Robert Elsenpeter, Cloud Computing: A Practical Approach, The McGraw-Hill, 2017 (Reprint)

2. Arshdeep Bahga and Vijay Madisetti," Cloud Computing: A Hands on Approach", University Press, Hyderabad, 2019(Reprint)

Reference Books

- 1. Shailendra Singh, "Cloud Computing: Focuses on the Latest Developments in Cloud Computing", Oxford University Press, 2018.
- 2. Dr. Anand Nayyar, "Handbook of Cloud Computing", Bpb Publications-2019
- 3. Surbhi Rastogi, "Cloud Computing Simplified", Bpb Publications, 2021

Web Resources

- 1. https://nptel.ac.in/courses/106/105/106105167/
- 2. https://www.tutorialspoint.com/cloud_computing/index.html
- 3. https://www.guru99.com/cloud-computing-for-beginners.html
- 4. https://www.youtube.com/watch?v=LICA-ILkO4w/

Course Designers

- 1. Dr. S.Abirami
- 2. Mrs. R.Umamaheswari

-

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

Course Code		Course Tit	tle	Category		L	Т	Р	Credit
UCA20CL51		Python Programn	ning Lab	Core Lab 8 - ·		-	4	2	
	L - Lecture T - Tutorial P – Practicals								
Year	Semester		Internal	al External		ıl	Tota	1	
III		V		40	60			100	

Preamble

Provides ability to know the basic control structures and commands with various data structures in python

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Generate python programs using control structures	75%	72%
CO2	Implement programs using exception handling and regular expressions	73%	68%
CO3	Apply file concepts in python programming	74%	72%
CO4	Create Database using MySql in Django Framework	77%	76%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Μ	L	L	Μ	S
CO2	M	Μ	Μ	S	S
CO3	L	Μ	Μ	S	S
CO4	Μ	Μ	L	S	S

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	S	М	L	М
CO2	S	S	S	М	L	S
CO3	S	S	S	Μ	L	S
CO4	S	S	S	Μ	S	М

S-Strong

M- Medium

Content

Simple Programs

- 1. Write a Python program which accepts the radius of a circle from the user and compute the area.
- 2. Write a Python program which accepts the user's first and last name and print them in reverse order with a space between them.
- 3. Write a Python program to display the first and last colors from the following list color_list = ["Red","Green","White","Black"]
- 4. Write a Python program that accepts an integer (n) and computes the value of n+nn+nnn.
- 5. Write a Python program to calculate number of days between two dates.
- 6. Write a Python program to get the volume of a sphere with radius 6.
- 7. Write a Python program to test whether a number is within 100 of 1000 or 2000
- 8. Write a Python program to calculate the sum of three given numbers, if the values are equal then return thrice of their sum

Control Structures

- 1. Create a Python program to print alphabet pattern 'A'.
- 2. Program for printing list of multiplication tables.

Files, Exception and Expressions

- 1. Program to demonstrate exception handling.
- 2. Program to demonstrate the use of regular expressions.

Functions

- 1. Write a Python function that takes a list of words and returns the length of the longest one.
- 2. Write a Python program to remove the nth index character from a nonempty string
- 3. Write a Python program to change a given string to a new string where the first and last chars have been exchanged.
- 4. Write a Python program to remove the characters which have odd index values of a given string.
- 5. Write a Python program to count the occurrences of each word in a given sentence.
- 6. Write a Python script that takes input from the user and displays that input back in upper and lower cases

Files

- 1. Write a Python program to read an entire text file.
- 2. Write a Python program to read first n lines of a file.
- 3. Write a Python program to append text to a file and display the text
- 4. Write a Python program to read last n lines of a file.
- 5. Write a Python program to read a file line by line and store it into a list.
- 6. Write a Python program to read a file line by line store it into a variable
- 7. Write a Python program to read a file line by line store it into an array.
- 8. Write a python program to find the longest words.
- 9. Write a Python program to count the number of lines in a text file.

Database Connectivity

- 1. Program to MySql and python integration.
- 2. Program to retrieve information from database through Django framework

Web Resources:

1.https://www.djangoproject.com

2.http://khitguntur.ac.in/csemat/PYTHON%20LAB%20MANUAL.pdf

3.https://youtube.be/rHuxx0gMZ3Eg

Course Designers:

- 1. Dr. V.T Meenatchi
- 2. Mrs.M.B.C.Ashavani

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

	× J			,		
Course Code	Course Title	Category	L	Т	Р	Credit
UCA20C61	Data Mining	Core-13	4	1	-	4
		Р-				

L - Lecture T - Tutorial Practicals

Year	Semester	Max.	Max.	Total
		Marks CA	Marks SE	
III	VI	25	75	100

Preamble

This course provides the basic concepts, principles, methods, implementation techniques and applications of data mining.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Identify the functionalities of Data Mining and various techniques to extract knowledge.	76%	71%
CO2	Analyze the methods to discover Association Rules.	74%	72%
CO3	Design & deploy the appropriate Clustering techniques.	70%	64%
CO4	Outline web mining, temporal and spatial data mining.	64%	60%
CO5	Examine and Explore weka techniques	65%	60%

Mapping with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	М	S	Μ
CO2	S	Μ	S	М	S	Μ
CO3	S	S	Μ	Μ	Μ	S
CO4	S	S	Μ	М	S	S
CO5	S	S	S	Μ	Μ	S

Mapping with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	S	Μ	Μ
CO2	S	S	S	Μ	Μ
CO3	Μ	Μ	S	S	S
CO4	S	Μ	S	Μ	L
CO5	S	S	S	Μ	L

(S – Strong, M – Medium, L – Low)

Blooms Taxonomy

	(CA	End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Content:

UNIT I : INTRODUCTION

What is Data Mining? Data Mining: Definitions, KDD vs Data Mining, Stages of KDD, DBMS vs DM, Other Related Areas, DM Techniques, Other Mining Problems, Issues and Challenges in DM, DM Application areas.

UNIT II : ASSOCIATION RULES

What is an Association Rule?, Methods to discover Association Rules, A Priori Algorithm, Partition Algorithm, Pincer Search Algorithm, FP-tree Growth Algorithm, Discussion on different algorithms, Generalized Association Rule.

UNIT III : CLUSTERING TECHNIQUES

Clustering paradigms, Partitioning Algorithms, k-Medoid Algorithms, CLARA, CLARANS, Hierarchical Clustering, DBSCAN.

UNIT IV :WEB MINING, TEMPORAL AND SPATIAL DATA MINING

Web Mining, Web Content Mining, Web Structure Mining, Web Usage Mining, Text Mining. What is Temporal Data Mining?, Temporal Association Rules, Sequence Mining, The GSP Algorithm, SPIRIT, Spatial Mining, Spatial Mining Tasks, Spatial Clustering, Spatial Trends.

UNIT V: Decision Trees

15 hours

15 hours

15 hours

15 hours

L42

15 hours

Introduction-What is a Decision Tree- Tree construction Principle-Best Split- Spilling indices-Splitting Criteria- Decision Tree Construction Algorithms-ID3.

Text Books:

1. Arun K Pujari, "Data mining Techniques", Fourth Edition, Universities Press (India) Private Limited, 2017.

Units	Chapters
Ι	2 (2.11 – 2.3, 2.8, 2.22, 2.23, 2.26,), 3(3.1 – 3.10)
Π	4(4.1-4.8, 4.11, 4.14)
III	5(5.1-5.8)

IV	11(11.1, 11.6) 12(12.1-12.5, 12,7, 12.12, 12.13, 12.15, 12.16)
V	6(61-67 69)
•	

References:

1. Jiawei Han, Micheline Kamber, Jian Pei, "Data mining Concepts and Techniques", Third Edition, Morgan Kaufman Publishers, 2012.

2.BERSON, ALEX & SMITH, STEPHEN J : 2012. —Data Warehousing, Data Mining, and OLAPI, TMH Pub. Co. Ltd, New Delhi.

Web Resources:

- 1. <u>www.tutorialspoint.com/data_mining</u>
- 2. http://meri.edu.in/meri/wp-content/uploads/2017/01/Mooc-on-Weka.pdf

Course Designers:

1.Mrs. R.Umamaheswari

2.Dr. V.T. Meenatchi

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Course Code		Course Title			Catego	ry	L	Т	P	Credit
UCA20C62		Big Data Analytics			Core1	4	4	1	-	4
		L-Lecture	T-Tutoria	1		P–	Practic	al		
Year	Semester		In	ternal	Ε	xterna	ıl	Tota	1	
III	VI				25		75		100	

Preamble

Introduce basic concepts and principles of big data, the technologies involved and discuss the concepts of NoSQL database.

Course Outcomes

On the completion of the course the student will be able to

		Expected	Expected
#	Course Outcome	Proficiency	Attainment
CO1	Discuss the types of digital Data, their	75%	70%
	characteristics, know the evolution of		
	Big data.		
CO2		75%	72%
	Introduce data analytics and the concept of		
	NoSQL and Hadoop.		
CO3	Understand the concept of MongoDB	75%	70%
CO4	Explain the Features of Cassandra with	68%	66%
	CRUD operations		
CO5	Discuss MapReduce Programming with	70%	60%
	Mapper, Reducer, Combiner and		
	Practitioner.		

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	Μ	S	Μ
CO2	S	S	S	Μ	S	Μ
CO3	S	S	Μ	Μ	Μ	S
CO4	S	S	Μ	Μ	S	S
CO5	S	S	Μ	Μ	Μ	S

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	Μ	Μ	L
CO2	S	S	Μ	Μ	S
CO3	S	S	S	Μ	Μ
CO4	S	S	Μ	Μ	S
CO5	S	S	Μ	Μ	S

(S-Strong, M-Medium, L-Low)

Blooms taxonomy

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content Unit I:

Types of Digital Data: Classification of Digital Data- **Introduction to Big Data** Characteristics of Data–Evolution of Big Data–Definition of BigData–Challenges of with BigData–What is BigData?– Other Characteristics of Data Which are not Definitional Traits of BigData Why BigData? Are We Just an Information Consumer or Do Weal so Produce information? Traditional Business Intelligence(BI) versus BigData– A typical Data Warehouse Environment – A Typical Hadoop Environment – What is New Today – What is Changing in the Realms of BigData?

Big Data Analytics: Where do we Begin? – What is Big Data Analytics? – What Big Data Analytics isn't? – Why this sudden Hype Around Big Data Analytics? – Classification of Analytics–Greatest Challenges that Prevent Businesses from capitalizing on BigData – Top Challenges Facing Big Data – Why is Big Data Analytics Important? – What kind of Technologies are we looking toward to help meet the challenges posed by Big Data? – Data Science –Data Scientists ...Your New Best Friend- Terminologies used in Big Data Environment – Basically Available Soft State Eventual Consistency (BASE)–Few Top Analytics Tools– The Big Data Technology Landscape – NoSQL(Not OnlySQL)

Unit III:

Introduction to Hadoop: Introducing Hadoop – Why Hadoop – Why Hadoop? – Why not RDBMS? – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop – Hadoop Distributors – HDFS (Hadoop Distributed File System) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN(Yet Another Resource Negotiator) –Interacting with Hadoop Ecosystem.

Unit IV:

Introduction to MongoDB: What is MongoDB? –Why MongoDB? – Terms Used in RDBMS and MongoDb- Data Types in MongoDB- MongoDB Query Language: Insert Method Save Method, Adding, Removing, Finding new documents- Dealing NULL values-Count,Limit, Sort and Skip-Arrays-Aggregate functions – MapReduce function -Introduction to Cassandra: Apache Cassandra – An Introduction – Features of Cassandra–CQLData type – CQLSH – Key spaces – CRUD (Create, Read, Update, Delete) operations – Collections –Using Counter-Time To Live (TTL) –Alter Commands –Import and Export.

15hours

15hours

15 hours

Unit V:

Introduction to MAPREDUCE Programming: Introduction – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.

Text Book:

1. "BigData and Analytics", Seema Acharya, Subhashini Chellappan,2015,Wiley India Pvt.Ltd., Ansari Road, Daryaganj, NewDelhi.

Unit	Chapters(pages)
1	1(1.1.1, 1.1.2, 1.1.3)2 (2.1 to 2.13)
2	3(3.1to 3.14)4 (4.1)
3	4(4.2)5(5.1 to5.13)
4	6(6.1-6.4, 6.5(6.56.5.10)),7 (7.1to 7.11)
5	8(8.1 to 8.8)

Reference Books

- 1. "BigData Work: Dispelling the Myths, Uncovering the Opportunities "Thomas H. Davenport,2014,Havard Business Review Press
- 2. "BigData in Practice" by Bernard Marr,2016, John Wiley & Sons
- 3. "Big Data: Principles and Best Practices of Scalable Real time ..." by James Warren and Nathan Marz , 2015, Manning Publications.

Web Resources:

- 1. https://www.edureka.co/blog/big-data-tutorial/
- 2. https://intellipaat.com/blog/big-data-tutorial-for-beginners/
- 3. https://www.edureka.co/blog/big-data-tutorial/
- 4. https://www.javatpoint.com/what-is-big-data/
- $5. \ https://www.tutorialspoint.com/big_data_tutorials.htm$

Course Designers:

- 1. Dr.V.T.Meenatchi
- 2. Mrs.R.Umamaheswari

15 hours

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

CourseCourse TitleCode		Categ	ory L	Т	P	Credit
UCA20C63	. Net Programming	Core	15 4	1	-	4
L - Lecture T - Tuto Practicals		itorial s	P –			
Year	Semester	Internal	Extern	al	Tota	l
3	VI		75		100	

Preamble

Inculcates the knowledge in .Net framework through application creation and experiment with ADO.Net and ASP.Net

Course Outcomes

On the completion of the course the student will be able to

		Expected	Expected
#	Course	Proficiency	Attainment
	Outcome		
CO1	Discuss the introduction to .Net framework, creating a windows	78%	75%
	forms application, arrays, the conditional and looping statement		
	with procedures and built in functions.		
CO2	Make Use of dialog boxes, error handling, classes and objects,	76%	74%
	overloading, overriding, constructors and destructors.		
CO3	Apply controls, delegates, system, windows and forms, control,	74%	66%
	properties and methods.		
CO4	Experiment with ADO .NET, data access in visual studio	75%	75%
	.NET: visual studio .Net database tools.		
CO5	Describe the introduction to ASP .NET, XHTML, browser sniffing,	76%	68%
	server controls versus web controls.		

