

FORM NO.F/CDD/004 Rev.00 Date 20.03.2020

FACULTY OF COMPUTER APPLICATIONS

LEARNING OUTCOME BASED CURRICULUM

Curriculum and Syllabus

BCA

REGULATION 2022 (for students admitted in the year 2023-24 onwards)

DEPARTMENT OF COMPUTER APPLICATIONS



DECLARATION

I, **Dr.Viji Vinod**, Head of Computer Applications Department, hereby declare that this copy of the syllabus (BCA, Full time 2022 Regulation for students admitted in the year 2023-24 onwards) from page number 1 to 161 is the final version which is being taught in the class and uploaded in our University website. I assure that the Syllabus available in our University website is verified and found correct. The Curriculum and Syllabi have been approved by our Academic Council / Vice Chancellor.

Date:

Signature



VISION / MISSION / QUALITY POLICY

Vision

• To become a leading centre for computer applications, fostering an environment of constant learning and innovation.

Mission

M1:	To create and maintain an environment for the pursuit of academic						
	excellence with the use of computing technology.						
M 2 :	To develop intellectual strength of students and guiding them						
	towards technical, professional and entrepreneurship excellence.						
M 3 :	To nurture analytical skills, inter- personal skills and build higher						
	level of attitude, ethics and confidence.						
M 4 :	To identify areas of cooperation with Industries and Institutions and						
	implement them well within time-frame to mutual advantage and						
	satisfaction.						
M 5 :	Collaborate with industry and other agencies for academic and						
	research programs.						

Quality Policy

• Imparting quality education and achieve academic excellence through planning, leadership, brilliance, inspiration and effectiveness.



PROGRAM EDUCATIONAL OBJECTIVE (PEO)

PEO 1:	To demonstrate a sound knowledge in key areas of Computer Sciences and Industrial Computing
PEO 2:	To demonstrate a substantial understanding of concepts in key areas of Computer Sciences
PEO 3:	To carry out the required analysis and synthesis involved in Computer Systems, Information systems and Computer Applications
PEO 4:	To demonstrate professional competence in developing software and in its design and implementation.
PEO 5:	To develop sound Practical Skills to enable them to addressing problems which arise from Computer systems and Applications

	M 1	M2	M3	M4	M5
PEO 1	3	3	2	3	3
PEO 2	3	3	1	3	3
PEO 3	2	3	2	3	3
PEO 4	2	3	3	3	3
PEO 5	3	3	2	3	3

MAPPING PEO WITH MISSION



FACULTY OF COMPUTER APPLICATIONS <u>PROGRAM OUTCOMES (PO)</u>

PO1:Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

<u>PO2:</u> Communication Skills: : Ability to understand and express thoughts and ideas effectively in writing and orally; and present complex information in a clear and concise manner to different groups.

PO3:Critical and Reflective thinking: Capability to apply analytic thought to analyze and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach. Critical sensibility, with self awareness and reflexivity of both self and society.

<u>PO4:Research-related skills</u>: Ability to recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyze, interpret and draw conclusions from data, ability to plan, execute and report the results of an experiment or investigation.

<u>PO5: Team work and Leadership qualities</u>: Function effectively as an individual, and as a team member or leader in diverse teams, and in multidisciplinary environment.

<u>PO6: Information/digital literacy:</u> Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data and further presentation.

<u>PO7: Multicultural competence and knowledge of heritage:</u> Possess knowledge of the values and beliefs of multiple cultures to effectively engage globally in a multicultural society and interact respectfully with diverse groups. Ability to understand and propagate heritage values.

PO8: Moral and ethical awareness: Ability to embrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.

<u>PO9: Lifelong learning:</u> Ability to update knowledge and skills, participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives.



MAPPING PEO WITH PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
PEO 1	2	3	1	3	2	3	3	2	3
PEO 2	3	3	3	3	3	3	3	3	3
PEO 3	2	3	2	3	2	3	3	2	3
PEO 4	3	3	3	3	3	3	3	3	2
PEO 5	2	3	1	3	2	3	3	2	3

PROGRAM SPECIFIC OBJECTIVES

	Logical and Problem Solving Skills : Ability to analyse the software
PSO 1 :	problem and design, formulate and obtain solution to the problem
	through learning of Mathematical fundamentals to problem solving.
	Project based learning : Ability to develop information and Computing
PSO 2 :	skills through innovative techniques in modern IT environment to
	become an IT Professional or for higher studies.
	Social Responsibility and Environment Awareness : An understanding
PSO 3 :	of computational Professionalism through leadership and team
PSU 5 :	building by means of environmental awareness and social
	responsibility.
PSO 4 :	Business, Entrepreneurial and Industrial Knowledge : Ability to
FSU 4 :	cultivate industrial business through learning of entrepreneurship.

MAPPING PEO WITH PSO

	PSO 1	PSO 2	PSO 3	PSO 4
PEO 1	2	3	1	3
PEO 2	3	3	3	3
PEO 3	2	3	2	3
PEO 4	3	3	3	3
PEO 5	3	3	3	3



BCA Computer Applications (Full Time) Curriculum & Syllabus 2022 Regulations

		I SEMESTER					
S.NO	SUB.CODE	TITLE OF THE SUBJECT	С	L	T/SLR	P/R	Ty/Lb/ETP/I E
1	HBTA22001/ HBHI22001/ HBFR22001	Language : Tamil-I / Hindi-I / French –I	3	3	0/0	0/0	Ту
2	HBEN22001	Language: English – I	3	3	0/0	0/0	Ту
3	HBMA22ID1	Allied -1 : Mathematics I	4	3	1/0	0/0	Ту
4	CBCA22001	Programming In C	3	2	1/0	0/0	Ту
5	HBCC22001	Environmental Studies	3	3	0/0	0/0	Ту
PRAC	TICAL						
6	HBCC22L01	Computer Software Lab	2	0	0/0	4/0	Lb
7	CBCA22L01	Programming in C Laboratory	2	0	0/0	4/0	Lb
8	HBCC22I02	Soft Skill – I	1	0	0/0	2/0	IE
		TOTAL	21				

	II SEMESTER									
S.NO	SUB.CODE	TITLE OF THE SUBJECT	С	L	T/SLR	P/R	Ty/Lb/ETP/IE			
1.	HBTA22002/ HBHI22002/ HBFR22002	Language : Tamil-II/ Hindi-II / French –II	3	3	0/0	0/0	Ту			
2.	HBEN22002	Language : English – II	3	3	0/0	0/0	Ту			
3.	HBMA22ID2	Allied –II : Mathematics II	4	3	1/0	0/0	Ту			
4	CBCA23001	Object Oriented Paradigm and Programming in C++	3	2	1/0	0/0	Ту			
5.	CBCA22003	Multimedia And Animation	4	3	1/0	0/0	Ту			
PRAC	TICAL									
6.	CBCA22L02	Programming in C++ Laboratory	2	0	0/0	4/0	Lb			
7.	CBCA22IL1	Allied – 1 Lab: Multimedia and Animation Lab Using Mathematical Applications	2	0	0/0	4/0	Lb			
8.	HBCC22I03	Soft Skill – II	1	0	0/0	2/0	IE			
		TOTAL	22							



		III SEMESTER					
S.NO	SUB.CODE	TITLE OF THE SUBJECT	C	L	T/SLR	P/R	Ty/Lb/ETP/IE
1.	MBFP22ID1	Allied - III :Financial Accounting	3	2	1/0	0/0	Ту
2.	CBCA22004	Programming in Java	4	3	1/0	0/0	Ту
3.	CBCA22005	Computer Networks	4	4	0/0	0/0	Ту
4.	CBCA22006	Data Structures	3	2	1/0	0/0	Ту
5.	CBCA22007	Software Engineering	3	2	1/0	0/0	Ту
PRAC	TICAL						
6.	CBCA22L03	Programming In Java Laboratory	2	0	0/0	4/0	Lb
7.	CBCA22L07	Data Structures and Algorithm Laboratory	2	0	0/0	4/0	Lb
		TOTAL	21				

		IV SEMESTER							
S.NO	SUB.CODE	TITLE OF THE SUBJECT	C	L	T/SLR	P/R	Ty/Lb/ETP/IE		
1.	CBCA22ID1	Allied - IV: Digital Fundamentals	3	2	1/0	0/0	Ту		
2.	CBCA22008	Visual Programming	4	3	1/0	0/0	Ту		
3.	CBCA22009	Database Management	4	3	1/0	0/0	Ту		
4.	CBCA22016	Distributed Computing	3	3	0/0	0/0	Ту		
5.	CBCA22EXX	Program Elective –I	3	3	0/0	0/0	Ту		
PRAC	TICAL		1	1					
6.	CBCA22L08	Visual Programming Laboratory	2	0	0/0	4/0	Lb		
7.	CBCA22L04	Database Management Laboratory	2	0	0/0	4/0	Lb		
8.	HBFL22IXX	Foreign Language	1	0	0/0	2/0	IE		
	TOTAL 22								



V SEMESTER

S.NO	SUB.CODE	TITLE OF THE SUBJECT	С	L	T/SLR	P/R	Ty/Lb/ETP/IE
1	CBCA22010	Programming in Python	4	3	1/0	0/0	Ту
2	CBCA22EXX	Program Elective –II	3	3	0/0	0/0	Ту
3	CBCA22011	Operating Systems	3	3	0/0	0/0	Ту
4	CBCA22017	Web Programming	4	3	1/0	0/0	Ту
5	HBCC22002	Entrepreneurship Development	3	3	0/0	0/0	Ту
PRAC	TICAL						
6	CBCA22L05	Programming in Python Laboratory	2	0	0/0	4/0	Lb
7	CBCA22L09	Web Programming Laboratory	2	0	0/0	4/0	IE
8	CBCA22I01	Core Skill –I	1	0	0/0	2/0	IE
	TOTAL 22						

		VI SEMESTER					
S.NO	SUB.CODE	TITLE OF THE SUBJECT	С	L	T/SLR	P/R	Ty/Lb/ETP/IE
1	CBCA22EXX	Program Elective –III	3	3	0/0	0/0	Ту
2	CBCA22012	Object Oriented Modeling and Design	4	3	1/0	0/0	Ту
3	CBCA22EXX	Program Elective –IV	3	3	0/0	0/0	Ту
4	HBCC22ET1	Universal Human Values	3	2	0/0	2/0	ETP
PRAC	ГICAL						
4	CBCA22L06	Project Work	9	0	0/0	18/0	Lb
		TOTAL	22				

SUMMARY OF CREDITS :

SEMESTER	CREDIT
1 st Semester	21
^{2nd} Semester	22
3 rd Semester	21
4 th Semester	22
5 th Semester	22
6 th Semester	22
TOTAL	130



Regulation 2022 - 2023 (Optional for Honors Programme)

SEMESTER : 7

Theory:

Course Code	Course Title	С	L	T/SLR	P/R	Ty/Lb/E TP/IE
HBCC22003	Research Methodology	3	2	1/0	0/0	Ту
CBCA22013	Data Visualization	4	3	1/0	0/0	Ту
CBCA22014	Soft Computing	4	3	1/0	0/0	Ту
CBCA22015	Machine Learning	4	3	1/0	0/0	Ту

Practical:

CBCA22I03	Mini Project	2	0	0/0	4/0	IE
CBCA22I04	Internship	1	0	0/0	2/0	IE

Total credits:18

SEMESTER: 8

Theory:

Course Code	Course Title	С	L	T/SLR	P/R	Ty/Lb/E TP/IE
HBCC22004	Startup strategies	3	3	0/0	0/0	Ту
HBCC22005	Principles of Digital Marketing	3	3	0/0	0/0	Ту
HBCC22006	Intellectual Property rights and patents	3	3	0/0	0/0	Ту

Practical:

CBCA22L10	Major Project	6	0	0/0	12/0	Lb
CBCA22I05	Research Publication	2	0	0/0	4/0	IE

Total credits:17

Total no. of credits (I to VIII semesters):165



ELECTIVE LIST

	PROGRAM ELECTIVE-I									
S.NO	Sub.Code	Title of the Subject	C	L	T/SLR	P/R	Ty/Lb/ETP/IE			
1.	CBCA22E01	Data Mining and Ware Housing	3	3	0/0	0/0	Ту			
2.	CBCA22E02	Information Security		3	0/0	0/0	Ту			
3.	CBCA22E03	Professional Ethics	3	3	0/0	0/0	Ту			
4.	CBCA22E04	Software Project Management	3	3	0/0	0/0	Ту			
5.	CBCA22E05	Management Information System	3	3	0/0	0/0	Ту			

	PROGRAM ELECTIVE-II									
S.NO	Sub.Code	Title of the Subject	C	L	T/SLR	P/R	Ty/Lb/ETP/IE			
6.	CBCA22E06	Mobile Computing	3	3	0/0	0/0	Ту			
7.	CBCA22E07	Image Processing	3	3	0/0	0/0	Ту			
8.	CBCA22E08	Cloud Computing	3	3	0/0	0/0	Ту			
9.	CBCA22E09	Open Source Programming		3	0/0	0/0	Ту			
10.	CBCA22E10	Software Testing	3	3	0/0	0/0	Ту			

	PROGRAM ELECTIVE-III								
S.NO	Sub.Code	Title of the Subject	С	L	T/SLR	P/R	Ty/Lb/ETP/IE		
6.	CBCA22E11	Artificial Intelligence	3	3	0/0	0/0	Ту		
7.	CBCA22E12	Design Thinking		3	0/0	0/0	Ту		
8.	CBCA22E13	Block Chain Technology		3	0/0	0/0	Ту		
9.	CBCA22E14	Internet of Things		3	0/0	0/0	Ту		
10.	CBCA22E15	Data Analytics	3	3	0/0	0/0	Ту		



List of OPEN ELECTIVE-2022 Regulations.

For All H&S, Management Studies and Computer application faculties- UG Programmes.

Offering Department	S.NO	Theory/Lab	Subject Code	Subject Name
Mathematics	1.	Theory	HBMA22OE1	Graph Theory
Wathematics	2.	Theory	HBMA22OE2	Optimization Techniques
	3.	Theory	HBPH22OE1	Fundamentals of Optics and Sound
Physics	4.	Theory	HBPH22OE2	Every day Physics
	5.	Lab	HBPH22OL1	Basic Physics lab
	6.	Theory	HBCS22OE1	Office Automation
Computer Science	7.	Theory	HBCS22OE2	Fundamentals of Computer and Internet
	8.	Lab	HBCS22OL1	Multimedia lab
г '	9.	Theory	HBEM22OE1	Indian Economy
Economics	10.	Theory	HBEM22OE2	Gender Economics
	11.	Theory	HBCH22OE1	Chemistry in our Daily Life
Chemistry	12.	Theory	HBCH22OE2	Food Chemistry
	13.	Lab	HBCH22OL1	General Chemistry Lab
English	14.	Theory	HBEN22OE1	English For Media
English	15.	Theory	HBEN22OE2	Creative Writing
	16.	Theory	HBGE22OE1	Disaster Mitigation and Management
Geology	17.	Theory	HBGE22OE2	Remote Sensing and GIS
	18.	Lab	HBGE22OL1	Remote sensing and GIS lab
	19.	Theory	HBPY22OE1	Health & Yoga
Psychology	20.	Theory	HBPY22OE2	Organizational Behavior
	21.	Lab	HBPY22OL1	Understanding Self & Others
	22.	Theory	HBFD22OE1	Applications of Textiles
Fashion Design	23.	Theory	HBFD22OE2	Introduction to Fashion

E	Dr. M.G.R. DUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY University with Graded Autonomy Status	Att Att
	(An ISO 21001 · 2018 Certified Institution)	

(An ISO 21001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.

	24.	Lab	HBFD22OL1	Embroidery Practical Lab
	25.	Theory	CBCA22OE1	•
	23.	Theory	CBCA220EI	Web design
Computer Applications	26.	Theory	CBCA22OE2	E-Commerce
	27.	Lab	CBCA22OL1	Web Designing Laboratory
	28.	Theory	HBFS22OE1	Principles of Nutrition
Food Science Nutrition and Dietetics	29.	Theory	HBFS22OE2	Food Safety and Quality Control
Dietetics	30.	Lab	HBFS22OL1	Community Nutrition Practical
	31.	Theory	HBHM22OE1	Fundamentals of Food Production and Patisserie
Hotel Management and Catering Technology	32.	Theory	HBHM22OE2	Bakery and Confectionery Basics
	33.	Lab	HBHM22OL1	Fundamentals Front office operation practical
Defense and Strategic	34.	Theory	HBDS22OE1	Independent India
Studies	35.	Theory	HBDS22OE2	Human Rights
	36.	Theory	MBFP22OE1	Marketing of Financial Services
Financial Planning	37.	Theory	MBFP22OE2	Business strategy
	38.	Lab	MBFP22OL1	Interview Techniques
Bio Technology	39.	Theory	HBBT22OE1	Food and Nutrition
	40.	Theory	HBBT22OE2	Human Physiology
	41.	Theory	HBBT22OE3	Basic Bioinformatics
	42.	Lab	HBBT22OL1	Basic Bioinformatics Lab
Physical Education and	43.	Theory	HBPE22OE1	Rule of Games and Sports
Sports	44.	Theory	HBPE22OE2	Health and Fitness
	45.	Theory	HBHR22OE1	Workplace Counseling
Human Resource	46.	Theory	HBHR22OE2	Corporate Social
				Responsibility
Information Science and	47.	Theory	HBCF22OE1	Introduction to Data Science
Cyber forensics	48.	Theory	HBCF22OE2	Data Mining
Γ	49.	Theory	HBCF22OE3	Introduction to IoT
F	50.	Theory	HBCF22OE4	Introduction to Big Data
F	51.	Lab	HBCF22OL1	Data Science Lab
	52.	Lab	HBCF22OL2	Data Mining Lab
Management Studies	53.	Theory	MBBA22OE1	Principles of Management and Science
	54.	Theory	MBBA22OE2	Business Ethics



LIST OF FOREIGN LANGUAGES-2022 regulations

S.NO	COURSE CODE	COURSE NAME
1	EBFL22I01/HBFL22I01	French
2	EBFL22I02/ HBFL22I02	German
3	EBFL22I03/ HBFL22I03	Japanese
4	EBFL22I04/ HBFL22I04	Arabic
5	EBFL22I05/ HBFL22I05	Chinese
6	EBFL22I06/HBFL22I06	Russian
7	EBFL22I07/HBFL22I07	Spanish

EDUCATIONAL AND RESEARCH INSTITUTE	Adt NAAC
(An ISO 21001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.	

Table 1:Credit Distribution

S.	Table 1:Credit Distribution		No.of	Credit		Credit	Contact
S. No	CATECODY	Decorintion			Total		
INO	CATEGORY	Description	Courses	s 55	Total 65	Weightage 39%	hours 825
1	CORE COURSES	Core Theory Core Lab	5	10	03	39%	300
			3	10	10	6%	<u> </u>
		Department Core Electives/ Skill	3	10	10	0%	150
2	ELECTIVE COURSES	enhancement					
		electives					
			2	6	8	5%	90
3	OPEN ELECTIVES	Open Elective theory	1	2	0	3%	<u> </u>
		Open Elective Lab	4	12	16	9%	
4	INTERDISCIPLINARY/	Theory			10	9%	180
	ALLIED COURSES	Lab	2	4	20	100/	60
		Language 1 & 2	2	6	32	19%	90
		English 1 & 2	2	6			90
		Soft Skills	4	4			60
	HUMANITIES &	Life Skill					
5	SOCIAL SCIENCES,	Foreign Language	1	1			15
	LIFE SKILLS & SOFT	Environmental	1	3			45
	SKILLS						
		Management Papers	3	9			135
		Entrepreneurship	1	3			45
		Development					
	PROJECTS/INTERNSHIP	Project	3	17	21	13%	165
6	/	Core Skills	2	2			30
Ũ	CORE SKILL	Internship / NSS /	2	2	2		30
		NCC					
7	ENGINEERING						
<i>'</i>	SCIENCES						
		Computer Software	1	2	13	9%	195
		Lab					
		Statistical And	1	2			
		Numerical Methods					
		Lab					
		Critical Thinking	1	1			
8	ANY OTHER	Skill :					
		Universal Human	1	3			
		Values					
		Research	1	3			
		Methodology					
		Research	1	2			
		Publications					
	Total			165	165	100%	2535



 Table 2:

 Revision/modification done in syllabus content:

S.No	Course(Subject) Code	Course (Subject) Name	Concept/ topic if any, removed in current curriculum	Concept/topic added in the new curriculum	% of Revision/ Modification done
1	CBCA22001	Core I – Programming in C	-	Unit 2, 4, 5 Modified from HBCA17G04	40
2	CBCA22002	Core II – Object Oriented Paradigm and Programming in C++	-	Unit 1, 2, 5 Modified from HBCA17G08	40
3	CBCA22007	Core III – Software Engineering	-	Some of the Topics were reduced from all 5 Units.	50
4	CBCA22008	Core IV – Visual Programming	-	Unit 5 Modified from HBCA17G12	10



Table3:

List of New courses/ value added courses//life skills/Electives/interdisciplinary /courses focusing on employability/entrepreneurship/skill development.