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	Μ	L	Μ
CO2	S	L	L	Μ	S
CO3	S	Μ	Μ	S	S
CO4	S	L	Μ	S	S
CO5	S	Μ	Μ	S	S

Strong – S Medium-M Low-L

Mapping of	COs with POs	5				
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	Μ	Μ	L	S	L
CO2	S	Μ	S	L	S	L
CO3	S	S	Μ	Μ	S	Μ
CO4	S	S	S	Μ	S	S
CO5	S	S	S	Μ	S	S

S-Strong M- Medium L-Low

Blooms taxonomy

	(CA	End
	First	Secon	of
		d	Semes
			ter
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

Content

Unit –I:

Introduction to .Net:.Net Defined-The.Net Framework-VB .Net-Hello World: Creating a windows Forms application- Creating a Web Forms application. Data types, variables and operators: Data Types-and variables-Type Conversion-Structures-Numeric Parsing-System. String Class- Operators. Arrays: Introducing Arrays-Multi dimensional Arrays-Dynamic Arrays-The Array Class Members.

Unit –II:

Conditional Logic: The if then else Statement-The select case Statement-do..loop Statement-While..end while Statement-For...next Statement-For each...next Statement-A Complete example. Procedures: Procedures Overview-types of procedures-built in functions. Dialog Boxes: Introduction to dialog boxes-The Message box class-common dialog class.

Unit-III:

Controls: Delegates-System. windows. forms. control-Properties-Methods. Specific controls: Base Controls-Derived controls-Display controls.

Unit-IV:

ADO .NET: Accessing ADO.NET Features and namespaces-Using ADO.NET-Data Access in Visual Studio .NET: Visual studio .Net Database tools-Visual Studio .NET and ADO .NET.

16 hours

15 hours

13 hours

15 hours

16 hours

Introduction to ASP.NET- Why Asp.NET? .Html Server controls: XHTML –Compliant Code-Common Tag Attributes-Over view of Html Server Controls-Descriptions of the HTML server Controls and How to Program Them. Web controls: Browser Sniffing-Html Server Controls versus Web Controls-Web Controls and How to Program for them.

UNIT	Chapter /Sections
Ι	1,4,5,6
II	7,8,9
III	26,27(Pg. 583-641)
IV	22,23
V	32,34,35

Text Books:

Unit-V:

Bill Evjen, Jason Beres, 2014, VB . NET Programming Bible, Wiley publication.

References:

1. Matthew MacDonald, 2013(Reprint), The Complete Reference ASP.NET,McGraw Hill Education Private Limited,New Delhi.

2. Mary Delamater and Anne Boehm, 2013, Murach"s ASP.NET 4.5 Web Programming with C#.

3. Jason Beres, 2003, Sams Teach Yourself Visual Studio .NET 2003 in 21 Days.

Web Resources:

1.https://www.c-sharpcorner.com/article/dialog-boxes-in-c-sharp/

2.https://www.tutorialspoint.com/asp.net/asp.net_ado_net.htm

2.https://www.codeguru.com/csharp/.net/net_debugging/best-exception-handling-techniques-in-

.net.html

- Course Designers:
 - 1. Mrs.M.B.C.Ashavani
 - 2. 2. Dr. S.Abirami `

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Course Code	Course Title	Ca	ategory 1	LT	Р	Credit
UCA20C64	Internet of Things	C	ore 16	3 2		3
	L - Lecture T - Tutori	al	P – Practical	S		
Year	Semester	Internal	External		To	tal

25

75

Preamble

III

Enable to understand the fundamentals of Internet of Things, build a small low cost embedded system using Raspberry Pi and apply the concept of Internet of Things in the real world scenario.

Course Outcomes

On the completion of the course the student will be able to

VI

#	Course	Expected Proficiency	Expected Attainment
CO1	Interpret the Basic concepts of IoT	75%	70%
CO2	Analyze the domain specific IoTs	70%	68%
CO3	Understand Iot and M2M - M2M – Difference between IoT and M2M-SDN and NFV for IoT, IoT Design Methodology	70%	60%
CO4	Demonstrate the Programming Raspberry Pi with Python	70%	65%
CO5	Analyze Case Studies Illustrating IoT Design	70%	70%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S
CO2	S	Μ	S	Μ	L
CO3	S	S	Μ	S	S
CO4	S	S	M	S	S
CO5	S	L	S	L	L

Strong – S Medium-M Low-L

100

	PO1	PO2	PO3	PO4	PO5	PO 6
CO1	S	S	L	Μ	S	S
CO2	S	S	L	Μ	Μ	Μ
CO3	S	Μ	L	Μ	Μ	S
CO4	S	Μ	L	L	Μ	L
CO5	S	Μ	L	L	L	L
		Blooms toxo	nomy. Accord	mont Pottorn		

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content - Fundamentals of Internet of Things

Unit-I

Introduction to Internet of Things: Introduction: Definition & Characteristics of IoT. Physical Design of IoT: Things in IoT- IoT Protocols- Logical Design of IoT: IoT Functional Blocks-IoT Communication Models-IoT Communication APIs. IoT Enabling Technologies: Wireless Sensor Networks-Cloud Computing-Big Data Analytics-Communication Protocols-Embedded Systems. IoT Levels & Deployment Templates-IoT Level-1- IoT Level-2- IoT Level-3- IoT Level-4- IoT Level-5-IoT Level-6.

Unit-II

Domain Specific IoTs-Introduction: Home Automation: Smart Lighting-Smart Applications-Intrusion Detection-Smoke/Gas Detectors. Cities: Smart Parking-Smart Lighting-Smart Roads-Structural Health Monitoring-Surveillance-Emergency Response. Environment: Weather Monitoring - Air Pollution Monitoring-Noise Pollution Monitoring- Forest Fire Detection-River Floods Detection. Energy: Smart Grids-Renewable Energy System-Prognostics-Retail: Inventory Management- Smart Payments-Smart Vending Machines-Logistics-Agriculture-Industry-Health& Lifestyle.

Unit-III

IoT and M2M - M2M - Difference between IoT and M2M-SDN and NFV for IoT : Software Defined Networking- Network Function Virtualization. Developing Internet of things: IoT Platforms Design Methodology- Introduction- IoT Design Methodology: step 1: Purpose and requirements Specification- step 2: Process Specification- step 3: Domain Model Specification- step 4: Information Model Specification- step 5:Service Specifications- step 6:IoT Level Specification- step 7:Functional View Specification- step 8:Operational View Specification- step 9:Device and Component Integration- step 10:Application Development.

12 hours

12 hours

12 hours

Unit-IV

IoT Physical Devices & Endpoints: What is an IoT Device-Basic building blocks of IoT devices – Exemplary device: Raspberry Pi –About the board-Raspberry Pi Interfaces – Serial-SPI-I2C. Programming Raspberry Pi with Python-Controlling LED with Raspberry Pi-Interfacing LED and switch with Raspberry Pi-Interfacing a Light Sensor (LDR) with Raspberry Pi.

Unit-V

12hours

12 hours

Case Studies Illustrating IoT Design-Introduction-Home automation-Smart Lighting-Home Intrusion Detection-Cities-Smart Parking-Environment-Weather Monitoring System-Weather reporting Bot-Air Pollution Monitoring-Forest fire Detection-Agriculture-Smart Irrigation-Productivity Application-IoT printer.

	Unit	Chapters / Sections	
	Ι	1	
	II	2	
Text Book			
	IV	7 (7.1-7.3, 7.5 , 7.6)	
	V	9	

1. ArshdeepBahga, Vijay Madisetti, "Internet of Things: A Hands-on Approach", First Edition, Universities Press, 2021(Reprint).

Reference Books

- 1. AmmarRayes, SamereSalam, "Internet of Things From Hype to Reality", First Edition, Springer Publishers, 2017.
- 2. Raj Kamal, "Internet of Things Architecture and Design Principles", First Edition, Mc Graw Hill Education, 2017.
- 3. AgusKurniawan, "Smart Internet of Things Projects", First Edition, Packt Publishing Ltd., 2016.

Web Resources

- 1. https://nptel.ac.in/courses/106/105/106105166/
- 2. https://www.edureka.co/blog/iot-tutorial/
- 3. https://www.javatpoint.com/iot-internet-of-things/

Course Designers

- 1. Dr. S.Abirami
- 2. Mrs. M.B.C Ashavani

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Course		Course	Title	Categ	ory	L	Т	Р	Credit
UCA2	0CL61	Data Analy	tics Lab	CoreLab9		CoreLab9 -		4	2
		L-Lecture	T-Tutorial		P–P	ractical			
Year		Semester		Internal	Ext	ernal	r	Fotal	
III		VI		40	(60		100	

Preamble

Explore the practical knowledge in NoSQL with MongoDB, its working principles and implementation

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Create and explore the basics in database	75%	72%
CO2	Implement CRUD operations in MongoDB	78%	76%
CO3	Construct Arrays and applying Aggregate functions	76%	70%
CO4	Import and Export options in MongoDB	81%	80%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	Μ
CO2	S	S	S	S	Μ
CO3	S	S	S	S	Μ
CO4	S	S	S	S	Μ

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	Μ	L	L	S	S
CO2	S	Μ	L	Μ	Μ	S
CO3	S	Μ	Μ	Μ	S	Μ
CO4	S	S	L	S	S	S
	S-St	rong	M-Medi	ium	L-Low	

- 1. Create a database in MongoDB called myDB..
- 2. Check the existence of your database
- 3. Get the list of databases.
- 4. Drop the database.
- 5. Report the name of the current database.
- 6. Switch to a new database.
- 7. Display the current version of the MongoDB server

8.Reflect the statistics use state of the database

- 9. Type and view the db.help() command.
- 10. Apply CRUD operations in students collection
- 11. Implement Arrays in MongoDB
- 12. Apply Aggregate Functions
- 13. Import and Export documents in MongoDB

Web Resources:

- 1. https://www.tutorialspoint.com/mongodb/index.htm
- 2. https://www.w3schools.in/mongodb/tutorials/

Course Designers:

- 1. Dr.V.T.Meenatchi
- 2. Dr.S.Abirami

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

Cour Cod	rse le	Course '	Title	Catego	ory	L	Т	Р	Credit
UCA20	UCA20CL62 . Net Programming Lab Core Lab 10		ab	-	-	4	2		
		L - Lecture	T - Tutorial		P - I	Practic	als		
Year		Semester		Internal	Ex	kterna	ıl	Tota	1
III		VI		40		60		100	

Preamble

This .Net programming lab provides practical knowledge in console and window based applications.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO	1 Write programs with console based applications like calculating powervalues, list of factorial values, sum of square of two digit numbers in an array	75%	72%
CO	2 Develop programs using class, procedures, user defined functions and exception handling	73%	68%
CO	3 Implement programs using controls, design a GUI based game	74%	72%
CO	4 Generate programs for database manipulation (Insertion, selection) and dynamic webpage creation using ADO .Net. Dynamic web page creation using ASP.Net	77%	76%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	Μ	L	L	Μ	S
CO2	Μ	Μ	Μ	S	S
CO3	L	Μ	М	S	S
CO4	М	М	L	S	S

ThiagarajarCollege, Madurai.- 40thACM-Dept.ofCA&IT - Syllabus2020

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	L	S	S	L
CO2	S	Μ	Μ	Μ	S	Μ
CO3	S	Μ	L	S	S	Μ
CO4	S	S	S	М	S	S

S-Strong

M- Medium

L-Low

Content

Console Applications:

- 1. Write a VB .Net program for calculating power values.
- 2. Write a VB .Net program for the list of factorial values.
- 3. Write a VB .Net program for an equation.
- 4. Write a VB .Net program for any one sorting algorithm
- 5. Write a VB .Net program for the sum of square of two digit numbers in an array.
- 6. Write a VB .Net program for procedures.
- 7. Write a VB .Net program for user defined functions.
- 8. Write a VB .Net program for Exception Handling.
- 9. Write a VB .Net program for student information management system using class.