S. N o	New courses (Subjects)	Value added courses	Life skill	Electives	Inter Disciplinary	Focus on employability/ entrepreneurs hip/skill
1	Multimedia And Animation	Open Source Programming	Professional Ethics	Data Mining And Ware Housing	Environmental Studies	development. Ncc/Nss/Interns hip
2	Allied – 1 Lab: Multimedia And Animation Lab Using Mathematical Applications	Block Chain Technology	Communication Skill Lab	Information Security	Financial Accounting	Project Work
3	Allied – II Lab : Accounting Laboratory Using Spreadsheet	Data Analytics	Soft Skill – I	Management Information System	Entrepreneurship Development	
4	Programming In Python		Soft Skill – II	Artificial Intelligence	Allied - Iv: Digital Fundamentals	
5	Open Source Technologies		Soft Skill – III	Design Thinking		
6	Programming In Python Laboratory		Critical Thinking Skill	Block Chain Technology		
7	Object Oriented Modeling And Design		Universal Human Values	Internet Of Things		
8	Data Visualization			Data Analytics		
9	Soft Computing					
10	Machine Learning					



Subject Code: HBTA22001	Subject	Name: TA	MIL - I				Ty/Lb/ ETP/IE	Ty/Lb/LT /P/RCETP/IES.Lr						
	Prerequi	site :					Ту	3 0	0	3				
L : Lecture T :	Tutorial SI	r : Superv	vised Learn	ing P: Proj	ject R : Res	earch C : Cre	edits							
T/L/ETL : Theo	•	Embedded	Theory an	d Lab										
OBJECTIVES														
			ectives of te arning Tan		mil.									
					e their infe	riority compl	lex and imp	rove fluen	cy in	the				
			e of spoken						-					
• The rela			guage &cul	ture and the	ne implicati	ons for langu	lage teachii	ng.						
Students compl			e able to											
C01	Tamil stu			gaged in le	arning Tam	il language a	and culture	in a meani	ngful					
	setting													
CO2	Focus on	applying t	the languag	ge in real li	ife situation	s.								
CO3	Use profi	ciency des	scriptors to	motivate l	learners to j	progress to th	ne next stag	e next stage of learning						
CO4	Lessons :	are custom	ized to aro	use studen	ts interest a	and ignite the	iov of lear	ning Tami	llang	uaø				
						Ç				8				
CO5	-				& speaking	skills.								
Mapping of Co						1								
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	09				
CO1	3	3	2	3	2	3	3	3		2				
CO2	2	2	3	2	3	2	2	3		3				
CO3	3	3	2	3	2	3	3	3		2				
CO4	2	2	3	2	2	2	2	3		2				
										3				
CO5	3	3	3	3	3	3	2	2						
							2							
CO5 Cos/PSOs CO1	PS	3 501 3	PS	3 302 3		3 503 3	2	2 PS04 3						
Cos/PSOs	PS	501	PS	502		S03	2	PS04						
Cos/PSOs CO1	PS	3	PS	302 3		S03 3	2	PS04 3						
Cos/PSOs CO1 CO2	PS	501 3 2	PS	3 2		S03 3 3	2	PS04 3 3						
Cos/PSOs CO1 CO2 CO3	PS	501 3 2 3	PS	502 3 2 3		S03 3 3 3	2	PS04 3 3 2						
Cos/PSOs CO1 CO2 CO3 CO4		501 3 2 3 2 3 3	PS	502 3 2 3 2 2 2		S03 3 3 3 3 3		PS04 3 3 3 2 3 3 3						
Cos/PSOs CO1 CO2 CO3 CO4	3/2/1	3 2 3 2 3 2 3 2 3 2 3 . Indicates . gram core	PS	502 3 2 3 2 2 2		S03 3 3 3 3 2		PS04 3 3 3 2 3 3 3		hers				



Subject Code: HBTA22001	Subject Name: TAMIL - I	Ty/Lb/ ETP/IE		T / S.Lr	P/R	С
	Prerequisite :	Ту	3	0	0	3
	Tutorial SLr : Supervised Learning P: Project R : Research C : Cred ry / Lab / Embedded Theory and Lab	its				

முதலாம் ஆண்டு - முதல் பருவம்

கற்றல் நோக்கம்: 1.மாணவர்களின் கவிதை,கட்டுரை எழுதும் திறன் வளர்த்தல் 2. தமிழில் பிழையின்றி பேசும் எழுதும் திறன் வளர்த்தல்

அலகு - 1

அ) மரபுக்கவிதை

11 மணி நேரம்

- 1. செந்தமிழ் நாடு மகாகவி பாரதியார்
- 2.தமிழின் இனிமை, இன்பத்தமிழ், எங்கள் தமிழ், சங்கநாதம் பாரதிதாசன்
- 3.தமிழ் வளர்க்க சபதம் நாமக்கல் கவிஞர் வெ.இராமலிங்கம் பிள்ளை
- 4. கோயில் வழிபாடு, வாழ்க்கைத் தத்துவங்கள் கவிமணி தேசிக விநாயகம் பிள்ளை
- 5.கும்மிப்பாடல் சுத்தானந்த பாரதியார்
- 6. தமிழ்த்தாய் வாழ்த்து மனோன்மணியம் பெ.சுந்தரம் பிள்ளை
- 7.விடுதலை விளைத்த உரிமை கவியரசர் கண்ணதாசன்
- 8. அன்பெனும் பிடியுள்..., முரசறைத்தல் வள்ளலார் இராமலிங்க அடிகள்

ஆ) புதுக்கவிதை

- 1.பாட்டாளிகளின் குரல் பட்டுக்கோட்டை கலியாணசுந்தரம்
- 2. மகாத்மா காந்தியடிகள் கவிஞர் வாலி
- 3. காகிதப் பூக்கள் நா.காமராசு
- 4.வள்ளுவர் வழங்கும் விடுதலை ஈரோடு தமிழன்பன்
- 5. உலகம் வைரமுத்து
- 6. இன்னமுத மாமழை பேரா. முனைவர் பொற்கோ
- 7.தமிழ்ப்பற்று மீரா
- 8.ஐந்தாம் வகுப்பு அபிரிவு நா.முத்துக்குமார்

அலகு - 2

நாட்டுப்புறஇலக்கியம்

1. பொது அறிமுகம்

- 2. நாட்டுப்புற இலக்கிய வகைகள்
- 3.நாட்டுப்புறக்கலைகள்

அலகு - 3

அ) சிறுகதைகள்

- 1. தேங்காய்த் துண்டுகள் (மு.வரதராசனார்)
- 2. அறம் (மாலன்)
- 3. நாற்காலியும் நான்கு தலைமுறைகளும் (திலகவதி)
- 4.அன்னையும் பிதாவும் (இராஜாஜி)
- 5. விடியுமா? (கு.ப.ராஜகோபாலன்)

7 மணி நேரம்

12 மணி நேரம்



ஆ) உரைநடை

- 1. மு.வ. என்னும் மந்திரம் (இரா.மோகன்)
- 2. தமிழிசை இயக்கம் (க.வெள்ளைவாரணனார்)
- 3. மதுரை மாநகரம் (ரா.பி.சேதுப்பிள்ளை)

அலகு - 4

6 மணி நேரம்

9 மணி நேரம்

புதுக்கவிதை - தோற்றமும் வளர்ச்சியும்
 உரைநடை - தோற்றமும் வளர்ச்சியும்
 சிறுகதை - தோற்றமும் வளர்ச்சியும்

அலகு - 5

அ) **இலக்கணம்** 1.

வழக்கு 2. தொகாநிலைத் தொடர் 3. எழுத்துப் போலி 4. பதவியல்

ஆ) மொழிப்பயிற்சி

1. தன்வினை - பிறவினை

- 2. ஒருமை பன்மை மயக்கம்
- 3. பிறமொழிச் சொற்களை நீக்குதல்
- 4. விண்ணப்பம் எழுதுதல்

45 மணிநேரம்



Subject Code: HBHI22001	Subject Name: HINDI -1	Ty/Lb/ ETP/I E	L	T / S.Lr	P/R	C
	Prerequisite : Knowledge of Language	Ту	3	0	0	3
	orial,SLr : Supervised Learning, P: Project, R : R Lab / Embedded Theory and Lab	Research, C : Cr	edits,			
OBJECTIVES						
1. To Understan	nd the Hindi Literature, culture and the usage of l	anguage in the	various	stream	S	
2. To Build up	the Confidence in conversing in Hindi language.					

3. To acquire Knowledge of the usage of Hindi language in the various Government Offices.

		MES (Cos) g this course		to						
CO1		To understa	and the basic	c concepts	and Orig	in of Hindi				
CO2		To know al	out the root	s of Hindi	Literatur	e ands its p	erspective	and method	s.	
CO3		. Elaboratir	ng and under	standing p	hilosoph	ical method	ls of Hindi	Literature.		
CO4		Evaluating Literature	the concept	of Hindi f	rom past	to present a	and to stud	y the society	closely throu	ıgh
CO5		To make the contemporation of the contempora	e students u ary world.	nderstand	the impo	rtance of H	indi in the			
Mapping	of Course	Outcome w	ith Progran	n Outcom	e (POs)					
Sem		Courseco	de: HBH1	22001						
Ι		Program	neOutcom	es(Pos)						
Cos	PO1	PO2	PO3	PO	04	PO5	PO6	PO7	PO8	PO9
CO1	3	2	3		2	3	3	3	3	3
CO2	3	3	3		3	2	3	3	3	2
CO3	3	3	2		3	3	3	3	3	2
CO4	2	3	3		3	3	2	2	3	3
CO5	3	3	3		3	3	2	2	3	3
3/2/1 Indio	cates Strer	ngth Of Co	rrelation, 3	8 – High,	2- Medi	um, 1- Lo	W			
Category		H&S F	Program core	Program Elective	Open elective	Skill enhancing elective	Interdiscipl inary/Allie d	Skill component	Practical Project/ Internship	others
		~								



	(An ISO 21001 : 20 Periyar E.V.R. High Road, Madu	018 Certified Institution) ravoyal, Chennai-95. Tamilnadu, India.					
Subject Code: HBHI22001	Subject Name: HINDI -	1	Ty/L b/ET P/IE	L	T/ S.L r	P/R	С
	Prerequisite : Knowledg	ge of Language	Ту	3	0	0	3
	rial,SLr : Supervised Learn	0		redits,			•
	ab / Embedded Theory and		1 64				
	lerstanding the secret of						
1. Sabhyata kak	ment offices, technical t	erins S	9 Hrs				
2. PersonalApp	•						
3. LeaveLetters	leations						
4. Government	Order						
	e Terminology Hindi to E	English (25 Words)					
	lerstanding the human r		ow the pr	ocedu	res to		
	the bank, technical term		9 Hrs				
1. Mitrata							
2. Letter to the E							
3. Opening anA							
4. Demi Officia							
	e Terminology English to						
	contribution of youth in		-	o and	techni	ical	
things used in memo 1. YuvavonSe)	ý	9 Hrs				
2. Application f	or Withdrowol						
3. Circular	Ji withurawai						
4. Memo							
	e Terminology Hindi to E	English (25 Words)					
	effect of Nuclear energy		l terms in	office	es 9	Hrs	
	rja evam Khadya Padarth						
2. Transfer of an	•						
3. Missing of Pa	ss Book / ChequeLeaf						
4. OfficialMem)						
	e Terminology English to						
	Obstacles faced by the ye			afting			
complaint letters, te		ç	9 Hrs				
	Vyavasay kaChunav						
2. Complaints	N 1 .						
 Ordering for 4. Notification 	JOOKS						
	ng Hindi to English (25 w	vorda)					
5. Official Notif	ig milui to Eligiisii (23 w	-	Total:45 H	Irc			
BOOKS FOR		-	101a1;43 I	119			
REFERENCE:							
1. Prayojan Mo	olakHindi:Dr. Syed Rahan ettah, Chennai – 14	nathulla, PoornimaPraka	ashan 4/7,	Begu	n III		
2.Hindi Gadhya	Mala Dr. Syed Rahamath	ulla, PoornimaPrakasha	n				

2.Hindi Gadhya Mala Dr. Syed Rahamathulla, PoornimaPrakashan 4/7, Begum III Street, Royapettah, Chennai – 14



<i>a i</i>	•• •						45]	hrs		Ι	
Course /s	ubject	Code	HBFR22001	1 56	emester	т	y/Lb/E	L	T/SLr	P/R	C
(Category			All UG Pr	ograms		γ/Lb/L ΓΡ/IE	L	1/51/1	1/K	C
	ourse Title			French	<u> </u>		Ту	3	0	0	3
L : Lecture T	· Tutorial	SI r · Super	vised Learn	ing P. Proje	ct R · Resea	rch C · Crea	lits				
T/L/ETL : Th		-		0 5	et IX . Resea		1113				
OBJECTIV											
1. The stud	lents will ad	cquire a di	fferent persp	pective of th	eir own cult	ture in relati	on to th	e Fre	nch cult	ure	
			vattitudes to		*						
			nse of the F								
			omprehensiv	e view of th	e European	Union and	the men	iber s	states		
COURSE O											
Students com CO1	1 0		anguage froi	m othor Fur	onoon long	uppo and to	chow	nd to	L Franc	awarda	and
COI	expressio		anguage noi	in other cur	opean lang	uage and to	SHOW a			i worus	anu
CO2			language w	orks discove	oring the nr	onunciation					
<u>C02</u>			short dialog		· ·	onunciation	l				
000		-	ct with some		-	tion _what	whore	who	atc		
		•	sons and pla		ie skili ques		where,	who	eit		
CO4		•	nce and its p		utos dovolo	n an idea is	bout th	o imi	ortance	of Eran	co ir
001		ne world aff	•	Shysical this	utes, uever		ibout th	eini	Juitance	UTTAI	ce m
			s in the con	tent of shor	t naragranh	s naintings	etc an	d eve	ervdav co	ntexts	
		-	he culture a				ctc., un	ucvi	li yuu y co	JILCAUS.	
			iglish variou	-			iral evei	nts ai	nd comn	are with	'n
		urrent scen	-	s aspects of				11.5 01	na comp		1
CO5			ugh confide	nce to intro	duce onese	If and ask o	thers sir	nple	question	ns about	,
		•	ails.Interact					•	•	is about	
CO6	-		casual mee	-		-	-		-	as long	as
			hom he/she		-					0	
CO7	-		age can fill a	-	-					ddress e	tc. o
	a hotel re	gistration c	ard /passpo	rt etc.							
Mapping of									(
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P0'	7	PO8	P	09
CO1	3	2	2	2	2	1	2		2		3
CO2	2	2	2	2	1	1	3		2		3
CO3	2	3	2	3	1	1	2		2		3
CO4	3	3	3	2	2	2	2		3		3
CO5	2	2	2	3	3	2	3		2		3
CO6	3	3	2	2	3	3	3		3		3
CO7	3	3	2	2	3	3	3		3		3
atagamı İr			tes Strength						Dec -4:-	- 4	
Category H	H&S	Program core	Program Elective	Open elective	Skill enhancing	Interdisciplina ry/Allied	a Skil compor		Practical Project/		ners
					elective	J	P of		Internshi		

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EDUCATIONAL INSTITUTE AND RESEARC EEMED TO BE UNI University with Graded Autone (An ISO 21001 : 2018 Certified In

			45	hrs		Ι	
Course /subject Code	HBFR22001	Semester					
			Ty/Lb/E	L	T/SLr	P/R	С
Category	All UG	Programs	TP/IE				
Course Title	Fre	nch I	Ту	3	0	0	3
			_				
L : Lecture T : Tutorial SLr : Supe	rvised Learning P: Pr	oject R : Research C : Ci	redits				
T/L/ETL : Theory / Lab / Embedde	ed Theory and Lab	-					
· · · ·	•						

UNIT I

(compréhension Se saluer, La Graphieécrire expression orale, orale)

- Se Présenter-•
- La langue française •
- La Graphie écrire L'alphabet, L'abécédaire •
- Les Accents et les Ponctuations
- L'interaction de base.
 - Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée \geq moins de 2 minutes)
 - Audio clips- For oral expressions, oral assignments and oral test-20 duration less than 2 minutes (10 oral exercises, 6 audio reading compositions& 4 tests).

UNIT II

S'informer-Interactions aidant des Compétences De base

- Des modèles interrogatifs
- Les nombres, demander le cout /le prix
- Demander l'heure, Les jours, Les mois de l'année.
- Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)
- Audio clips- For oral expressions, oral assignments and oral test-20 duration less \geq than 2 minutes (10 oral exercises, 6 audio reading compositions & 4 tests).

UNIT III

Localiser –La France

- Quelque symbole de la France.
- La carte de l'Europe, La France dans le contexte international, La France et les Fuseaux • horaires, La francophonie, L'union Européen
- La France physique, industrielle, touristique rt administrative
- Quelque symbole de Paris.
 - Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)
 - Audio clips- For oral expressions, oral assignments and oral test-20 duration less \geq than 2 minutes (10 oral exercises, 6 audio reading compositions& 4 tests).

UNIT IV

Lire et prononcer Le française

Les son française, les voyelles françaises, les sons nasaux, les consonné, Quelque sons • uniques.

9 Hrs

9 Hrs

9 Hrs



- Les syllabus français, Les Rythme de la langue française.
 - Clip audios : Exercices orales, compositions orales et épreuves orales.(20 –durée moins de 2 minutes)
 - Audio clips- For oral expressions, oral assignments and oral test-20 duration less than 2 minutes (10 oral exercises ,6 audio reading

UNIT V Observer et Comprendre

9 Hrs

- La vie de la France quotidienne, En cas d'urgence.
- La grammaire initiale
 - Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)
 - Audio clips For oral expressions, oral assignments and oral test -20 duration less than 2 minutes (10 oral exercises, 6 audio Reading compositions& 4 tests).

Total:45 Hrs

Reference Books :

1. **Parlez-vous français? Partie 1 -** Dr.M.Chandrika.V.Unni & Mrs. Meena Mathews 2019 by Universal publisher

2. CLE INTERNATIONAL Lectures Clé en français facile. (2012) Hachette Paris

3. **Cosmopolite**: Livre d'élève A1 by Nathalie Hirsch sprung, Tony Tricot, Claude Le Ninan

- 4. Latitudes-1 Régine Mérieux & Yves l'oiseau, Didier 2017
- 5. Alter Ego 1 Catherine Dolez, Sylvie Pons : (2014) Hachette, Paris



HBEN22001	ENGLISH I (Common to all UG Courses under H&S	Ty/Lb /ETP/ IE	L	Т	Р	C
	Total contact hours – 45	Ту	3	0	0	3
	Prerequisite – English Language					
	Course designed by – Department of English					
 Learn vo Demons Develop 	English Language skills (LSRW) to communicate in Englocabulary and syntax to be fluent in English for social and trate content knowledge through appropriate language use in them analytical and interpretative skills for research, p in academic and business writing with a focus on social ar	academic c for acaden rojects, plac	comm nic su	unica ccess nt etc	ation s.	1.
Course Outcom	nes (COs)					
	anguage skills (LSRW) to communicate in English without the appropriate layis and support in English for social and s	•			tion	

- 2. Express with appropriate lexis and syntax in English for social and academic communication
- 3. Demonstrate content knowledge through appropriate language use for academic success.
- 4. Analyse and interpret any genre of literature in English for research, projects, placement etc.,
- 5. Engage themselves in organized academic and business writing with professional ethics.