Window Based Applications:

- 1. Write a VB .Net program for dialog boxes.
- 2. Write a VB .Net program for the demo of Combo Box, Radio Button.
- 3. Write a VB .Net program for Miscellaneous control.
- 4. Write a VB .Net program for simple GUI based game.
- 5. Write a VB .Net program for database manipulation (Insertion, selection) using ADO .Net.
- 6. Write a VB .Net program for college bus maintenance system using ADO .Net.
- 7. Write a VB .Net program for login page creation using Asp.Net.
- 8. Write a VB .Net program for a dynamic webpage creation using Asp.Net, VB.NET

Web Resources:

1.http://www.becbapatla.ac.in/mca/Manuals/DOTNET%20LAB.pdf 2.https://mrgurpreetsingh.weebly.com/uploads/2/3/3/2/23321028/lab_manual.pdf

Course Designers:

- 1. Mrs. M.B.C.Ashavani
- 2. Dr. S.Abirami

SEC

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

	Course	Course Title		Category	L	Т	Р	Credit
	Code							
U	CA20SE51/	R Programming L	ab	SEC	-	-	2	2
UC	CA20SE61 (a)							
L - Le		cture T - Tutori	al	P – Pract	icals			_
Year	S	Interna	Extern	nal	Tot	tal		
III		15	35		5	0		

Preamble

This R tool lab course facilitates to apply simple commands in R and explore the data mining tasks with R. **Course Outcomes**

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Apply simple commands using R	75%	70%
CO2	Generate code using linear and logistic regression	70%	65%
CO3	Implement classification and clustering using R	80%	75%
CO4	Create code using association mining	75%	65%

Mapping of COs with POs

	PSO1	PSO2	PSO3	PSO4	PSO5
C01	S	Μ	Μ	Μ	L
CO2	S	Μ	Μ	L	L
CO3	S	Μ	Μ	L	L
CO4	S		М	L	L

S-Strong

M- Medium L-Low

Content

I. Applying Simple Commands in R

II. Regression:

- 1. How will you perform Logistic Regression
- 2. How will you perform Linear Regression

III. Classification:

- 1. Build decision tree with C5.0 to classify the dataset
- 2. Use Naïve Bayes algorithm for classification

IV. Clustering:

1. Apply K-Means clustering algorithm to cluster a dataset

V. Association:

1. Use Apriori algorithm for association mining

Web Resources:

- 1.http://gyan.fragnel.ac.in/lm/sem8/dwm.pdf
- 2.https://cran.r-project.org/doc/contrib/Paradis-rdebuts_en.pdf
- 3.https://spia.uga.edu/faculty_pages/rbakker/pols4150/RLabManual.pdf

4.https://www.westernsydney.edu.au/_data/assets/pdf_file/0011/830909/Rnotes_20180905_

web.pdf

5.http://www.iasri.res.in/ebook/TEFCPI_sampling/OVERVIEW%200F%20R%20SOFTWA

RE%20AND%20PRACTICAL%20EXERCISE.pdf

Course Designers:

- 1. Dr. V. T. Meenatchi
- 2. Dr. S. Abirami

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined BCA on or after June 2020)

Course Code	Course Title		Category	L	Т	Р	Credit
UCA20SE51/ UCA20SE61 (b)	Problem S	Solving using C	SEC	2	-	-	2
	L - Lecture	T - Tutorial	P - Pract	icals			

Year	Semester	Internal	External	Total
III	V/VI	15	35	50

Preamble

This course facilitates to get in depth knowledge in programming for complicated logics

Course Outcomes

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Develop programs for simple	85%	82%
	logics: Array, String, Looping		
	Structures, Pointers		
CO2	Ability to write Menu driven programs	83%	78%
CO3	Prepare for identifying the bugs in programs	80%	76%
CO4	Ability to write programs for complicated logics	75%	65%

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	Μ	S
CO2	S	S	S	Μ	S
CO3	S	S	S	Μ	S
CO4	S	S	S	Μ	S

K1 – Knowledge K2 – Understand K3

K3 – Apply

Mapping of Course Outcome with Programme Outcomes								
	PO1	PO2	PO3	PO4	PO5	PO6		
CO1	S	S	Μ	Μ	S	Μ		
CO2	S	S	Μ	Μ	S	Μ		
CO3	S	Μ	Μ	Μ	S	Μ		
CO4	S	S	Μ	Μ	S	Μ		

Blooms taxonomy: Assessment Pattern

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content – Problem Solving Using C

- 1. Program for finding the Composite Number
- 2. Program for finding the HCF of two Number
- 3. Program for finding the LCM of two Number
- 4. Program for finding twin prime Numbers
- 5. Program for Decimal to Octal conversion
- 6. Code Snip let for debugging.
- 7. Menu driven programs
- 8. Write a program to give the following output for the given input

9. Write a program to sort the elements in odd positions in descending order and elements in ascending order.

- 10. Given two sorted arrays, merge them such that the elements are not repeated
- 11. Using Recursion reverse the string such asEg 1: Input: one two threeOutput: three two one
- 12. Alternate sorting: Given an array of integers, rearrange the array in such a way that the first element is first maximum and second element is first minimum.

Eg.) Input : {1, 2, 3, 4, 5, 6, 7} Output : {7, 1, 6, 2, 5, 3, 4}

Course Designers:

Dr. S.Abirami
Dr. V.T Meenatchi

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

CourseC	code	Course T	Catego	ory	L	Т	Р	Credit	
UCA20	20SE51/ SE61 (c)	Machine Lea	Machine Learning			2	-	-	2
		L-Lecture	T-Tutorial	•	P -	Practic	cal		•
Year		Semester		Internal	E	xterna	al	Tota	l
III		V/VI		15		35		50	

Preamble

To understand the basic concepts of machine Learning with the learning model and algorithms.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Analyze methods and theories in the field of machine learning.	73%	70%
CO2	Discuss the role of decision tree learning, Bayesian learning, Genetic Algorithm and artificial neural network in real world problems	72%	70%
CO3	Compare different learning models and algorithms and utilize existing machine learning algorithms	70%	69%
CO4	Analyze the decision tree and Bayes theorem.	68%	68%

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	S	L	L
CO2	S	S	S	Μ	Μ
CO3	S	Μ	S	Μ	L
CO4	Μ	Μ	S	S	L

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	М	S	L	L	L
CO2	S	S	S	M	M	M
CO3	S	Μ	S	M	L	Μ
CO4	Μ	М	S	S	L	L
S-Strong	M-Medium		L-Low			

S-Strong

L-Low

Blooms taxonomy

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Content

Unit-I : Basic concepts

Basic concepts, Designing a learning system, Issues in machine learning. Overview of types of machine learning: Learning associations, Supervised learning (Classification and Regression Trees, Support vector machines), Unsupervised learning (Clustering), Instance-based learning (K-nearest Neighbour, Locally weighted regression, Radial Basis Function), Reinforcement learning (Learning Task, Q-learning, Value function approximation, Temporal difference learning).

Unit-II: **Decision Tree and Bayesian Learning:**

Decision Tree Learning: Decision tree representation, appropriate problems for decision tree learning, Univariate Trees (Classification and Regression), Multivariate Trees, Basic Decision Tree algorithms. Bayesian Learning: Overview of Bayes theorem and concept learning, Naive Bayes Learning Classifier, Bayesian belief networks.

Unit	Chapters/ Section
Ι	1(1.1-1.8, 1.12-1.15)
II	1(1.9,1.10,1.17, 1.18,1.19)

TextBooks:

- 1. Mitchell M., T., Machine Learning, McGraw Hill (2015) 4th tEdition.
- 2. Alpaydin E., Introduction to Machine Learning, MIT Press (2014) 3rdEdition.

References:

1. Bishop M., C., Pattern Recognition and Machine Learning, Springer-Verlag (2011) 2ndEdition.

2. Michie D., Spiegelhalter J. D., Taylor C. C., Campbell, J., Machine Learning, Neural and Statistical Classification. Overseas Press (2016)

Web References:

- 1. https://www.interactions.com/wp-content/uploads/2017/06/machine learning wp-5.pdf
- 2. https://mrcet.com/downloads/digital_notes/CSE/IV%20Year/MACHINE%20LEARNING(R17A0534).pdf

Course Designers:

1. Mrs. R.Umamaheswari 2. Dr. V.T. Meenatchi

15 hours

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Course Code	Course Title		Category	L	Т	Р	Credit
UCA20SE51/ UCA20SE61 (d)	Cloud Lab		SEC	-	-	2	2
	L - Lecture	T - Tutorial	P – Pract	icals			

Year	Semester	Internal	External	Total
III	V/VI	15	35	50

Preamble

Configure various virtualization tools such as Virtual Box, VMware workstation. Design and deploy a web application in a PaaS environment.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Install Oracle Virtual box and create two VMs on your laptop.	85%	82%
CO2	Install Turbo C in guest OS and execute C program.	83%	78%
CO3	Test ping command to test the communication between the guest OS and Host OS	74%	72%
CO4	Install Hadoop single node setup, Develop Hadoop applications	65%	60%

Mapping of Course Outcome with Programme Specific Outcomes

		PSO	l PSO	2 PSO3	B PSO	4 PSO5	5			
	C01	S	S	S	S	S				
	CO2	S	S	S	M	M				
	CO3	S	S	S	Μ	S				
	CO4	S	Μ	M	S	L				
Mapping of Course Outcome with Programme Outcomes										
		PO1	PO2	PO3	PO4	PO5	PO6			
Ī	CO1	S	S	М	Μ	S	Μ			
[CO2	S	S	L	Μ	S	Μ			

Thiagarajar College, Madurai. - 41th ACM - Department of CA & IT

CO3	S	Μ	L	L	S	Μ
CO4	S	S	Μ	Μ	S	Μ
S-Strong M-Medium		L-Low	7			

Blooms taxonomy: Assessment Pattern

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Course Content- CLOUD Lab

Simple Programs:

- 1. Install Oracle Virtual box and create two VMs on your laptop
- 2. Install Turbo C in guest OS and execute C program
- 3. Test ping command to test the communication between the guest OS and Host OS 4 Install Hadoop single node setup.
- 4. Develop hadoop application to count no of characters, no of words and each character frequency. Program to search an element
- 5. Develop hadoop application to process given data and produce results such as finding the year of maximum usage, year of minimum usage.
- Develop hadoop application to process given data and produce results such as how many female and male students in both schools the results should be in following format. GP-F #number GP-M #numbers MS-F #number MS-M #number
- 7. Establish an AWS account. Use the AWS Management Console to launch an EC2 instance and connect to it.

Web References

- 1. https://www.iare.ac.in/sites/default/files/lab1/CAD%20LAB%20UPDATED%20BY%20ANJAI AH-%20FINAL_1.pdf
- 2. <u>https://www.coursehero.com/file/85951061/CS8711-CLOUD-COMPUTING-LAB-MANUALpdf/</u>
- 3. https://mu.ac.in/wp-content/uploads/2021/07/WHOLE-CLOUD-COMPUTING-2.pdf
- 4. http://muresults.net/itacademic/MScIT/CM2.pdf

Course Designers

- 1. Dr. S.Abirami
- 2. Mrs. M.B.C Ashavani

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

Course		Course Title		Category	L	Τ	Р	Credit
UCA20SE51/		Digital Image Processing		SEC	2	-	-	2
UCA20SE61(e)		L - Lecture	T - Tutorial		P - Pra	acticals		
Year	Year Semester		Internal	Exte	rnal	J	Fotal	
III	II V/VI		15	3	5		50	

Preamble

This course facilitates the students to understand the basic concepts in Image Processing and able to apply image processing techniques for an image

Course

Outcomes

On the completion of the course the student will be able to

		Expected	Expected
#	Course Outcome	Proficiency	Attainment
CO1	Write programs with console	75%	72%
	based applications like		
	calculating powervalues, list of		
	factorial values, sum of square of		
	two digit numbers in an array		
CO2	Develop programs using class, procedures,	73%	68%
	user defined functions and exception		
	handling		
CO3	Implement programs using controls, design a	74%	72%
	GUI based game		
CO4	Generate programs for database	77%	76%
	manipulation (Insertion, selection) and		
	dynamic webpage creation using ADO .Net.		
	Dynamic web page creation using ASP.Net		

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	L	L	L
CO2	S	S	Μ	L	L	М

Thiagarajar College, Madurai. - 41th ACM - Department of CA & IT

CO3	S	S	Μ	L	L	Μ
CO4	S	S	Μ	L	L	S

S-Strong	M- Medium	L-Low	
Mapping of COs with PSOs			

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	L	L	L
CO2	S	S	Μ	Μ	L
CO3	S	S	Μ	L	L
CO4	S	S	Μ	М	L

Blooms taxonomy

	(CA	End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	30	30	65

Content

Unit -

15hours

I:

Introduction : What Is Digital Image Processing?-The Origins of Digital Image Processing -Examples of Fields that Use Digital Image Processing- Fundamental Steps in Digital Image Processing -Components of an Image Processing System .Digital Image Fundamentals: Elements of Visual Perception- Light and the Electro-magnetic Spectrum- Image Sensing and Acquisition-Image Sampling and Quantization.

Unit-II:

15hours

Digital Image Fundamentals: Some Basic Relationships between Pixels- An Introduction to the Mathematical Tools Used in Digital Image Processing. Image Compression: Fundamentals- Some Basic Compression Methods.

Unit	Chapters/ Section		
Ι	1, 2 (2.1-2.4)		
II	2 (2.5, 2.6 (2.6.1 – 2.6.7)), 8(8.1, 8.2)		

Text Books:

R.C. Gonzalez, R.E.Woods, 2016, Digital Image processing, 3rd edition, Pearson Education.

References:

- 1. Pratt. W.K., 2014, Digital Image Processing, 1st edition, John Wiley & Sons.
- 2. Annadurai, Shanmuga Lakshmi, 2007, Fundamentals of Digital Image Processing, PearsonEducation.
Web Resources:

1.https://www.tutorialspoint.com/dip/image_processing_introduction.htm

2.http://ultra.sdk.free.fr/docs/DxO/Digital%20Image%20Processing%20for%20Medical%

20 Applications.pdf

3.http://ebooks.bharathuniv.ac.in/gdlc1/gdlc1/Digital%20Image%20Processing/Digital%20Im

 $age\% 20 Processing\% 20\mathematical\% 20 Tools.pdf$

Course Designers:

- 1. M.B.C.Ashavani
- 2. Dr. S. Abirami

THIAGARAJAR COLLEGE, MADURAI-9

An Autonomous Institution Affiliated by Madurai Kamaraj University (Re-Accredited with "A++" Grade by NAAC)

DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined BCA on or after June 2020)

	Course Code	Course Tit	Category	L	T	Р	Credit	
UCA20	SE51/UCA20SE61(f)	Data Mining Lab	SEC	-	-	2	2	
		Tool)						
L - Lectur		e T - Tutorial		P – Practical	S			
Year	Semester		Internal	External		Total		
III	V/ VI		15	35		50		

Preamble

This course facilitates to have knowledge in WEKA tool by applying data mining techniques.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Generate code to view data in ARFF viewer and create CSV file	85%	82%
CO2	Apply algorithms in explorer to perform preprocess, classification and clustering	83%	78%
CO3	Compare algorithms with Experimenter using cross validation and split maker	74%	72%
CO4	Implement data mining tasks using knowledge flow	65%	60%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	М	L	L	L
CO2	S	S	М	L	L	М
CO3	S	S	Μ	L	L	М
CO4	S	S	Μ	L	L	S

S-Strong

M- Medium L-Low

Mapping of COs with PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	М	Μ	L
CO2	S	Μ	М	Μ	L
CO3	S	Μ	М	Μ	L
CO4	S	Μ	М	Μ	L
S-Strong	M- N	fedium	L-Low		

0.000

Content

I. CSV file & ARFF Viewer:

- 1. Given an Excel file, how will you create a CSV file and view the file?
- 2. Given an Excel file, how will you create an ARFF file and view the file through ARFF Viewer?