Program Specific Outcomes (PSOs)

- 1. Demonstrating mastery of the components of English language and literature.
- 2. Explaining through literature in English, diverse historical cultural and social ethics
- 3. Applying literary critical perspectives to generate original analysis of literature in English
- 4. Promoting cultural values and real-life skills through English language and Literature

Mapping of course outcomes (COs) with Program Outcomes (POs)& Program Specific Outcomes (3/2/1 indicates the strength of correlation) 3= High: 2= Medium: 1= Low

(3/2/1 indicates the strength of correlation) 3= High; 2= Medium; 1= Low													
CO	PO	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO	PSO2	PSO	PSO
	1									1		3	4
1	3	3	3	3	3	3	3	1	3	3	3	3	3
2	3	3	3	3	3	3	3	1	3	3	3	3	3
3	3	3	3	3	3	3	3	1	3	3	3	3	3
4	3	3	3	3	3	3	3	1	3	3	3	3	3
5	3	3	3	3	3	3	3	1	3	3	3	3	3
Categor	у	H&S	Progra m core	Progra m Electi ve	Open electiv e	Skill enhan cing electiv e	Interdi sciplin ary/Al lied	Skill compo nent	Practi cal Projec t/ Intern ship		othe	ers	
		\checkmark											



HBEN22001	ENGLISH I (Common to all UG Courses under	Ty/Lb	L	Τ/	P /	С				
	H&S	/ETP/		S.	R					
		IE		Lr						
	Total contact hours – 45	Ту	3	0	0	3				
Course Objectiv	/es:									
The studer	The students will be facilitated to									
1. Develop	English Language skills (LSRW) to communicate in Engli	sh withou	t any	inhił	oition	l.				
2. Learn vo	cabulary and syntax to be fluent in English for social and ad	cademic c	omm	unica	tion					
3. Demonst	rate content knowledge through appropriate language use for	or academ	ic su	ccess						
4. Develop	in them analytical and interpretative skills for research, pro	jects, plac	emer	nt etc.	••					
5. Engage i	n academic and business writing with a focus on social and	professio	nal et	hics.						
Unit I: Prose	-	-	9	Hrs						
1. Beware	the loss of Biodiversity									
2. The Urb	an - Rural Divide									

- 3. Grading down Plastics
- 4. The Unsung Hero of Covid 19 in India
- 5. From Aircrafts to Drones
- 6. My Vision for India

Unit II: Poetry

			9 H IS
1. On Killing a Tree	3.	Anthem for Doomed	Youth
2. The Road Not Taken			
Unit III: Short Story			9 Hrs
1. Portrait of a Lady	2.	The Connoisseur	
Unit IV: Drama			9 Hrs
1. The Never-Never Nest			

2. Frederick Douglass

Unit V: Functional Grammar – Charts & LSRW Development

Functional Grammar: (Grammar exercises spread up in all four units)

 $Parts \ of \ speech-use \ of \ articles- \ prepositions- \ their \ uses- \ verb+ \ prepositions- \ words \ followed \ by \ prepositions- \ modals \ -tenses- \ active \ -passive- \ impersonal \ passive \ forms- \ concord- \ conditional \ sentences- \ question \ tags \ - \ Common \ errors- \ Punctuation$

Vocabulary development- word formation - prefixes-suffixes - synonyms-antonyms - homophones -homonyms - words often confused

Charts/Diagrams and their interpretation - their use

Tables- Flow chart- Pie chart -Bar chart

Letters: Formal and Informal

LSRW Development: audio, video and tasks for the content of lessons under each unit. Total:45 Hrs

Course Outcomes:

On completing the course the students will be able to

- 1. Possess Language skills (LSRW) to communicate in English without any inhibition.
- 2. Express with appropriate lexis and syntax in English for social and academic communication
- 3. Demonstrate content knowledge through appropriate language use for academic success.
- 4. Analyse and interpret any genre of literature in English for research, projects, placement etc.,
- 5. Engage themselves in organized academic and business writing with professional ethics.

PrescribedText:

1. M. Chandrasena Rajeswaran, R. Pushkala & S. Bhuvaneswari, Pinnacle: A Skills Integrated Textbook

2. V. Karpagavadivu, S. Bhuvaneswari, J. Valentina Rani, S. Magdelin Percy, English Workbook **Suggested Reading:** Wren and Martin: Grammar and Composition, Chand & Co, 2006

0 IIma

9 Hrs



Subject HBMA22		Subje	ect Nam	e: ALL	IED –I:]	MATHI	EMAT	TCS-I	Гу/Lb/ЕТ P/IE	Ľ	T/S. Lr	P/R	С
		Prerequisite: Higher Secondary Mathematics							Ту	3	1	0	4
L : Lectu	ıre T	: Tutorial	C: Cr	edits P:	Project								
OBJECT	TIVE	S											
 To To To To 	o unde o unde o unde o unde	erstand the erstand the erstand the erstand the erstand the	Basic co Basic co Basic co Basic co	oncepts in oncepts in oncepts in	n Trigono n Integrat n Probabi	ometry ion lity							
		TCOMES leting this	· /	vere able	to								
CO1	-	-				nk matri	ces an	d Solving	simultar	eous	equati	ions .	
CO2]	 Understand the basic concept of Rank matrices and Solving simultaneous equations . Understand to solve the problem of Expansions of Sin nθ, Cos nθ in powers of Sinθ and Cosθ . Expansions of Sinⁿθ and Cosⁿθ in terms of Sines and Cosines of multiples of θ and also problem in Hyperbolic functions. 											
CO3)) 1	Learn how Integration finding Are	to solve by parts	problem , Defini	te Integra	lls , Prop	perties	of Definit	e Integra	ls and	l Prob	lems o	
CO4]	Understand Baye's The	eorem , l	Random	variable,	Probabil	ity ma	ss functio	n , Proba	bility	densit	ty fun	ction.
CO5		Analyses			2			ponential	, Poisson	and	norma	l distr	ibution
Mapping Cos/POs	-	ourse Out	PO3	-	ram Out	come (P PO6	OS) PO7	PO8	PO9				
C03/1 U3	3		3	3	3	2	107	2	3				
CO2	3		2	3	2	2	1	1	3				
CO3	2	2	3	3	3	2	1	1	2				
CO4	2	2	3	2	3	1	1	2	3				
CO5	3		3	3	3	2	2	2	2				
COs /PSOs		P	SO1		PSO2 PSO3								
C01			3				3				2		
CO2	1		2						ļ		1		
CO3	<u> </u>		3				3				3		
CO4			3						 		2		
CO5		2/7	$\frac{3}{1 \text{ Indica}}$	tes Stron	gth Of Co		$\frac{2}{n^{2}-1}$	High 2	Medium	1_	2		
		5/2/	1 mulca	ics stiel		Low	n, <u>э</u> – .	111g11, 2-1	vicululli,	1-			
Category H	I&S	Progra		Program Elective	Open elective	Open Skill Interdiscipl							others
								V					

Subject Code: Subject Name: ALLIED -I: MATHEMATICS-I Tv/Lb/ETL T/S. P/R HBMA22ID1 P/IE Ĺr **Prerequisite: Higher Secondary Mathematics** 3 1 0 4 Ty

Course Outcomes:

To understand the Basic concepts in Matrices

To understand the Basic concepts in Trigonometry

To understand the Basic concepts in Integration

To understand the Basic concepts in Probability

To understand the Basic concepts in Standard Distributions

UNIT I MATRICES

Elementary operations on Matrices - Rank of a Matrix - Solving simultaneous equations (atmost three equations with three unknowns).

UNIT II TRIGONOMETRY

Expansions of Sin n θ , Cos n θ in powers of Sin θ and Cos θ – Expansion of Tan n θ – Expansions of Sinⁿ θ and Cosⁿ θ in terms of Sines and Cosines of multiples of θ – Hyperbolic functions – Separation into real and imaginary parts.

UNIT III INTEGRATION

concepts of Integration – Methods of Integration – Integration by substitution – Integration by parts –Definite Integrals - Properties of Definite Integrals - Problems on finding Area using single integrals (simple problems).

INTRODUCTION TO PROBABILITY UNIT IV Axioms of Probability – Conditional probability – Total probability – Baye's Theorem – Random variable – Probability mass function – Probability density function – Properties (Definition and simple problems).

UNIT V STANDARD DISTRIBUTIONS

Binomial - Poisson - Exponential - Normal distributions.

Reference Books:

- 1) Vittal.P.R, Allied Mathematics, Margham Publications., Chennai, (2012).
- 2) Venkatachalapathy.S.G, Allied Mathematics, Margham Publications., Chennai, (2007).
- 3) Singaravelu, Allied Mathematics, Meenakshi Agency., Chennai, (2001).
- 4) Gupta S.C., Kapoor V.K., Fundamentals of Mathematical Statistics, S.Chand& Co., (2007).

5) Vittal.P.R, Malini, Statistical & Numerical Methods, Margham Publications., Chennai, (2012).

(12 hrs)

(12 hrs)

(12 hrs) Basic

(12 hrs)

(12 hrs)

Total no. of hrs: 60





Subject Code: CBCA22001	Subject N	lame: PRC	OGRAMM		Ty/Lb/E TP/IE	L T / S.Lr	P/R	C					
	Prerequis	ite : Rudiı	nentary sl	kill in Basi	c Program	ming	Ту	2 1	0	3			
L : Lecture T :					ct R : Rese	arch C : Cre	dits	•	•				
T/L/ETL : The		mbedded '	Theory and	l Lab									
OBJECTIVE													
	art the basic												
-	e the concep												
	ionstrate an u		-			-							
	lerstand and		mmon data	structures	typically fo	und in C pr	ograms —	namely arr	ays,				
	es and point		_										
	erstand the c		pointers an	d operation	is on files.								
COURSE OU		· /	11 .										
Students comp CO1					uda 0- idana	: f :		-1 dotota					
COI		Understand the fundamentals of c – keywords & identifiers, constants, variables, datatypes,											
CO2		spressions, operators and mathematical functions.											
02		Develop readable C programs with branching and looping statements, which uses Arithmetic, logical, Relational or Bitwise operators											
CO3	Understand how to write and use functions, how the stack is used to implement function calls, and												
		parameter passing options. Also to explore on storage classes.											
CO4	Able to de	fine arravs	and use th	nem in sim	ole data pro	cessing apr	lications. a	lso he/she	must h	be la			
			pt of array										
CO5						s and its de	claration. A	lso knowi	ng the				
	tactics of i				Ĩ				C				
Mapping of C	Course Outc	ome with]	Program (Outcome (1	POs)								
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	09			
CO1	3	2	3	3	2	2	3	2		2			
CO2	2	2	3	2	3	3	2	3		3			
CO3	3	2	2	1	3	3	1	3		3			
CO4	3	3	3	2	1	3	2	1		3			
CO5	2	3	2	3	3	3	3	3		3			
Cos/PSOs	PS	501	Р	S02	P	S03	PS04						
C01		3		3		2		2					
CO2		2		2		1		3					
CO3		3		3		3		2					
CO4		3		3		2		3					
CO5		3		2		2		3					
	3/2/1	Indicates	Strength C	of Correlati	on, 3 – Hig	h, 2- Mediu	m, 1- Low						
Category	H&S Pi	ogram core	Program	Open	Skill	Interdisciplin		others	ners				
			Elective	elective	enhancing elective	ary/Allied	component	Project/ Internship					
								memsinp					
		,											

TEXT BOOK:

UNIT IV

Subject Code:

CBCA22001

1. Balaguruswamy, E(2012), Programming in C(6th ed.), Tata McGraw-Hill Publishing Company Limited.

REFERENCES:

- 1. Byron Gottfried & Jitender Chhabra(2010), Programming with C (Schaum's Outlines Series), McGraw Hill Education.
- 2. K N King(2008), C Programming(2nd ed..), W. Norton & Company

UNIT V

Automatic, External, Static and Register Variables.

Arrays, Structures and Pointers : Arrays : One dimensional array-two dimensional array - Character arrays - Strings

- String handling functions. Structure : Defining and declaration of structures - Accessing structure members - Unions.

C fundamentals: Character set - keywords and Identifiers - constants - Variables - Declarations of variables - Data types – Expressions - Operators: Arithmetic-Relational-logical- Assignment- Increment and Decrement- Conditional – Bitwise - Special operators - Mathematical functions.

I/O Statements, Control Statements : I/O Statements : Single Char, String, Formatted I/O Statements. Conditional Control Statements : Decision making : Simple if- if...else- nested if..else. Looping: while, do- while, for loop -Uncontrol Control Statements: goto, break, continue. Multiple Branching Statement : Switch - case

UNIT III 9 Hrs Functions: Definition –function declaration- function call - Passing arguments – Recursion - Storage Classes:

Pointers, Files : Pointers - Declarations - Accessing a variable through its pointer-Pointer and Arrays. Files: Types of files - Opening and closing a file - Input/ Output operations on files.

UNIT II 9 Hrs

UNIT I 9 Hrs

2 Prerequisite : Rudimentary skill in Basic Programming Ty 1 L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

u. India Subject Name: PROGRAMMIMG IN C Tv/Lb/E

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TP/IE

9 Hrs

Total No of Hrs: 45

9 Hrs



Subject (HBCC220		Subject	Name :]	ENVIR	ONME	ł	Fy/L D/ET P/IE	LI	C P	С		
		Prerequi	site : Noi	ne					Ту	3 0	0	3
L : Lectur	e T : Tutori	al P:Pro	ject C: (Credits						I		
OBJECT • T	TVES : o acquire kr	nowledge o	of the Env	vironme	nt and E	cosyste	n & Bio	odiversity				
• T	o acquire kr	nowledge o	of the diff	erent ty	pes of E	nvironn	nental po	ollution				
• T	o know moi	e about Na	atural Res	sources	and soci	al issue	s and the	e Environ	ment			
• T	o attain fam	iliarity of l	numan po	pulation	n and Er	nvironm	ent					
	E OUTCON completing t	the course	were able									
CO1	To known	about Env	ironment	and Eco	osystem	& Biod	iversity					
CO2	To clearly manageme								luclear l	Pollution	s and Sol	id Waste
CO3	To know global wa	rming, ac	id rain, c	ozone la	iyer dep	oletion	etc., and					change,
Mapping	of Course	Outcomes	with Pro	ogram (Dutcom	es (POs)					
COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PSO2	PSO3
CO1	2	1	1	1	2	1	1	3	2	1	1	3
CO2	2	1	1	1	2	1	1	3	2	1	1	3
CO3	2	1	1	1	2	1	1	3	2	1	1	3
Category	H&S	Program core	Progra Electiv	m ve e	Open elective	Skil enhanc electi	ing in	terdiscipl ary/Allie d	Skill compon t	en F	ractical Project/ ternship	others

HBCC22001 b/ET P/IE Prerequisite : None Ty 3 0 0 L: Lecture T: Tutorial P: Project C: Credits 9 Hrs

Subject Name : ENVIRONMENTAL STUDIES

UNIT I ENVIRONMENT AND ECOSYSTEMS

Definition, scope and importance of environment - need for public awareness - concept, structure and function of an ecosystem - producers, consumers and decomposers - energy flow in the ecosystem. Biodiversity at National and local levels - India

UNIT II ENVIRONMENTAL POLLUTION

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Nuclear hazards (g) E-Wastes and causes, effects and control measures

UNIT III NATURAL RESOURCES

Subject Code :

Forest resources: Use and over-exploitation, deforestation. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

From unsustainable to sustainable development - urban problems related to energy - water conservation, rain water harvesting, watershed management - resettlement and rehabilitation of people; its problems and concerns climate change, global warming, acid rain, ozone layer depletion, nuclear accidents ,central and state pollution control boards- Public awareness.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations - population explosion, environment and human health - human rights - value education - HIV / AIDS - women and child welfare - role of information technology in environment and human health

TEXT BOOKS:

- 1. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education (2004).
- 2. Benny Joseph, 'Environmental Science and Engineering', Tata McGrawHill, NewDelhi, (2006).

Total no of Hours : 45

9 Hrs

9 Hrs

С

3

Ty/L

L

Т

Р

9 Hrs

9 Hrs





Subject Code: HBCC22L01	Subjec	ct Name : C	COMPUT	ER SOFT	LAB	Ty/Lb/E TP/IE	L	T / S.L		?/R	C		
	Prereq	uisite: NIL				Lb	0	()	4	2		
L : Lecture T : T					: Project	R : Research	n C: Credits						
Ty/Lb/ETL : The		/Embedded	Theory an	nd Lab									
OBJECTIVES :		1 <u>4</u>	MC Office				1				1:4		
						n office wor metic operat				onai-qua	inty		
						r plots, and							
				-		, Powerpoin							
COURSE OUT	Ŭ	<u> </u>		115 01 000		, i owerpoin	t, I annt and	meme					
CO1		. , , ,	,	arious op	erations ir	MS Word							
CO2						both manual	lly inputting	g formul	as and	built-in f	funct	ions.	
CO3		op dynamic				nation, narra							
CO4		To create drawings to include clipart, color, shape, size, text, enhance text											
CO5						sending ma							
Mapping of Cou													
COs/POs	PO1	PO2	PO3	PO4		PO5	PO6		PO7	PO8	P	PO9	
CO1	3	3	1	2		1	2		3	2		2	
CO2	3	2	3	2		2	2		3	2		3	
CO3	3	3	1	2		1	2		3	2		2	
CO4	3	2	1	1		1	2		2	2		2	
CO5	3	3	1	1		1	2		3	2		3	
COs / PSOs		PSO1			P	SO2			Р	SO3			
CO1		3					1						
CO2		3					2						
CO3		2							1				
CO4		3					1						
CO5		3				1				1			
3/2/1 indicates S					Medium,		(-		
Category	H&S	Program core	Program Elective	Open electiv e	Skill enhancin g elective	Interdisciplir ied	-	Skill omponen	t I	Practical Project/ ternship	0	thers	
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Subject Code: HBCC22L01	Subject Name : COMPUTER SOFTWARE LAB	Ty/Lb/E TP/IE	L	T / S.Lr	P/R	С
	Prerequisite: NIL	Lb	0	0	4	2
	utorial S.Lr : Supervised Learning P : Project R : Research eory/Lab/Embedded Theory and Lab	n C: Credits				

(MS office-Word, Excel, Powerpoint, Paint and Internet)

- UNIT 1: OFFICE APPLICATIONS I
- MS OFFICE: MS-WORD UNIT 2: OFFICE APPLICATIONS - II

MS OFFICE: MS-EXCEL

- UNIT 3: OFFICE APPLICATIONS III MS OFFICE: MS-POWER POINT
- UNIT 4: MICROSOFT PAINT EXERCISES IV
- UNIT 5: INTERNET & ITS APPLICATIONS- V

Total Hrs needed to complete the lab: 60



OFFICE APPLICATIONS – I

- 1. Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
- Preparing a news letter: To prepare a newsletter with borders, two columns text, header and footer and inserting a graphic image and page layout.
- Creating and using styles and templates To create a style and apply that style in a document To create a template for the styles created and assemble the styles for the template.
- Creating and editing the table
 To create a table using table menu
 To create a monthly calendar using cell editing operations like inserting, joining, deleting, splitting and merging cells
 To create a simple statement for math calculations viz. Totalling the column.
- 5. Creating numbered lists and bulleted lists To create numbered list with different formats (with numbers, alphabets, roman letters)To create a bulleted list with different bullet characters.
- 6. Printing envelopes and mail merge.
 To print envelopes with from addresses and to addresses
 To use mail merge facility for sending a circular letter to many persons To use mail merge facility for printing mailing labels.
- Using the special features of wordTo find and replace the text To spell check and correct. To generate table of contents for a documentTo prepare index for a document.
- 8. Create an advertisementPrepare a resume.