II. Explorer:

- 1. Use Explorer to perform Pre-process, for Replacing Missing Values
- 2. Use Explorer to perform Classification using J48 Algorithm
- 3. Use Explorer to perform Classification using Zero R Algorithm
- 4. Use Explorer to perform Classification using Ripper rule Algorithm
- 5. Use Explorer to perform Clustering using K-Means Algorithm
- 6. Use Explorer to perform Hierarchical Clustering
- 7. Use Explorer to perform Clustering using EM Algorithm
- 8. Use Explorer to perform Association using Apriori Algorithm
- 9. Use Explorer to perform Attribute Selection using Information Gain measure

III. Experimenter:

- 1. Compare J48, Ripper and Zero R using Experimenter environment for any 1 dataset
- 2. Compare J48, Ripper and Zero R using Experimenter environment for any of the n datasets
- 3. Use Experimenter to analyse the given dataset for J48 Algorithm using Cross Validation
- 4. Use Experimenter to analyse the given dataset for J48 Algorithm using Train Test Split Maker

IV. Knowledge Flow:

- 1. Use Knowledge Flow to perform classification
- 2. Use Knowledge Flow to perform clustering
- 3. Use Knowledge Flow to perform Association

Web Resources:

1.https://sudhagarblog.files.wordpress.com/2016/11/it6711-data-mining-lab.pdf

 $2. https://nasirunnisabtech.files.wordpress.com/2013/10/dataminig_lab_manual_softcopy_.pdf$

Course Designers:

- 1. Dr. V. T. Meenatchi
- 2. Dr. S. Abirami

B.Sc., Information Technology

Programme Code : UIT

Programme outcome-PO (Aligned with Graduate Attributes) – Bachelor of Science(B.Sc.,)

Scientific Knowledge and Critical Thinking

Apply the knowledge of Life Science, Physical and Chemical Science, Mathematics, statistics,

Computer science and humanities for the attainment of solutions to the problems that come across in

our day-to-day life/activities.

Problem Solving

Identify and analyze the problem and formulate solutions for problems using the principles of

mathematics, natural sciences with appropriate consideration for the public health, safety and

environmental considerations.,

Communication and Computer Literacy

Communicate the fundamental and advanced concepts of their discipline in written and oral form. Ableto make appropriate and effective use of information and information technology relevant to their discipline

Life-Long Learning

Recognize the need for and have the preparation and ability to engage in independent and life-long

learning in the broadest context of technological change.

Ethical, Social and Professional Understanding

Commitment to principles, codes of conduct and social responsibility in order to behave consistently

with personal respect. Acquire the responsibility to contribute for the personal development and for

the development of the community. Respect the ethical values, social responsibilities and diversity.

Innovative, Leadership and Entrepreneur Skill Development

Function as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

Become an entrepreneur by acquiring technical, communicative, problem solving, intellectual skills.

B.Sc. Information Technology

Vision:

• To exhibit innovative and heuristic knowledge in every IT arena with quality and holistic approach.

Mission:

- To facilitate the students to grab knowledge on various sectors of IT industry.
- To enhance the students to present their wisdom on governmental as well as non-governmental services.
- To equip the student to adapt and apply their skill set to acquire higher education opportunities.

Programme Educational Objectives (PEO):

The objectives of this programme is to equip/prepare the students to

PEO1	Equip the students to grab knowledge on various sectors of IT industry.
PEO2	Promote the students with cumulative skill set to provide solutions to a given
	real world problem using current trends and technology.
PEO3	Deliver a new generation with proficient on fundamental knowledge and recent
	trends on different disciplines in Information Technology.
PEO4	Facilitate the student to adapt and apply their skill set to acquire higher
	education opportunities.
PEO5	Enhance the students to present their wisdom on governmental as well as non-
	governmental services.

Programme Specific Outcomes – B.Sc.(Information Technology)

On the successful completion of B.Sc., Information the students will

PO1	Acquire fundamental concepts, methods and practices of Information
	Technology to develop theoretical and practical skill sets.
PO2	Justify the optimum technique to allocate memory resources, processors, I/O
	peripherals to provide optimal programmatic solution to a real world problem.
PO3	Support to gain skills on basic as well as trendy software languages and
	packages to design web sites, web apps and real time software projects.
PO4	Promote the students to generalize and distinguish the characters of different
	systems for different environment.
PO5	To trigger the students to enroll in to the research areas of IT industry like cloud
	computing and data analysis.

THIAGARAJAR COLLEGE, MADURAI – 9. DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY B.Sc. INFORMATION TECHNOLOGY(w.e.f. 2020 batch onwards) Programme Code-UIT <u>Semester – I</u>

Course	Code No.	Subject	Hour s	Credit s	Total No. of Hours Allotte d	Max. Mark s CA	Max. Mark s SE	Total
Part I	U20TM11	Tamil	5	3	75	25	75	100
Part II	U20EN11	English	4	3	60	25	75	100
Core 1	UIT20C11	Programming in C	4	4	60	25	75	100
Core 2	UIT20C12	Digital Principles and Computer Organization	4	4	60	25	75	100
Core Lab	UIT20CL1 1	Programming in C Lab	3	2	45	40	60	100
Core Lab 2	UIT20CL1 2	Digital Design Lab	3	2	45	40	60	100
Generic Elective 1	UMA20GE 11IT	Mathematical foundation for CS	5	5	75	25	75	100
AECC	U20ES11	Environmental Studies	2	2	30	15	35	50
TOTAL			30	25	450	220	530	750

Semester-II

Course	Code No.	Subject	Hour s	Credits	Total No. of Hours Allotte d	Max. Mark s CA	Max. Mark s SE	Total
Part I	U20TM21	Tamil	5	3	75	25	75	100
Part II	U20EN22	English	4	3	60	25	75	100
Core 3	UIT20C21	Data Structures	4	4	60	25	75	100
Core 4	UIT20C22	Microprocessor and Assembly Language Programming	4	4	60	25	75	100
Core Lab 3	UIT20CL2 1	Data Structures using C Lab	3	2	45	40	60	100
Core Lab 4	UIT20CL2 2	Basics of Web Technology Lab	3	2	45	40	60	100
Generic Elective2	UMA20GE 21IT	Probability and Statistics	5	5	75	25	75	100
AECC	U20VE21	Value Education	2	1	30	15	35	50
TOTAL			30	24	450	220	530	750

<u>Semester – III</u>

Course	Code No.	Subject	Hour s	Credit s	Total No. of Hours Allotted	Max. Mark s CA	Max. Mark s SE	Total
Core 5	UIT20C31	Java Programming	5	4	75	25	75	100
Core 6	UIT20C32	Relational Database Management System	5	4	75	25	75	100
Core Lab 5	UIT20CL31	Java Programming Lab	4	2	60	40	60	100
Core Lab 6	UIT20CL32	RDBMS Lab	4	2	60	40	60	100
Core Elective I	UIT20CE31 (A/B/C/D)	Options given	5	5	75	25	75	100
Generic Elective 3	UMA20GE 31IT	Computational Methods	5	5	75	25	75	100
NME I	UIT20NE31	Open Source Technology	2	2	30	15	35	50
TOTAL			30	24	450	195	455	650

Semester – IV

Course	Code No.	Subject	Hour s	Credit s	Total No. of Hours Allotted	Max. Mark s CA	Max. Mark s SE	Total
Core 7	UIT20C41	Operating System	5	4	75	25	75	100
Core 8	UIT20C42	Python Programming	5	4	75	25	75	100
Core Lab 7	UIT20CL41	Operating System Lab	4	2	60	40	60	100
Core Lab 8	UIT20CL42	Python Programming Lab	4	2	60	40	60	100
Core Elective II	UIT20CE41 (/E/F/G/H/I)	Options given	5	5	75	25	75	100
Generic Elective4	UIT20GE41	Operations Research	5	5	75	25	75	100
NME II	UIT20NE41	Internet Security - Principles and Practices	2	2	30	15	35	50
TOTAL			30	24	450	195	455	650

<u>Semester – V</u>

Course	Code No.	Subject	Hour s	Credit s	Total No. of Hours Allotted	Max. Mark s CA	Max. Mark s SE	Total
Core 9	UIT20C51	Web Designing	5	4	75	25	75	100
Core 10	UIT20C52	Computer Networks	5	4	75	25	75	100
Core 11	UIT20C53	Software Engineering	5	4	75	25	75	100
Core Lab 9	UIT20CL51	Web Designing Lab	5	2	75	40	60	100
Core Lab 10	UIT20CL52	Network Lab using Java	4	2	60	40	60	100
Project	UIT20PJ51	Major Project	4	2	60	25	75	100
SEC I	UIT20SE51	Options given	2	2	30	15	35	50
TOTAL			30	20	450	195	455	650
	UIT20IN	Internship		2		15	35	50

<u>Semester – VI</u>

Course	Code No.	Subject	Hour s	Credit s	Total No. of Hours Allotted	Max. Mark s CA	Max. Mark s SE	Total
Core 12	UIT20C61	C# Using .Net	6	6	90	25	75	100
Core 13	UIT20C62	Mobile Application Development	5	4	75	25	75	100
Core 14	UIT20C63	Data Warehousing & Mining	6	5	90	25	75	100
Core Lab 11	UIT20CL61	C# Using .Net Lab	5	2	75	40	60	100
Core Lab 12	UIT20CL62	Mobile Application Development Lab	6	3	90	40	60	100
SEC II	UIT20SE61	Options given	2	2	30	15	35	50
Part V				1		75	25	100
TOTAL			30	23	450	170	380	550
TOTAL CREDITS FOR SEMESTERS I to VI			140+2					

Thiagarajar College, Madurai. 41st ACM - Department of CA & IT- Syllabus 2020L85

Consolidation of contact hours and credits: UG

Semeste	Contact Hrs./	Credits
r	Week	
Ι	30hrs	25
II	30hrs	24
III	30hrs	24
IV	30hrs	24
V	30hrs	20
VI	30hrs	23
Part– V	-	01
Total	180hrs	140
V	Internship	2
V	Additional credit (Self study - paper)	5

B) Curriculum Credits: Part wise

		No. of papers	Credits per paper	Total credits
Part I	Tamil	2	3	06
Part II	English	2	3	06
Part III	Core Theory	1+1+12	6/5/4	59
	Core lab	1+11	3/2	25
	Core Elective	2	5	10
	Generic	4	5	20
	Elective			
	Theory			
	Project	1	2	2
Part IV	AEČC	2	2+1	03
	NME	2	2	04
	SEC	2	2	04
	01			
	In	ternship		2
	Grand total			

Core Electives

- A. Soft Computing
- B. E Commerce
- C. Software Project Management
- D. Digital Image Processing
- E. Cloud Computing
- F. Principles of Data Communication
- G. Computer Forensics
- H. Big Data Analytics
- I. Aptitude & Reasoning

<u>SBE</u>

- A. Robotics
- B. Multimedia Lab (Photoshop, Corel Draw, Flash)
- C. Embedded System
- D. Cassandra Lab
- E. Hardware Assembling and Troubleshooting
- F. R-Programming Lab

NME

- 1. Open Source Technology NME I
- 2. Internet Security Principles and Practices NME II

THIAGARAJAR COLLEGE, MADURAI- 9 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UI

Course Code	Course Title		Category	L	Т	Р	Credit
UIT20C51	Web Designing	5	Core-9	4	1	0	4
L	- Lecture	T - Tutorial	P - Pra	ctical	S		

Year	Semester	Max.	Max.	Total
		Marks	Marks	
		CA	SE	
III	V	25	75	100

Preamble

Provoke knowledge on the basics of web programming and to train the abilities to develop user friendly applications using PHP with it's Database connectivity.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Describe various essential operators on PHP with it's precedence using programmatic examples.	78%	72%
CO2	Illustrate the control and loop structure available on PHP.	75%	70%
CO3	Work with strings, arrays and functions.	70%	65%
CO4	Handle web development controls and performs the data validation.	70%	62%
CO5	Connect Data Base and manipulate data.	70%	60%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	Μ	L
CO2	S	Μ	S	Μ	Μ
CO3	Μ	Μ	S	L	L
CO4	S	Μ	S	Μ	L
CO5	Μ	L	S	L	L

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
C01	S	Μ	S	L	L	L
CO2	S	L	Μ	Μ	Μ	Μ
CO3	M	Μ	S	L	L	L
CO4	S	Μ	L	Μ	Μ	Μ
CO5	S	Μ	S	Μ	Μ	L

(S - Strong, M - Medium, L - Low)

Blooms taxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Web Designing

Unit I :

HTML programming: HTML- working with list, working with Images, Introduction to Forms.

16 hours

15 hours

15 hours

14 hours

Essential PHP: Enter PHP - Getting PHP - Operators and Flow Control – PHP's Math Operators – Working with the Assignment Operators – Incrementing and Decrementing Values – The PHP String Operators – The Bitwise Operators – The Execution Operator – PHP Operator precedence.

Unit II :

Using the If statement - The PHP Comparison Operators – The PHP Logical Operators - The else statement - The else if statement, The ternary Operator - switch statement, Using for Loops, Using while Loop, using do...while statement, using the foreach loop, Terminating Loops Early – Skipping Iterations.

Unit III :

Strings and Arrays : The String Functions – Converting to and from Strings – Formatting Text Strings – Building Yourself Some Arrays – Modifying the Data in Arrays – Deleting Array Elements **Creating Functions:** Creating Functions in PHP – Passing Functions Some Data – Passing Arrays to Functions – Passing by Reference –Using Default Arguments – Passing Variable Numbers of Arguments – Returning data from functions – Returning Arrays

Unit IV:

Reading Data in web pages: Setting Up Web Pages to Communicate with PHP – Handling Text Fields, Text Areas, Check Boxes, Radio Buttons, List boxes, Password control, Hidden control, Image Maps, File Uploads, Button. PHP Browser – Handling Power: Using PHP's Server Variables - Using HTTP Headers - Getting the User's Browser Type – Redirecting Browser Type – Dumping a Form's Data All at Once – Handing Form Data with custom arrays – Putting it all in one page - Performing Data Validation – Checking if the User Entered Required Data – Requiring Numbers, Text.