OFFICE APPLICATIONS – II

- 9. Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branchoffices (Showing Total Sales, Average Sales).
 Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula toget Distinction, A Grade, B Grade, C Grade and Fail under Result column against each student).
- Operating on the sheets: Finding, deleting and adding records, formatting columns, row height, merging, splittingcolumns etc. Connecting the Worksheets and enter the data.
- 11. Creating a Chart: To create a chart for comparing the monthly sales of a company in different branch offices.
- Using the data consolidate command: To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amountbudgeted for – say, department office expenses.
- 13. Sorting Data, Filtering Data and creation of Pivot tables.



OFFICE APPLICATIONS – III

- 14. Creating a new Presentation based on a template using Auto content wizard, design templateand Plain blank presentation.
- 15. Creating a Presentation with Slide Transition Automatic and Manual with different effects.
- Creating a Presentation applying Custom Animation effects –
 Applying multiple effects to the same object and changing to a different effect and removing effects.
- 17. Creating and Printing handouts.

OFFICE APPLICATIONS – IV

- 18. To show your understanding of Microsoft Paint, label the drawing with the following labels: zoom tool, eraser, line thickness, example clipart, arrow shape, line tool, get more colors, add text, document title, save icon, undo, select, rotate, icon, fill, freehand tool, copy, color 2. You only need to use each label once.
- 19. Microsoft Paint Exercise
 - A. Create a logo for a business.

B. Examples: for a computer shop, a greengrocer, a garage, an education centre, a restaurant, a sports club, or anything you choose!

C. Get ideas by looking at other business/popular logos.

- D. You can insert clipart.
- E. Save your drawing as Logo.

F. Print your logo. Use Page Setup to fit your logo to the page.

*Ensure your logo represents the business and contains some text.

OFFICE APPLICATIONS - V

- 1. Searching for a web site / application / text documents viewing and downloading.
- 2. Create an E-mail account, Retrieving messages from inbox, replying, attaching files filteringand forwarding
- 3. Operating on a Tablet / Smart Phone browsing and practising on some important applications (UcBrowser, Skype) operating on internet creating and sending messages / mails using the applications like WhatsApp and WeChat downloading text and media filesand video conferencing using Skype.



Subject Code: CBCA22L01	Subject	Name: PR O	GRAMM	IMG IN C	LABORA	ATORY	Ty/Lb /ETP/ IE	/ETP/ L S.Lr IE					
		isite : Rudi	mentary s	kill in Basi	ic Program	nming	Lb	0	0	4	2		
T T / 7	Knowle		· 11	·		100	1.						
L : Lecture T T/L/ETL : Th					ect R : Rese	earch C: Cre	edits						
			Theory an	lu Lau									
OBJECTIV		<u> </u>											
	-	-	-			rogramming							
			d design th	he algorithr	n using var	ious algorith	im design t	ech	niques t	o che	ck		
	lindrome ar	•		1		1 1							
		naracterize v											
						ns in a self-			1	· C'1			
	-	sional ethics	s and appro	opriate data	location of	an address	memory ar	nd le	earn abo	ut file)		
proces		$\mathbf{C}(\mathbf{C},\mathbf{z})$											
COURSE O Students com			a abla ta										
CO1				ling Biggos	t number o	mong three	numbore of	ad a	leo find	wootl	hor		
cor		number is p			a number a	mong unee	numbers ai	iu a	iso iiiu	weati	101		
CO2					actors which	h reads the s	ama hacku	vord	96				
002						or of given t			as				
CO3						h each num			numbe	r) is t	the		
000		·				types of mat			numbe	1) 13 (
CO4						e c features			for facto	rial a	nd		
		arksheet usi											
CO5					ointers and	file operation	ons in vario	ous s	sectors.				
Mapping of						1							
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	PO	9		
CO1	3	2	3	3	2	3	3		2	3	;		
CO2	2	2	3	1	2	3	1		2	3	;		
CO3	3	2	2	1	3	3	1		3	3	;		
CO4	3	3	3	2	1	3	2		1	3			
CO5	2	3	2	3	3	3	3		3	3	;		
Cos/PSOs	I	PS01	P	S02	P	S03		F	PS04				
CO1		3		3		2			2				
CO2		2		2		1			3				
CO3		3		3		3			2				
CO4		3		3		2			3				
CO5		3		2		2			3				
	3/2	/1 Indicates	Strength O	f Correlation	on, 3 – Higl	h, 2- Mediur	n, 1- Low						
Category	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	F	ractical Project/ ternship	oth	ers		
								1					



Subject	Subject Name: PROGRAMMIMG IN C LABORATORY	Ty/Lb		Τ/	P/R	С
Code:		/ETP/	L	S.Lr		
CBCA22L01		IE				
	Prerequisite : Rudimentary skill in Basic Programming	Lb	0	0	4	2
	Knowledge					
	Tutorial SLr : Supervised Learning P: Project R : Research C : Credi	ts				
T/L/ETL : The	ory / Lab / Embedded Theory and Lab					

Write a C program for the following:

- 1. Finding Biggest number among three numbers
- 2. Finding whether the given number is prime or not
- 3. Reverse a string and check for palindrome
- 4. GCD of two numbers
- 5. Fibonacci series
- 6. Matrix Operations
- 7. Factorial using Recursion
- 8. Prepare student mark sheet using structures
- 9. Swapping using Pointers
- 10. File Operations

Total Hrs needed to complete the lab: 60



Subject Code:	Subject N	ame: SOF	T S <mark>KILL</mark>	-I			T/L/	L	T/	P/R	C					
HBCC22I02	D · · ·		1 7					ETL S.Lr IE 0 0 2 1								
111111111111111111111111111111111111111	Prerequisi	te : Englis	h Languag	ge			IE									
L : Lecture T :					ct R : Rese	arch C : Cre	dits		-							
T/L/ETL : The	ory / Lab / E	Embedded	Theory and	d Lab												
OBJECTIVE	S															
						ation for eff	ective tea	m b	uilding.							
	o assertive a															
	peer intera															
						professiona			ts							
5. Use sof			s of researc	ch and follo	ow ethics in	society and	professio	on.								
COURSE OU Students comp			abla to													
CO1				ogged in ir	teractive c	ommunicatio	on for eff	ectiv	ve team	buildi	nσ					
CO2					to be leader				ve team	ounun	<u>115</u> .					
	Ť.		•													
CO3					ifelong lear	0										
CO4	Learn skill	s necessary	y for a coo	perative liv	ing in acad	emic and pr	ofessiona	l en	vironme	ents						
CO5	Use soft sk	cills for the	purposes	of research	and follow	ethics in so	ciety and	pro	fession	l						
Mapping of C	ourse Outc	ome with]	Program	Outcome ()	POs)											
PSO1						language and										
PSO2	Explaining	through lit	erature in	English, di	verse histor	ical cultural	and socia	al et	hics							
PSO3		-		-	-	inal analysis				sh						
PSO4	Ŷ				Ų	English langu	•	Lite	rature							
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	09					
CO1	3	3	3	1	2	3	2		2		3					
CO2	3	3	3	1	2	3	2		2		3					
CO3	3	3	3	1	2	3	2		3		3					
CO4	3	3	3	3	3	3	2		3		3					
CO5	3	3	3	3	3	3	2		3		3					
Cos/PSOs	PS	01	P	S02	P	S03			PS04							
CO1	3	3		2		2			2							
CO2	2	2		2		2			2							
CO3	3	3		2		2	2								2	
CO4	3	3		2		2			2							
CO5	3	3		2		2			2							
	3/2/1	Indicates	Strength C	Of Correlati	on, 3 – Hig	h, 2- Mediu	n, 1- Lov	V								
ategory H	I&S Pr	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill componen	t l	Practical Project/ nternship	oth	hers					
											-					



Subject	Subject Name: SOFT SKILL-I	T/L/	L	Τ/	P/R	С
Code:		ETL		S.Lr		
HBCC22I02	Prerequisite : English Language	IE	0	0	2	1
L : Lecture T :	Tutorial SLr : Supervised Learning P: Project R : Research C : Credits					
T/L/ETL : The	bry / Lab / Embedded Theory and Lab					

Prefatory Note

This paper aims to equip students with skills essential for work place and global environment to which they will move on from the university, once they complete the course. As such, this paper provides students with a set of ten interlinked soft skills: Listening, team work, emotional intelligence, assertiveness, learning to learn, problem solving, attending interviews, adaptability, non-verbal communication and written communication. Students will get engaged in pair work, group work, role play, discussion, presentation, story telling, writing assignments etc.,

Course Objective

The students will be facilitated to

- 1. Become good listeners to get engaged in interactive communication for effective team building.
- 2. Develop assertive and adaptive behaviour to be leaders
- 3. Develop peer interaction for a successful lifelong learning.
- 4. Learn to learn skills necessary for a cooperative living in academic and professional environments
- 5. Use soft skills for the purposes of research and follow ethics in society and profession.

Unit -I

Listening, Speaking, Reading and Writing skills (LSRW)

Unit -II

Team work skills: adaptability, emotional intelligence, learning skills

Unit -III

Leadership Qualities: assertiveness, reasoning, compassion and compatibility

Unit -IV

Problem solving: willingness to learn, creative thinking, developing observation skills

Unit -V

Interview skills: employability skills, resume writing

Course outcome

On completion of the course the students will

- 1. Become good listeners to get engaged in interactive communication for effective team building.
- 2. Develop assertive and adaptive behaviour to be leaders
- 3. Develop peer interaction for a successful lifelong learning.
- 4. Learn skills necessary for a cooperative living in academic and professional environments
- 5. Use soft skills for the purposes of research and follow ethics in society and profession.