Unit V :

15 hours

Working with Databases: What is a Database, Some Essential SQL, Creating a MySQL Database, Creating a New Table – Putting Data into the New Database – Accessing the Database in PHP – Updating Databases – Inserting New Data Items into a Database – Deleting Records – Creating New Tables, New Database.

Text Books:

1. Kogent Learning Solutions, 2013, Web Technologies Black book, Dream Tech Press, New Delhi.

2. Steven Holzner, Reprint 2018, The complete Reference PHP, Tata McGraw Hill Education (India) Private Limited.

Unit	Chapters(pages)
Ι	Book 1: chapter 1 (1 to 23 pages)
	Book 2: 1 (1 to 37),
	2 (41 to 54)
II	Book2: 2 (55 to 79)
III	Book2: 3 (81 to 98)
	Book2: 4 (123 to 139)
IV	Book2:5 (161 to 192)
	Book2: 6 (203 to 234)
V	Book2: 10 (361 to 392)

References:

- 1. Kevin Tetrol and 'O' Reilly, 2014, Programming PHP, Pearson Education, Prentice Hall of India, New Delhi.
- 2. Ivan Bayross, SharanamShah ,Eleventh Print 2013, PHP 5.1 for beginners, Shrofff publishers.

Web Resources:

- 1. https://www.c-sharpcorner.com/article/how-to-design-a-web-page-using-php/
- 2. https://www.w3schools.com/
- 3. https://www.php-web-design.com/

Course Designers:

- 1. Mrs. P. Praveena
- 2. Mr. S. Kumarappan

THIAGARAJAR COLLEGE, MADURAI- 9 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020) Programme Code – UIT

Course	Course Title		Category	L	Т	Р	Credit
Code							
UIT20C52	Computer Networks		Core-10	4	1	0	4
	L - Lecture	T - Tutorial	Р	- Pract	icals		

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	V	25	75	100

Preamble

To gain knowledge on computer networks, protocols, transmission media and familiar with the network error detection and correction. Give knowledge about network security and its applications.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Identify Data Communications, Network and its Types,	80%	78%
	Internet History and The OSI Model.		
CO2	Describe the basic concepts of Physical Layer,	73%	70%
	Transmission Media, switching Data Link Layer, Error		
	Detection and Correction.		
CO3	Explain Data Link Layer, Wired LANS and Ethernet.	80%	75%
CO4	Relate the various routing algorithms, Unicast routing	70%	62%
	and multicast routing techniques.		
CO5	Compute Cryptography, Network Security and digital	70%	60%
	signature.		
1			

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	М	L	L
CO2	М	S	М	М	L
CO3	S	М	L	S	М

CO5	М	S	Μ	Μ
CO4	3	3	L	6

C

(S - Strong, M - Medium, L - Low)

C

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	М	S	L	L	М
CO2	S	L	Μ	Μ	Μ	Μ
CO3	Μ	Μ	S	L	L	L
CO4	Μ	S	L	Μ	Μ	Μ
CO5	Μ	S	S	Μ	L	L

C

L L

(S - Strong, M - Medium, L - Low)

Bloos taxonomy

004

	CA		End of	
	First	Second	Semester	
Knowledge-K1	40%	40%	40%	
Understand-K2	40%	40%	40%	
Apply-K3	20%	20%	20%	
Total marks	52	52	140	

Computer Networks

UNIT I

Introduction: Data Communications – Networks – Network Types – Internet History - Protocol Layering: TCP/IP Protocol Suite - The OSI Model.

UNIT II:

Physical Layer: Data and Signals - Transmission Impairment – Performance -Transmission Media : Introduction - Guided Media – Unguided Media: Wireless-Switching: Circuit Switched Networks - Packet Switching – Data Link Layer : Introduction – Link Layer Addressing – Error Detection And Correction : Introduction - Types of Errors – Block Coding – Cyclic Codes – Checksum.

UNIT III:

Data Link Control: DLC Services - Data Link Layer Protocols – HDLC – Point to Point Protocol (PPP) – **Wired LANs : Ethernet** : Ethernet Protocol – Standard Ethernet – Fast Ethernet – Gigabit Ethernet.

UNIT IV:

Unicast Routing : Introduction - Routing Algorithms – Unicast Routing Protocols – **Multicast Routing** : Introduction – Multicasting Basics – IntraDomain Multicast Protocols – InterDomain Multicast Protocols.

15 hours

15 hours

15 hours

15 hours

UNIT V:

Cryptography and Network Security: Introduction – Confidentiality – Other Aspects of Security – **Internet Security** – Firewall.

Text Books:

1. Behrouz A. Forouzan : 2013. "Data Communications And Networking", Fifth Edition, Tata Mcgraw Hill Education (India) Private Ltd.

Units	Chapters/Sections
Ι	1(1.1 to 1.4), 2(2.1 to 2.3)
II	3(3.1, 3.4, 3.6), 7(7.1,7.2,7.3), 8(8.2, 8.3),9(9.1, 9.2), 10(10.1,10.1.1, 10.2, 10.3, 10.4)
III	11(11.1, 11.2, 11.3, 11.4), 13(13.1, 13.2, 13.3, 13.4)
IV	20(20.1, 20.2, 20.3), 21(21.1, 21.2, 21.3, 21.4)
V	31(31.1 to 31.3), 32(32.4)

References:

1. Andrew S. Tanenbaum:2011. "Computer Networks", Fifth Edition, Pearson Prentice Hall.

2. TularamM.Bansod: 2013. "Computer Networks", Kogent Learning Solutions Inc, Dreamtech Press.

Web Resources:

https://www.geeksforgeeks.org/computer-network-tutorials

https://www.studytonight.com/computer-networks/

Course Designers:

1. Mr. S.Kumarappan

2. Mrs. P. Praveena

THIAGARAJAR COLLEGE, MADURAI-9

(An Autonomous Institution, affiliated to Madurai Kamaraj University) DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020) Brogromme Code UIT

Programme Code – UIT

Cours	Course Title	Category	L	Т	Р	Credit
UIT20C53	Software Engineering	Core - 11	4	1	0	4
	L - Lecture T - T	utorial P	- Pract	icals		

Year	Semester	Max. Marks	Max.	Total
		CA	Marks SE	
III	V	25	75	100

Preamble

Build basic knowledge on software system development process, practices, techniques and to get awareness on software testing, software verification and validation.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Define software engineering, project, system and discuss various types of projects.	80%	75%
CO2	Depicts various cost estimation techniques with their pros and cons.	73%	70%
CO3	Sketch out the steps for system analysis with different techniques.	70%	65%
CO4	Prepare system design notations with various design techniques.	68%	62%
CO5	Describe System testing and it's different types to verify and validate the software project.	65%	60%

K1 - Knowledge

K2 - Understand

K3 - Apply

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	Μ	S	L	Μ
CO2	S	L	Μ	Μ	Μ
CO3	Μ	Μ	S	S	L
CO4	Μ	S	S	Μ	L
CO5	S	L	Μ	Μ	L

Thiagarajar College, Madurai. 41st ACM - Department of CA & IT- Syllabus 2020 L96

(S - Strong, M - Medium, L - Low)

	PO1	PO2	PO3	PO4	PO5	PO6
C01	S	M	S	M	М	L
CO2	S	L	Μ	M	L	L
CO3	М	M	S	L	L	L
CO4	Μ	S	L	M	Μ	L
CO5	Μ	S	S	M	L	L

Mapping of Course Outcome with Programme Specific Outcomes

(S - Strong, M - Medium, L - Low)

Blooms taxonomy

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Software Engineering

Unit -1:

Introduction to Software Engineering: Some definitions – Some Size factors – Quality and Productivity Factors – Managerial issues–**Planning a Software project-**Defining the Problem – Developing a solution Strategy – Planning the development process – prototype model – Planning an Organizational Structure – Other planning activities.

Unit -II:

Software Cost Estimation: Software Cost factors – Software cost estimation Techniques- Expert Judgement – Delphi Cost Estimation – Work Break Down Structure-Algorithmic Cost Model – Staffing- level estimation -Estimating Software Maintenance Costs.

Unit -III:

Software Requirements Definition: The Software Requirements Specification – Formal Specification Techniques –Language and Processor for Requirement Specification: PSL / PSA – RSL / REVS – Structured Analysis and Design Technique(SADT) – Structured System Analysis (SSA) – GIST.

Unit -IV:

Software Design: Fundamental Design Concepts: Abstraction – Information Hiding – Structure – Modularity – Concurrency – Verification – Aesthetics – Modules and modularizing Criteria – Coupling and Cohesion – Other Modularization Criteria – Design Notations: Data Flow Diagrams – Structure Charts – HIPO Diagrams – Procedure Templates

15 hours

16-hours

14hours

15hours

 Pseudo code – Structured Flowchart -Structure English – Decision tables– Design Techniques – Detailed Design Consideration – Real time and distributed system design – test plan – milestones, walkthrough and Inspection .

Unit-V:

15 hours

Verification and validation Techniques: Quality assurance- walkthroughs and Inspections –static Analysis- symbolic Execution unit testing and debugging—system testing—formal verification.

Text Books:

1. Richard.E.Fairely, 2014 Reprint. Software Engineering Concepts, Tata McGraw – Hill Education Private Limited, New Delhi.

UNIT	CHAPTER/SECTIONS)
Ι	1(1.1-1.4),2(2.1—2.5)
II	3(3.1-3.4)
III	4(4.1—4.4)
IV	(5.1—5.8)
V	8(8.1—8.7)

References:

1. Ian Sommerville, 2015.Software Engineering, 9thedition, Pearson Indian Education Service Private

Limited, Chennai.

2. PankajJalote 2015, An Integrated Approach to Software Engineering, 3rdedition, Narosa Publishing House, New Delhi.

3. Roger S.Pressman, 2015. Software Engineering A Practitioner's Approach, 7th edition, Tata McGraw – Hill Education Private Limited, New Delhi.

Web Resources:

1. <u>www.w3schools.com/html</u>

2. https://developer.mozilla.org/en-US/docs/Learn/

Course Designers:

- 1. Mr. S. Kumarappan
- 2. Mrs.M.Gayathiri

THIAGARAJAR COLLEGE, MADURAI-9

(An Autonomous Institution, affiliated to Madurai Kamaraj University) **DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY** (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course T	itle	Category	L	Т	Р	Credit
UIT20CL51	Web Designing I	Lab	Core Lab - 9	0	0	5	2
-	L - Lecture	T - Tutori	ial P	– Pract	icals		

L - Lecture

Year	Semester	Max. Marks	Max.	Total
		CA	Marks SE	
III	V	40	60	100

Preamble

Focus the basics of web programming and train to develop user friendly applications using PHP with it's Database connectivity.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Explain the basics of PHP and it's different operators.	75%	70%
CO2	Develop and Control loop structures available on PHP.	73%	70%
CO3	Manipulate strings, arrays and functions.	70%	65%
CO4	Develop web programs, Connect PHP with DataBase and manipulate data.	68%	62%

Mapping of COs with POs

	PO1	PO2	PO3	PO4	PO5
CO1	S	Μ	S	L	М
CO2	S	S	М	Μ	S
CO3	S	Μ	L	Μ	S
CO4	Μ	Μ	S	L	L

(S - Strong, M - Medium, L - Low)

Mappingof

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	L	L	L	L
CO2	S	Μ	М	М	Μ	Μ
CO3	Μ	L	М	М	Μ	Μ
CO4	S	L	М	L	L	Μ

CourseOutcomewithProgrammeOutcomes

(S – Strong, M – Medium , L – Low)

Web Designing Lab

- 1. Write a program to check & print whether a given number in even or odd.
- 2. Write a program to find the largest among 3 numbers using ternary operation.
- 3. Write a program to print the sum of digits of a given number (using while loop)
- 4. Write a program to print Fibonacci series.
- 5. Write a program to enter number till the user wants. At the end it should display count of positive, negative and zeros entered. (using do while loop)
- 6. Write a function which finds the Number times each word Occurs on the given input sentence.
- 7. Write a Menu-Driver program to implement a calculator which performance only addition, subtraction, multiplication and division. (Using switch case)
- 8. Write a function to swap two string using call by value & call by reference.
- 9. Write a program to create a file & write contents to it and display it. Then append some data to it.
- 10. Create a login form which verifies user name and password to a particular strings (User name: Thiagarajar, password: art&science) if they are correct, it should be redirected to welcome. HTML page or it should be redirected to sorry HTML Page.
- 11. Write a program to arrange the given number is ascending order (Using array)
- 12. Write a program to perform matrix addition
- 13. Create a form which gets inputs from user and redirect the user to another page which contains content based on the user input.
- 14. Create a form which accept a number from 2 to 1000 and check whether it is Armstrong or not.
- 15. Develop an application to implement database connectivity.

Course Designers:

1. Mrs. P. Praveena

2. Mrs. M. Gayathiri

THIAGARAJAR COLLEGE, MADURAI-9

(An Autonomous Institution, affiliated to Madurai Kamaraj University) DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme	Code -	UIT
IIVEIammu	Cout -	ULL

Course Code	Course Title	Category	L	Τ	Р	Credit
UIT20CL52	Network Lab Using JAVA	Core Lab-10	0	0	4	2
	L - Lecture T - Tutoria	P – 1	Practi	cals		

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	V	40	60	100

Preamble

Focus the basics of network programming, Train to connect and configure basic networking devices through LAN.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Demonstrate the basics commands of networking.	80%	75%
CO2	Connect the different devices through LAN	73%	70%
CO3	Develop the networking program using TCP/IP and UDP protocol.	70%	65%
CO4	Develop the networking program using Java Networking Classes	68%	62%

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	М	S	L	М
CO2	S	Μ	S	М	L

CO3	S	S	М	М	Μ
CO4	М	М	L	S	S

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
C01	S	Μ	S	Μ	Μ	L
CO2	S	L	S	М	Μ	М
CO3	S	Μ	S	L	L	Μ
CO4	Μ	S	L	Μ	L	L

(S – Strong, M – Medium , L – Low)

Network Lab Using JAVA

- 1. Executing Basic Networking Commands
- 2. Developing a program to Establish connection between client and server
- 3. Program to get protocol, hostname, port number and file name for given URL
- 4. Developing Client- Server Application for Chat
- 5. Program to get IP Address for given URL at runtime
- 6. Program to print MAC address of a host system
- 7. Check whether port is being used by a server using socket
- 8. Getting a file size from the server
- 9. Reading a HTML code of a given URL
- 10. Program to Transfer Data using Datagram socket Class

Course Designers:

- 1. Mr. S. Kumarappan.
- 2. Mrs. P. Praveena

Thiagarajar College (Autonomous):: Madurai - 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

	Course Code		Course Title	Category	' L	Т	Р	Credit
	UIT20C61		C# using .Net	Core 12	6		0	6
ctu	ire	T-Tutorial	P –Practicals					

L-Lecture

P–Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	VI	25	75	100

Preamble

Familiarize with Net framework and to promote skills to develop console, windows and web applications on C#.NET using Visual StudioIDE.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainme nt
CO1	Describes the basic concepts of .net framework and specify the CLR with it's features.	75%	75%
CO2	Describes the C#.Net with Object Oriented View and it's various construct like loops, decision making, classes and objects	73%	70%
CO3	Discuss How to handle Arrays, Strings and Creating Structures and Enumerations	74%	65%
CO4	Explain how to create classes, Objects, Types of Inheritance, Polymorphism and Interface	69%	62%
CO5	Explain How to manage Operator Overload Errors, Exceptions. How to create Window based and web based Application using .Net	63%	60%

Mappingof **COswithPOs**

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	L	L
CO2	Μ	S	M	Μ	L
CO3	S	Μ	L	S	Μ
CO4	S	S	L	S	L
CO5	Μ	S	M	М	L

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	М	S	L	L	L
CO2	S	L	Μ	Μ	L	L
CO3	Μ	Μ	S	L	L	L
CO4	Μ	S	L	Μ	Μ	L
CO5	S	М	Μ	L	S	L

(S - Strong, M - Medium, L - Low)

C# using

Net

Unit I:

Understanding .NET-The .Net Framework-Common Language Runtime (CLR)-Framework Base Classes

Overview of C#-Namespaces-Adding Comments-Main Returning a value-Command Line Arguments-Multiple Main Methods-Literals, Variables, Data Types-Value Type Reference Type- **Operators**, **Expressions**-Arithmetic, Logical, Assignment Operators-Arithmetic Expression-Evaluating an Expression

Unit II:

Decision Making and Branching-Simple IF, IF Else..., Else IF, Nested IF -Decision making and Looping- While, Do While, For and ForEach, Methods in C#-Declaring A Method-Invoking a Method-Method Parameters-Pass By Value-Pass by Reference.

Unit III:

18 hours

18 hours

Handling array-Creating Array-One Dimensional Array-Creating An Array-Multi Dimensional Array-Array List Class- Manipulating Strings-String Methods-Inserting, Comparing, Finding Sub String-Structures and Enumerations

Unit IV

Classes and Objects-Defining a Class- Adding Variables-Adding Methods-Member Access Modifiers. Inheritance and Polymorphism- Classical, Containment Inheritance-Multi level Inheritance-Interfaces-Multiple Interface.

18 hours

18 hours

UnitV:

18hours

Operator Overloading-Over Loadable Operators-Overloading Unary and Binary Operators-**Managing Errors and Exceptions**-Types Of Errors –Exceptions-Multi Catch Statement-The Exception Hierarchy- **Window form ,Web Based Application Development in .Net**-Creating Window Forms-Customizing a From

TextBooks:

1. E.Balagurusamy, Reprint2017, Programming in C#aprimer, McGraw Hill Publication.

Unit	Chapters
Ι	2,3,4,5
II	6,7,8
III	9,10,11
IV	12,13,14
V	15,18,20

Web

Resources

1. <u>www.w3schools.com/html</u>

2. <u>https://www.tutorialspoint.com/html/html_basic_tags.htm</u>

3. <u>https://developer.mozilla.org/en-</u>

US/docs/Learn/Getting_started_with_the_web/HTML_basics

Course Designers

1. Mrs.M.Gayathiri

2. Mrs. J.I.ChristyEuinacy

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course Title	Category	L	Т	Р	Credit
UIT20C62	Mobile Application Development	Core-13	4	1	0	4
L - Le	ecture T - Tutorial P – Pra	cticals				

Year	Semester	Max.	Max.	Total
		Marks CA	MarksSE	
III	VI	25	75	100
Pre	amhle			

To learn the characteristics, components of Android applications, User Interfaces in mobile applications and working with Graphics, Animations, Audio and Video.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficienc y	Expected Attainmen t					
Mappir	Mapping of Course Outcomes with Program Outcomes							
CO1	Define Android Applications, Download and Install Android, Work	75%	70%					
-----	---	-----	-----					
	In development environment and to execute the First Android Application.							
CO2	Explain the basic concepts of using Activities, Fragments	75%	70%					
	and Intents in Android, to invoke Built-in Applications and							
	working with User Interface Using Views and View Groups.							
CO3	Work with User Interface to handle Pictures and Menus, how to use the Analog Clock and Digital Clock Views, to embed Web Browser in an Activity and also to notify to the User.	73%	65%					
CO4	Store the Data Persistently, Internal and External Storage, Working with Graphics and Animations.	68%	62%					
CO5	Work with Graphics and Animations, Audio, Video and Camera.	65%	60%					

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	Μ	S	М
CO2	S	S	S	Μ	S	Μ
CO3	S	S	М	Μ	Μ	S
CO4	S	S	Μ	Μ	S	S
CO5	S	S	Μ	Μ	Μ	S

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcomes with ProgramSpecificOutcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	М	S	Μ	М
CO2	S	S	М	Μ	Μ
CO3	Μ	М	S	S	S
CO4	S	Μ	S	Μ	L
CO5	S	S	S	Μ	L

(S – Strong, M – Medium, L – Low)

Blooms taxonomy: Assessment Pattern

	CA		End of Semester
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Mohile Annlication	Developp	nent	•

UNITI

14 hours

Getting an Overview of Android: Introducing Android– Discussing about Android Applications –The Manifest File – Downloading and Installing Android– Exploring the Development Environment–Developing and Executing the First Android Application.

15 hours

17 hours

14 hours

15 hours

Using Activities, Fragments and Intents in Android :Working with Activities – Using Intents – Fragments – Using the Intent Object to Invoke Built-in Application. Working with User Interface Using Views and View Groups :Working with View Groups – Working with Views –Binding Data with the Adapter View Class.

UNITIII

UNITII

Working with User Interface Using Views and View Groups: Designing the AutoText Complete View–Implementing Screen Orientation–Designing the Views Programmatically –Handling UI Events–Specialized Fragments–Creating Menus. **Handling Pictures and Menus with Views :**Working with Image Views – Designing Context Menu for Image View – Using the Analog Clock and Digital Clock Views – Embedding Web Browser in an Activity –Notifying the User.

UNITIV

Storing the Data Persistently : Introducing the Data Storage Options – Using the Internal Storage–Using the External Storage–Using the SQLite Database-Working with Content Providers–**Working with Graphics and Animations**: Working with Graphics–Using the Drawable Object–Using the Shape Drawable Object.

UNITV

Working with Graphics and Animations :Working with the Nine Patch Drawable Graphics –Understanding the concept of Hardware Acceleration – Working with Animations. **Audio, Video and Camera**–Role of Media Play Back – Using Media Player – Recording and Playing Sound.

Text Books:

1. PradeepKothari, 2019, "Android Application Development Black BOOK", DreamTech.

UNIT	Chapter/PageNos.
Ι	2(Pg.:50-74)

II	3(Pg.:80-126),4(Pg.:135-172)
III	4(Pg.:178-198),5(Pg.:206-226)
IV	6(Pg.:229-262),9(Pg.:330-340)
V	9(Pg.: 343-351),10(Pg.:362-375)

References:

- 1. Grant Allen, 2021, "Android for Absolute Beginners", Apress.
- 2. JD Glaser, 2017, "Secure Development for Mobile App", CRC Press.

3. Sarah Guthals Ph.d, 2017, "Building a Mobile App Design & Program You own App", Dummies books.

Web Resources:

- 1. <u>http://developer.android.com/guide/components/activities.html6</u>
- 2. <u>https://www.javatpoint.com/android-tutorial</u>
- 3. <u>https://www.tutorialspoint.com/android/android_studio.htm</u>
- 4. https://www.geeksforgeeks.org/android-studio-tutorial/
- 5. https://www.edureka.co/blog/android-studio-tutorial/

Course Designers:

- 1. Mrs. P.Praveena
- 2. Mrs. M.Gayathiri

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course Title	Category	L	T	Р	Credit
UIT20C63	Data Warehousing and Mining	Core-14	5	1	0	5
	L - Lecture T - Tutorial	P –Practicals				

Year	Semester	Max.	Max.	Total
		Marks CA	Marks SE	
III	VI	25	75	100

Preamble

This course provides the basic concepts, principles, methods, implementation techniques and

applications of data mining.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Identify the functionalities of Data Mining and various techniques to extract knowledge.	76%	71%
CO2	Analyze the methods to discover Association Rules.	74%	72%
CO3	Design & deploy the appropriate Clustering techniques.	70%	64%
CO4	Outline web mining, temporal and spatial data mining.	64%	60%
CO5	Examine and Explore weka techniques	65%	60%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	Μ	S	Μ
CO2	S	Μ	S	Μ	S	Μ
CO3	S	S	Μ	Μ	Μ	S
CO4	S	S	Μ	Μ	S	S
CO5	S	S	S	Μ	Μ	S

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcomes with Program Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
C O 1	S	Μ	S	Μ	Μ
CO2	S	S	S	Μ	Μ
CO3	Μ	Μ	S	S	S
CO4	S	Μ	S	Μ	L
CO5	S	S	S	Μ	L

(S-Strong, M-Medium, L-Low)

Blooms Taxonomy

	(CA	End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Data Warehousing and Mining

Chapters

UNIT I

INTRODUCTION:

Introduction – Data warehouse – Definition – Data warehouses database – Data warehouse Architecture – Dimensional modeling – OLAP operations – Data Mining – ETL – Cloud Data warehousing-What is Data Mining? Data Mining: Definitions, KDD vs Data Mining, Stages of KDD, DBMS vs DM, Other Related Areas, DM Techniques, Other Mining Problems, Issues and Challenges in DM, DM Application areas.

UNIT II

ASSOCIATION RULES:

What is an Association Rule?, Methods to discover Association Rules, A Priori Algorithm, Partition Algorithm, Pincer Search Algorithm, FP-tree Growth Algorithm, Discussion on different algorithms, Generalized Association Rule.

UNIT III

CLUSTERING TECHNIQUES:

Clustering paradigms, Partitioning Algorithms, k-Medoid Algorithms, CLARA, CLARANS, Hierarchical Clustering, DBSCAN.

UNIT IV

WEB MINING:

Web Mining, Web Content Mining, Web Structure Mining, Web Usage Mining, Text Mining.

TEMPORAL AND SPATIAL DATA MINING:

What is Temporal Data Mining?, Temporal Association Rules, Sequence Mining, The GSP Algorithm, SPIRIT, Spatial Mining, Spatial Mining Tasks, Spatial Clustering, Spatial Trends.

UNIT V

Decision Trees:

Introduction – what is a decision tree? – Tree Construction Principle – Best

 $split-Splitting\ Indexes-Splitting\ criteria-Decision\ tree\ construction\ algorithm-CART-Decision\ tree\ construction\ algorithm-CART-Decision\ tree\ construction\ algorithm-CART-Decision\ tree\ construction\ algorithm-Decision\ algorithm-Deci$

ID3-C4.5.

Text Books:

- 1. Arun K Pujari ,2017 ,"Data mining Techniques", Fourth Edition, Universities Press (India) Private Limited,.
- 2. Witten E. Frank, 4th Edition 2016, "Data Mining Practical Machine Learning Tools & Techniques with java implementation Morgan Kaufmann Publishers.

Units

18 hours

18 hours

18 hours

18 hours

18 hours

Ι	2 (2.11 – 2.3, 2.8, 2.22, 2.23, 2.26,), 3(3.1 – 3.10)
П	4(4.1-4.8, 4.11, 4.14)
III	5(5.1-5.8)
IV	11(11.1, 11.6) 12(12.1-12.5, 12,7, 12.12, 12.13, 12.15, 12.16)
V	6(6.1 - 6.10)

References:

- Jiawei Han, Micheline Kamber, Jian Pei, "Data mining Concepts and Techniques", Third Edition, Morgan Kaufman Publishers, 2012.
- 2. Berson, Alex & Smith, Stephen J: 2012. —Data Warehousing, Data Mining, and OLAPI, TMH Pub. Co. Ltd, New Delhi.

Web Resources

- 1. <u>www.tutorialspoint.com/data_mining</u>
- 2. http://meri.edu.in/meri/wp-content/uploads/2017/01/Mooc-on-Weka.pdf

Course Designers:

- 1. 1.Mrs. J.I Christy Eunaicy
- 2. 2.Mrs. P.Praveena

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course T	ïtle	Category	L	Т	Р	Credit
UIT20CL61	C# usi	ing .Net Lab	CoreLab11	0	0	5	2
	L - Lecture	T - Tutorial	P–Practicals				

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	VI	40	60	100

Preamble

Familiarize with.Net frame work and train to develop console, windows and web applications on C#.NET using Visual Studio IDE.

CourseOutcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficienc	Expected Attainment
CO 1	Explain how to use Visual Studio IDE to develop different types of application such as console applications, windows applications, web applications and soon.	<u>y</u> 75%	75%
CO 2	Describes the C#. Net with Object Oriented View and it's various construct like loops ,decision making, classes and objects	75%	70%
CO 3	Discuss the various tools on window control category 1,category 2 and Category 3 with illustrative applications.	70%	65%
CO 4	Handle file, graphics features of.Net and explain how to create user control.	68%	65%
CO 5	ProjecttheADO.NetArchitecture,it'sadvantagesandexplain thevarious Classes to develop database connected applications.	65%	60%

Mappingof CoswithProgramme SpecificOutcomes

PSO1 PSO2 PSO3 PSO4 PSO5 CO1 S S L L Μ CO2 S S Μ L L CO3 S Μ L М Μ **CO4** Μ S L L L CO5 S Μ L L М

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme

\cap	n t	00	m	00	
U	uι	CU	111	C S	

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	L	L	L	L

CO2	S	Μ	Μ	Μ	Μ	М
CO3	Μ	L	Μ	Μ	Μ	Μ
CO4	S	L	Μ	L	L	Μ
CO5	S	Μ	Μ	Μ	Μ	S

(S – Strong, M – Medium, L – Low)

С	#	Using
.NetLab		

- 1. Develop a Console application to convert the decimal number to binary and vice versa.
- 2. Develop a Console application to display Floyd's triangle with a numeric mode.
- 3. Develop a Console application to print the Pascal's Triangle of a given size.
- 4. Develop a Console application to generate all possible permutations of an array using recursion.
- 5. Develop a Console application to display the pattern like a pyramid using asterisk
- 6. Develop a Console application for Bubble sort.
- 7. Develop a Console application to perform Matrix Addition.
- 8. Createa windows application that allows the user to enter a number in the textbox named
- 9. _getnum'. Check_getnum' is palindrome or not print the result in a label when the user clicks on a button.
- 10. Create a windows application which will ask the user to input his/her name and a message, display the two items concatenated in a label and change the format of the label using radio buttons and check boxes for selection, the user can make the labels' test bold, underlined or italic and change it's color. Include buttons to display the message in the label, clear the textboxes &label & exit.
- 11. Create a windows application which generates Fibonacci series in to a list box.
- 12. Create a windows application to add and delete items to and from the combo box.
- 13. Create a windows application to generate even numbers and odd numbers in separate list boxes.
- 14. Create a windows application for property implementation.
- 15. Create a windows application to set font style and font color using checkboxes and radio buttons.
- 16. Create a windows application to check whether the give number is Armstrong or not.
- 17. Create a windows application to implement a word processor using Rich text box.
- 18. Create a MDI application to generate number of forms at runtime and arrange them using vertical and cascade layout.
- 19. Create a windows application to identify the scrollbar selection and the scrolling position.
- 20. Create a window application To display all the Employee records from the database using SQL source control &bind it to Grid view.
- 21. Create a window Application to Insert records inside the SQL Database table having following fields, Dept_Id, Dept_Name, Emp_Name, Salary. Update

the salary for an employee and perform delete operation on record.

CourseDesigners:

- 1. Mrs.M.Gayathiri
- 2. Mrs. P. Praveena

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course	Course Title	Category	L	Τ	Р	Credit	
UIT20CL62	Mobile Application Development Lab	CoreLab-12	0	0	6	3	

L - Lecture	T - Tutorial	P-Practicals

Year	Semester	Max.	Max.	Total
		Marks CA	Marks SE	
III	VI	40	60	100

Preamble

To develop Mobile application for that uses GUI Components, Fonts, Colors, Layout Managers, Event Listeners and make use of database. Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainmen
			t
CO1	Create the project on Eclipse IDE, Android Studio and	75%	75%
	SDK tools		
CO2	Build an Android application with Fonts, Colors, Layout	70%	60%
	Managers, Event Listeners		
CO3	Connect Database and Maintain data.	70%	60%
CO4	Develop a mobile applications for the end user needs	65%	60%
CO5	Develop a mobile applications using Graphics &	65%	65%
	Multimedia controls		

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	L	S	Μ
CO2	S	S	Μ	L	М	Μ
CO3	S	М	Μ	М	L	L
CO4	Μ	L	L	Μ	L	L
CO5	S	Μ	Μ	Μ	Μ	L

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcomes withProgramSpecificOutcomes

PSO1	PSO2	PSO3	PSO4	PSO5

CO1	S	Μ	S	L	S
CO2	S	Μ	М	М	S
CO3	S	L	М	L	S
CO4	S	М	L	Μ	М
CO5	М	S	М	L	L

(S-Strong, M-Medium, L-Low)

Blooms taxonomy

		End of Semester	
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%

Mobile Application Development Lab

- 1. Develop an application that uses GUI components, Font and Colors.
- 2. Develop an application that uses Layout Managers and event listeners.
- 3. Develop an simple calculator application.
- 4. Write an application that draws basic graphical primitives on the screen.
- 5. Develop an application that makes use of database.
- 6. Develop an application that makes use of RSS Feed.
- 7. Implement an application that implements Multi-threading.
- 8. Develop an application that gives information to the user need.
- 9. Implement an application that writes data to the SD card.
- 10. Implement an application that creates an alert message.

Course Designer:

- 1. Mrs. P. Praveena
- 2. Mrs. M.Gayathiri

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY

(For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Cour Cod	rse le	Course	e Title	Fitle Category		L	Т	Р	Credit
UIT200 (E/F/G	CE41 /H/I)	Aptitude &	Aptitude & Reasoning		Core ctive II	5	-	-	5
		L-Lecture	T-Tutorial		P–P1	actical		S	
Year		Semester		Interna	l Ext	ernal	7	Fotal	
2		IV		25		75		100	

Preamble

Facilitates to solve various quantitative and aptitude problems, along with the verbal, non verbal reasoning and promotes in placement.

Course Outcomes

On the completion of the course the student will be able to

		Expected	Expected
#	Course Out come	Proficiency	Attainment
CO1		76%	73%
	Recall and apply number system, HCF & LCM of Numbers,		
	Averages, Percentage and problems on ages		
CO2	Solve problems Ration & proportion, Time & Work, problems on trains and calendar	76%	73%
CO3	Find the solution of Simple Interest, Compound Interest, Data Interpretation: Tabulation, Bar Graphs, Pie Charts.	72%	68%
CO4	Discuss various Number series- Alpha numeric series- Analogy-coding and decoding techniques and blood relations concept	75%	73%
CO5	Explain the concept of Logic–Statements arguments –Statement assumption - Series: Series–5 figure series-3 and 4 figure series	78%	76%

Mappingof COswithPSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	Μ	Μ
CO2	S	Μ	S	S	L
CO3	S	S	S	М	Μ
CO4	S	S	S	Μ	М
CO5	S	S	S	S	L

Thianaraiar Collo	an Madurai Als	$^{t} \Delta CM = Department$	ont of CA & IT_ Sul	$II_{abus} 2020 \qquad I 124$
i niugurujur Cone	ge, muunnui. 71	ACM - Depuille	$m of CA \alpha m - syl$	100005 2020 L124

S-Strong Mapping of Cos with POs

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	L	L	S	S	L
CO2	S	М	М	М	S	Μ
CO3	S	Μ	L	S	S	Μ
CO4	S	Μ	S	S	L	М
CO5	S	S	S	S	L	S

S-Strong

M-Medium

M-Medium

L-Low

L-Low

Blooms

taxonomy

	CA		End of
	First	Second	Semester
Knowledge	40%	40%	40%
Understand	40%	40%	40%
Apply	20%	20%	20%
Total marks	52	52	140

Conten

Unit I:

Number system, HCF & LCM of Numbers, Averages ,Problems on Ages, Percentage
Unit II: 15 hours

Ratio and Proportion, Time &Work , Problems on Trains, Calendar

Unit III:

Simple Interest, Compound Interest, Data Interpretation: Tabulation, Bar Graphs, Pie Charts.

Unit IV:

15 hours

Series: Series completion–Number series- Alpha numeric series- Analogy-**Coding-Decoding**: Letter coding – Direct letter coding – number / symbol coding–Blood relations.

UnitV:15 hours

Logic: Logic– Statements arguments –Statement assumption- Series: Series–5figure series -3 and4 figure series

Unit	Chapters/Section
Ι	Book 1-1, 2, 6, 8,11
II	Book 1-13,17, 20,27

15 hours

15 hours

III	Book 1-22,23, 36,37,38
IV	Book 2-1,2,4(194-228),5
V	Book 2-Section II-1,2,3
	Part-II-1

extBooks:

- Aggarwal R.S, 2016, Quantitative Aptitude For Competitive Examinations(Fully solved) AsPerNewExaminationPattern7thRevisededition,S.Chand & Company Pvt Ltd, New Delhi.
- 2. Aggarwal R.S, 2015, A Modern Approach To Verbal & Non Verbal Reasoning, S. Chand & Company Pvt.Ltd, NewDelhi.



- 3. AbhijitGuha, 2021, Quantitative Aptitude for Competitive Examinations,5thedition,TataMcGraw–Hill Publications, New Delhi.
- 4. Sijwali BS, Indu Sijwali, 2018, A New Approach to Reasoning Verbal & Non-Verbal Paperback, Arihant Publication
- 4. www.careerbless.com
- 5. https://www.indiabix.com/aptitude/profit-and-loss/
- 6. https://www.handakafunda.com/pipes-and-cisterns-concepts-properties-and-cat-questions/



- 3. Mrs. P. Praveena
- 4. Mrs. M. Gayathiri

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code	Course Title	Category	L	Т	Р	Credit
UIT20SE51(A)/UIT19SE61(A)	Robotics	SEC	2	0	0	2
L - Lecture	T - Tutorial	P– Practicals	5	-		<u> </u>

Year	Semester	Max.	Max. Marks SE	Total
		Marks CA		
III	V/VI	15	35	50

Preamble

To develop an ability to analyze and design the motion for articulated systems and acquire to develop an ability to use software tools for analysis and design of robotic system.

Course Outcome

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Illustrate the basic concepts of robotics and analysis	74%	70%
CO2	Extend the various mathematical applications in	72%	71%
	robotics		
CO3	Discuss the various manipulators in robotics	65%	64%

CO4	Implement the manipulators and its types.	65%	62%

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
C01	S	M	S	L	L	L
CO2	S	L	Μ	Μ	L	L
CO3	Μ	M	S	L	L	L
CO4	Μ	S	L	Μ	Μ	L

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	L	М	М
CO2	М	S	Μ	Μ	L
CO3	S	Μ	L	L	М
CO4	S	S	М	Μ	L

(S - Strong, M - Medium, L - Low)

Blooms taxonomy: Assessment Pattern

	CA		End
	First	Second	ofSemest
			er
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Robotics:

UNIT I:

15 hours

15 hours

Robotic Paradigms : From Tele operation To Autonomy: Overview - How Can a Machine Be Intelligent- What Can Robots Be Used For- Social implications of robotics - A Brief History of Robotics - Industrial manipulators - Space robotics and the AI approach – Tele operation – Tele presence - Semi-autonomous control - The Seven Areas of AI.

The Hierarchical Paradigm: - Overview - Attributes of the Hierarchical Paradigm - Strips -More realistic Strips example - Strips summary - Closed World Assumption and the Frame Problem - Representative Architectures - Nested Hierarchical Controller - Advantages and Disadvantages.

UNIT II:

Biological Foundations of the Reactive Paradigm: Overview - Why explore the biological sciences- Agency and computational theory - What Are Animal Behaviors? - Reflexive behaviors - Coordination and Control of Behaviors -Innate releasing mechanisms - Concurrent behaviors -

Perception in Behaviors - Action-perception cycle - Two functions of perception - Gibson: Ecological approach - Neisser: Two perceptual systems - Schema Theory - Behaviors and schema theory - Principles and Issues in Transferring Insights to Robots.

The Reactive Paradigm : Overview - Attributes of Reactive Paradigm - Characteristics and connotations of reactive behaviors - Advantages of programming by behavior - Representative architectures –Sub sumption Architecture - Example – Sub sumption summary - Potential Fields Methodologies - Visualizing potential fields - Magnitude profiles - Potential fields and perception - Programming a single potential field - Combination of fields and behaviors - Example using one behavior per sensor – P fields compared with sub sumption - Advantages and disadvantages.

Text Book

Introduction to AI Robotics, Robin R. Murphy, A Bradford Book The MIT Press Cambridge, London, 2019.

UNIT	CHAPTER/SECTIONS
Ι	1(1.1 to 1.6), 2(2.1 to 2.5)
II	3(3.1 to 3.6),4(4.1 to 4.4)

Reference Book

1.David Cook,2009,Robot Building For Beginners,Second Edition.

2. www.electronic teacher.com/robotics/robotics-tutorial/robotics-beginners

3.www.instructables.com/simple-robotics-for-beginners

Course Designer :

- 1. Mrs. J.I Christy Eunaicy
- 2. Mrs.M. Gayathiri

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

CourseCode	Course Title		Category	L	Т	Р	Credit
UIT20SEL51(B)/	Multimedia Lab		SEC			2	2
UIT20SEL61(B)							
L	- Lecture	T - Tutorial	P – 1	Practi	cals		

Programme Code – UIT

Year	Semester	Max.	Max.	Total
		Marks CA	Marks SE	
III	V/VI	15	35	50
Preamble				

This lab assignment will provide a brief introduction to desktop publishing software such as Photoshop, CorelDraw, and Flash. Understand the importance of good interface design. This course trains to handle the rich tools in designing software's.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment

CO1	Work in the Photoshop and develop their skills in editing and altering photographs.	85%	80%
CO2	Handle the tool bar, layers, and the adjustments panel in Photoshop.	78%	70%
CO3	Design and produce print material manually using Corel Draw.	68%	60%
CO4	Create and view "multimedia rich" content on the web.	68%	62%

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5
CO1	S	S	Μ	S	L
CO2	Μ	Μ	S	L	М
CO3	S	Μ	Μ	S	L
CO4	S	Μ	Μ	L	М

(S – Strong , M – Medium , L – Low)

Mapping of Course Outcome with Programme Specific Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
C01	Μ	Μ	S	Μ	L	L
CO2	S	L	S	Μ	Μ	Μ
CO3	L	S	S	L	L	M
CO4	Μ	S	L	Μ	Μ	L

(S - Strong, M - Medium, L - Low)

Excercises

Topic	PHOTOSHOP		
1	Mastering the effects of the clone and healing brush tools		
	Understanding and working with Layers and the Adjustments Panel		
	Understanding the basics of Masking		
	Transforming and maximizing Smart Objects		
	Employing Smart Filters to create interesting effects		
	Color correction		
	Working with text and vector shapes		
Topic	COREL DRAW		
2	Design a visiting card		
	Design a postcard		
	Design a poster		
	Design a brochure		
	Design a magazine (at least 16 pages)		
	Prepare a tabloid		
	Prepare a front page of a newspaper		

FLASH
reate an animation to represent the growing moon. reate an animation to indicate a ball bouncing on steps. ovement of a cloud splay the background given (filename: tulip.jpg) through your name. reate an animation with the following features. etters should appear one by one

Course Designer :

- 3. Mr. S. Kumarappan
- 4. Mrs. M. Gayathiri

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code – UIT

Course Code		Course Title		Category	L	Т	P	Credit
UIT20SE	C51(C)/UIT20SE61(C)	Embedded Systems		SBE	2	0	0	2
	L - Lecture	T - Tutorial	P –Prac	ticals				
Year	Semester		Max Marks	. M CA Mar	lax. ks SI	E	Tota	1
III	V/VI		15		35		50	

Preamble

To learn the basic concepts of Embedded Systems and 8051 Microcontroller and the basics of RTOS and to learn the method of designing Real Time Systems.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment	
---	----------------	-------------------------	------------------------	--

CO1	Illustrate the concepts of embedded systems, how to embed Hardware units and Software in a system.	75%	75%
CO2	Describe about various classifications and examples of Embedded Systems.	72%	70%
CO3	Discuss the Real Time Operating System, Multiple Processes and Multiple Threads in an Application.	73%	65%
	Inter Process Communication.		
CO4	Explain Synchronization and RTOS II Operating	68%	62%
	System Services, Process Management and Memory		
	Management.		

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	L	Μ	Μ
CO2	М	S	Μ	Μ	L
CO3	S	Μ	L	L	Μ
CO4	S	S	М	Μ	L

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	Μ	S	L	L	L
CO2	S	L	Μ	М	L	L
CO3	Μ	Μ	S	L	L	L
CO4	Μ	S	L	Μ	Μ	L

(S - Strong, M - Medium, L - Low)

Blooms taxonomy: Assessment

Pattern

	CA		End of
	First	Second	Semester
Knowledge-K1	40%	40%	40%
Understand-K2	40%	40%	40%
Apply-K3	20%	20%	20%
Total marks	52	52	140

Embedded

Systems

UNITI

15 hours

Introduction to Embedded Systems: Embedded Systems- Processor Embedded Into A System-Embedded Hardware Units and Devices in a System-

Embedded Software in a System and an Overview of Programming Languages-Introduction to Embedded System design-Introduction to Embedded System Architecture-Introduction to Embedded System Model-Classification of Embedded Systems – Examples of the Embedded Systems. **8051:** Introduction to Microcontrollers and Microprocessors-Examples of a Microcontroller – 8051Architecture.

UNITII

15 hours

Real – Time Operating System I: Multiple Processes in an Application – Multiple Threads in an Application - Inter Process Communication and Synchronization – Signals – Queues and Mailboxes – Pipe and Socket functions. **Real – Time Operating System II:** Operating System Services–Process Management-Timer Function–Event Function–Memory Management–Device, Files And I/O Subsystem Management–Basic Design using a RTOS.

TextBooks:

Rajkamal, 2015. – Embedded Systems Architecture, Programming And Design ||Tata McGraw-Hill Education Private Ltd, Third Edition.

Units	Chapters
Ι	1 (1.1to 1.8, 1.10), 3 (3.1, 3.3)
II	9(9.1, 9.2, 9.7, 9.8, 9.12, 9.13), 10 (10.1to 10.6, 10.9)

References:

1.MarilynWolf : 2012. -Computers AsA Components I, Third Edition, Morgan Kaufman Series.

2.A.P.Godse&A.O.Mulani:2009. EmbeddedSystems , ThirdEdition, Technical public ations 3.B.KanthRao, 2011:—EmbeddedSystems , PHILearningPrivateLimited.

Web

Resources:

www.tutorialspoint.com

Course Designers:

- 1. Mrs. M.Gayathiri
- 2. Mrs. P.Praveena

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020) Programme Code - UIT

Course Code	Course Title	Category	L	Т	Р	Credit
UIT20SE51/ UIT20SE61 (D)	Cassandra Lab	SBE	0	0	2	2
L - 1	Lecture T - Tutorial	P -	Practi	icals		

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	V/VI	15	35	50

Preamble

Acquiring knowledge to manage & analyze semi-structured, unstructured type of data through Cassandra.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Describe steps to Download install and Cassandra.	75%	75%
CO2	Project the usage of Cassandra query language shell (cqlsh) Commands & Document Shell Commands.	70%	60%
CO3	Implementation of CQL Data Definition Language & Data Manipulation Language Commands.	70%	60%
CO4	Utilization of CQL Clauses & Collections.	65%	60%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	М	L	S	М
CO2	S	S	М	L	Μ	Μ
CO3	S	Μ	Μ	Μ	L	L
CO4	Μ	L	L	Μ	L	L

 $(S-Strong,\,M-Medium,\,L-Low)$

Mapping of Course Outcomes with ProgramSpecificOutcomes

	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	S	М	S	L	S	
CO2	S	М	M	М	S	
CO3	S	L	M	L	S	
CO4	S	М	L	М	М	

 $\overline{(S - Strong, M - Medium, L - Low)}$

Blooms taxonomy

		СА		
	First	Second	Semester	
Knowledge	40%	40%	40%	
Understand	40%	40%	40%	
Apply	20%	20%	20%	
accondra Lab				

- 1. Download and install Cassandra
- Learn all Cassandra query language shell (cqlsh) Commands: cqlsh –help, cqlsh –version, cqlsh –debug, cqlsh –color, cqlsh –execute, cqlsh --file=, cqlsh --no-color, cqlsh -u "user name", cqlsh-p "pass word"
- Learn the following Documented Shell Commands: HELP, CAPTURE, CONSISTENCY, COPY, DESCRIBE, EXPAND, EXIT, PAGING, SHOW, SOURCE, TRACING
- 4. Implement the following CQL Data Definition Commands: CREATE KEYSPACE, USE, ALTER KEYSPACE, DROP KEYSPACE,

CREATE TABLE, ALTER TABLE, DROP TABLE, TRUNCATE, CREATE INDEX, DROP INDEX

5. Implement CQL Data Manipulation Commands:

INSERT, UPDATE, DELETE, BATCH

- Execute CQL Clauses: SELECT, WHERE, ORDERBY
- 7. Create Cassandra Collections:

SET, LIST

References:

- 1. Jeff Carpenter, Eden Hewitt, April 2020, "Cassandra, The Definitve Guide", O'Reilly Media Inc.
- 2. Aaron, TejasMalepati, NishantNeeraj, October 2018, "Mastering Apacahe Cassandra 3.x", Packt.
- 3. Seema Acharya, SubhashiniChellappan, 2018, "Big Data and Anaytics", Wiley India Pvt. Ltd., Ansari Road, Daryaganj, New Delhi.

Web Resources:

- 1. https://www.tutorialspoint.com/cassandra/index.htm
- 2. <u>https://www.guru99.com/cassandra-tutorial.html</u>
- 3. <u>https://www.javatpoint.com/cassandra-tutorial</u>
- 4. https://data-flair.training/blogs/cassandra-crud-operation/
- 5. https://www.oreilly.com/library/view/learning-apache-cassandra/9781771372947/

Course Designers:

- 1. Mrs. P. Praveena
- 2. Mrs. J.I.ChristyEunaicy

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020) Programme Code - UIT

Course Code	Course Title	Category	L	Т	Р	Credit
UIT20SE51/ UIT20SE61 (E)	Hardware Assembling and	SEC	2	0	0	2

	L - Lecture	T - Tutorial	P-	-Practicals	
Year	Semester		Max. Marks	Max. Marks SE	Total
			CA		
III	V/VI		15	35	50
Preamble					

To Solve various issues in hardware and Assembling through trouble shooting while installing various Devices .

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected Proficiency	Expected Attainment
CO1	Understand the basic hardware components	75%	75%
CO2	Knowledge about Mother boards, Storage devices.	72%	70%
CO3	Get knowledge how to troubleshoot problems in CPU.	73%	65%
CO4	Get to Know about hoe to troubleshoot Keyboard, Memory and Pointing devices.	68%	62%

Mapping of Course Outcome with Programme Specific Outcomes

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	Μ	Μ	L	L
CO2	S	S	L	Μ	L
CO3	S	Μ	S	М	L
CO4	S	L	Μ	Μ	S

(S - Strong, M - Medium, L - Low)

Mapping of Course Outcome with Programme Outcomes

		0				
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	М	S	L	L	L
CO2	S	L	Μ	Μ	L	L
CO3	M	М	S	L	L	L
CO4	Μ	S	L	Μ	Μ	L

(S – Strong, M – Medium, L – Low)

Blooms taxonomy:

	CA		End of	
	First	Second	Semester	
Knowledge-K1	40%	40%	40%	
Understand-K2	40%	40%	40%	

Apply-K3	20%	20%	20%
Total marks	52	52	140

Hardware Assembling and Troubleshooting

UNIT I:

15hours

PC Components: Fundamentals of PC Technology - Fundamental Building Blocks of the PC- Principles of CPU Operation. **The Microprocessor:** CPU Operation-CPU Terminology – PC Family Tree - Troubleshooting the CPU. **Memory**: Memory Chips and Modules –Parity Checking and ECC – DRAM Timing and Memory Types – Trouble shooting Memory. **Motherboards**: Motherboard Controllers and System Resources - The I/O System Bus–Chip Sets–RAMBIOS–CMOS setup –Mother board Physical Form Factors.

UNITII:

15hours

Magnetic Storage Devices: Magnetic Storage – The Hard Disk Drives – Floppy Disk Drive – Cartridge Drive. **Optical Storage Devices**: Optical Storage Media-CD-ROM Drive – DVD ROM Drive- Recordable Drives. **I/O Ports and Devices**: Serial Ports – Parallel Ports –UniversalSerialBus.**KeyboardandPointingdevices**:Keyboards– KeyboardTroubleshooting– Pointing Devices–Pointing Devices Trouble shooting.

Text Book

1. CraigZacker, JohnRourke: 2015. - TheCompleteReferencePCHardware II, Tata MCGrawHill EducationPrivateLtd, NewDelhi.

UNIT	Chapter/Section
Ι	1(3-6,25-32),2(43-85),3(97-105,108-114),4(125,138,149-152,158,
	161-170)
II	7(287-314),8(315-336),9(337-357),10(364-370,375,381)
Reference	
Book	

1. Michael Meyers: 2003. –Introduction to PC Hardware and Troubleshooting^{II}, Tata McGrawHill EducationPrivateLtd, NewDelhi.

Course Designer

- 1. Mr. S.Kumarappan
- 2. Mrs. J.I .Christy Eunaicy

Thiagarajar College (Autonomous):: Madurai – 625 009 DEPARTMENT OF COMPUTER APPLICATION & INFORMATION TECHNOLOGY (For those joined B.Sc. IT on or after June 2020)

Programme Code - UIT

Course Code Course Title	Category	L	Т	Р	Credit	
--------------------------	----------	---	---	---	--------	--

UIT20SE51/	R Programming Lab	SBE		2	2
UIT20SE61 (F)					

L - Lecture T - Tutorial P – Practicals

Year	Semester	Max. Marks CA	Max. Marks SE	Total
III	V / VI	15	35	50

Preamble

Getting knowledge to handle, analyze and visualize data using R.

Course Outcomes

On the completion of the course the student will be able to

#	Course Outcome	Expected	Expected
		Proficiency	Attainment
CO1	Show the installation of R	75%	75%
	Programming Environment.		
CO2	Utilization of R Data types for developing programs and make use of different R Data Structures.	70%	60%
CO3	Developing programming logic using R Pack	70%	60%
CO4	Analyzing the data sets using R programming capabilities.	65%	60%

Mapping of Course Outcomes with Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	L	S	М
CO2	S	S	Μ	L	Μ	М
CO3	S	М	Μ	Μ	L	L
CO4	М	L	L	Μ	L	L

(S – Strong, M – Medium, L – Low)

Mapping of Course Outcomes with ProgramSpecificOutcomes

|--|

Thiagarajar College, Madurai. 41st ACM - Department of CA & IT- Syllabus 2020 L142

CO1	S	М	S	L	S
CO2	S	М	М	М	S
CO3	S	L	М	L	S
CO4	S	Μ	L	Μ	Μ

(S - Strong, M - Medium, L - Low)

Blooms taxonomy

		CA End of Semes		
	First	Second	Semester	
Knowledge	40%	40%	40%	
Understand	40%	40%	40%	
Apply	20%	20%	20%	

R Programming Lab

- 1. Download and install R environment and install basic packages using install .packages() command in R.
- 2. Learn Data types, Variables, Operators on R.
- 3. Implement R-Loops with different examples.
- 4. Learn the basics of functions in R and implement with examples.
- 5. Implement data frames in R. Write a program to join columns and rows in a dataframe using cbind() and rbind() in R.
- 6. Implement different String Manipulation functions in R.
- 7. Implement different data structures in R (Vectors, Lists, DataFrames)
- 8. Write a program to read a csv file and analyze the data in the file in R
- 9. Create pie charts and bar charts using R.
- 10. Create a data set and do statistic alanalysis on the data using R.

References:

- 1. Jared P. Lander, 2018, "R for Everyone: Advanced Analytics and Graphics" 2nd Edition, Pearson Education.
- 2. S. R. Mani Sekhar and T. V. Suresh Kumar, 2017, "Programming with R" 1st Edition, CENGAGE.

Web

Resources:

- 1. https://www.r-project.org/
- 2. https://www.tutorialspoint.com/r/index.htm
- 3. https://www.javatpoint.com/r-tutorial
- 4. <u>https://www.guru99.com/r-tutorial.html</u>
- 5. https://www.geeksforgeeks.org/r-tutorial/

Course Designers:

- 1. Mrs. P. Praveena
- 2. Mr. S. Kumarappan