Suggested reading

S.P. Dhanavel, English and Soft Skills, Vol. 1, Orient Blackswan Pvt. Ltd. 2010

EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY University with Graded Autonomy Status	Att Share
(An ISO 21001 : 2018 Certified Institution)	

Subject Code:	Subject	Name: TAN		a Road, Maduravoyal	, citerinar- 55, Tanin		Ty/Lb/E TP/IE	L T/ S.L	P/R	C	
HBTA22002	Prerequi	site :					Ту	3 0	0	3	
L : Lecture T :	•		sed Learn	ing P: Proje	ct R : Rese	arch C : Cre	•				
T/L/ETL : The		·		0 0							
OBJECTIVE	S										
	-					-	opportunitie				
							earn significa		oken sk	till.1	
	-	er countries				-	uage teachin	g			
COURSE OU				leting this co	ourse were	able to					
CO1	Strength	en literacy sk	ills								
CO2	Engage ii	n learning Tai	nil languag	e and culture	e in a meani	ngful setting					
CO3	Engross i	n independer	nt and life-l	ong learning							
CO4	Develop	a strong foun	dation in li	stening & spe	eaking skills.						
CO5	Arouse s	students inte	rest and igr	nite the joy o	f learning Ta	amil language					
Mapping of C	ourse Out	tcome with	Program	Outcome (l	POs)						
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P)9	
CO1	3	3	2	3	2	3	3	3		2	
CO2	2	2	3	2	3	2	2	3		3	
CO3	3	3	2	3	2	3	3	3		2	
CO4	2	2	3	2	2	2	2	3		2	
CO5	3	3	3	3	3	3	2	2		3	
Cos/PSOs	F	PS01	I	PS02	P	S03		PS04		-	
CO1		3		3		3		3			
CO2		2		2		3		3			
CO3		3		3		3		3			
CO4		2 2			3	3					
CO5		3		3		3	2				
	3/2	/1 Indicates	Strength (Of Correlation	on, 3 – Hig	h, 2- Mediu	um, 1- Low				
Category	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplinar y/Allied	Skill component Project/ other Internship				
	\checkmark										



Subject Code:	Subject Name: TAMIL - II		Ty/Lb/E TP/IE	L	T / S.Lr	P/R
HBTA22002	Prerequisite :		Ту	3	0	0
	Tutorial SLr : Supervised Learning P: Project 1 ory / Lab / Embedded Theory and Lab	R : Research C : Credit	8			
கற்றல் நே செய்தல்	முதலாம் ஆண்டு - இரண்டா ாக்கம்: 1.தமிழர் பண்பாட்டினை அ	ம்பரவும் றியச்				
2. கடிதா 3.தமிழ் அறிதல்	ம் எழுதும் திறன் வளர்த்தல் இலக்கிய வரலாற்றினை)					
அலகு - 1 ச	ங்க இலக்கியம்	9 மணி நேரம்				
	ாறு - பா.எண் - 183,184,192					
	5ாகை - பா. எண் 2,40,167					
3. நெடுநல வரை	வாடை - 1 முதல் 44 வரிகள்					
	ாகை - பா.எண் 102,133					
എ ഡக്ര - 2		9 மணி நேரம்				
	கொரம் - வழக்கு உரை காதை					
முழுவதும்						
அலகு - 3 ந	நீதி இலக்கியம்	9 மணி நேரம்				
1.திருக்குற) oft - 34,72,96,102,103,116,124,136,158,395 (1	0 குறள்கள்)				
	Τヴ - 1,11,29,32,43,51,74,103,116,135(10 山田	டல்கள்)				
U	கோவை - 20,23,25,76,96 (5					
பாடல்கள்						
4.தாராகருச பாடல்கள்	5in - 7,12,27,31,38,(5					
	[்] தமிழ் இலக்கிய வரலாறு	9 மணி நேரம்				
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	இலக்கணம்	9 மணி நேரப்	נ			
1.வல்லின இடங்கள்	ப மாகும					
இடங்கள் 2. வல்லின	ம்பிகா					
இடங்கள்						
3. வினா						
வனுக்கள்						
4. விடை வடை						
வகைகள்	иЯфА					
மொழிப்ப 1 நடி நடி	•					
ா. கடிதய 6 2 செய்வி <i>வ</i>	ரழுதும் முறை னை - செயப்பாட்டு					
ചിത് <u></u> ഞ		45மணிநேரம்				
	ாலிப் பிழையைநீக்குக	_				

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Subject Code: HBHI22002	Subject Name: HINDI -II	T/L/ ETL	L	T / S.Lr	P/R	С	
	Prerequisite : Knowledge of Hindi	Ту	3	0	0	3	
L : Lecture, T : 7	Гutorial,SLr : Supervised Learning, P: Project, R : Rese	arch, C	: Credit	s,			
	T/L/ETL : Theory / Lab / Embedded Theory and Lab						
	OBJECTIVES						
	1.To Understand the Ancient Hindi plays and its aspects.						
2. To understand the medival stories and well known novels							
3. To know the techniques in writing Annotation and Translation							

		MES (Cos) this course w	ere able to										
CO1		To introduce poets and wri		e real world	situation wit	h the help of	Plays and st	ories written	by variou				
CO2		To make stud	nake students understand the Literature in broader areas than merely confined to the subject										
CO3		. Evaluating t Literature.	he concept of	f Hindi from	past to prese	nt and to stud	dy the society	y closely thro	ough				
CO4		.To make the	e best use of	Hindi langu	age in vari	ous streams							
CO5		Helps in the	r Career acc	quiring know	vledge in a	language							
Mapping	of Course	Outcome with	Program O	utcome (PO	s)								
Sem		Coursecod	e: HBHI220	002									
Π		Programme	Outcomes(Pos)									
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9				
CO1	CO1	3	2	3	2	3	3	3	3				
CO2	CO2	3	3	3	3	2	3	3	3				
CO3	CO3	3	3	2	3	3	3	3	3				
CO4	CO4	2	3	3	3	3	2	2	3				
CO5	CO5	3	3	3	3	3	2	2	3				

3/2/1 Indicates Strength Of Correlation, 3 – High, 2- Medium, 1- Low

Category	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdiscipl inary/Allie d	Practical Project/ Internship	others
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Subject Code: HBHI22002	Subject Name: HINDI -II	T/L/ ETL	L	T / S.Lr	P/R	С		
	Prerequisite : Knowledge of Hindi	Ту	3	0	0	3		
I · Locture T · Tutoria	· Lastura T · Tutorial SL r · Supervised Lastning D: Project D · Descerab C · Credits T/L/ETL							

L : Lecture, T : Tutorial,SLr : Supervised Learning, P: Project, R : Research, C : Credits, T/L/ETL :Theory / Lab / Embedded Theory and Lab

UNIT – I One Act Play – novel and translation of hindi language)

- 1. Auranzeb ki AakhiriRaat
- 2. Auranzeb ki AakhiriRaat
- 3. Mukthidhan
- 4. Practice of AnnotationWriting
- 5. Practice of Summary and Literary evaluationWriting

UNIT – II One Act Play – novel and translation of hindi language)

- 6. Auranzeb ki AakhiriRaat
- 1. Laksmi kaSwagat
- 2. Mithayeewala
- 3. Practice of AnnotationWriting
- 4. Practice of Summary and Literary evaluationWriting

UNIT-III One Act Play – novel and translation of hindi language)

- 7. Auranzeb ki AakhiriRaat
- 1. Basant Ritu kaNatak
- 2. Seb Aur Dev
- 3. Practice of AnnotationWriting
- 4. Practice of Summary and Literary evaluationWriting

UNIT-IV One Act Play – novel and translation of hindi language)

- 8. Auranzeb ki AakhiriRaat
- 1. Bahut BadaSawal
- 2. Vivah ki TeenKathayen
- 3. Practice of AnnotationWriting
- 4. Practice of Summary and Literary evaluationWriting

UNIT-V Translation of Hindi Lanaguage to English language-paragraph, technical terms)

- Translation Practice. (English Book Reference: 1. Aath Ekanki, Edited by Devendra Raj Ankur, Mahesh Anand Vaani prakashan, 4695, 21- A Dariyagunj, New Delhi-110002
- 2. Swarna Manjari, Edited by Dr.Chitti Annapurna, Rajeshwari Publications 21/3, Mothilal street, (opp.Ranganthan Street) T.Nagar, Chennai-600017
- 3. Prayojan Mulak Hindi : Dr.Syed Rahmathullah, Poornima Prakashan, 4/7, Begum III street, Royapettah, Chennai-14
- 4. Anuvad Abhyas Part III Dakshin Hindi Prachar Sabha, T.Nagar , Chennai -17



Course /subject Code	HBFR22002	Semester	4	5 hrs		II
Category	All U	JG Programs	L	T/SLr	Catego ry	All UG Programs
Course Title	I	French -II	3	0	Course Title	French II (THEORY)
L : Lecture T : Tutorial SLr : Supe	ervised Learning P	P: Project R : Research C : C	Credits			
T/L/ETL : Theory / Lab / Embedd	ed Theory and Lat	0				
OBJECTIVES						
1 Students will be able to unde	rstand the familiar	words and expressions wh	nen some	one talks s	slowly ar	nd distinctly.
2. The students will be able to re	eads; he/she will b	e able to understand the po	sters, adv	vertisemer	nts or cata	alogues.
3. The students will be able to c	ommunicate and a	sk and reply to simple ques	stions on	familiar s	ubjects	

The students will be able to use expressions and write simple sentences without faults to describe their living spaces

FRENCH-II(THEORY) LANGUAGE-II New subject code									
COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
COURSE OUTCOME 1	3	2	2	2	2	1	2	2	3
COURSE OUTCOME 2	2	2	2	2	1	1	3	2	3
COURSE OUTCOME 3	2	3	2	3	1	1	2	2	3
COURSE OUTCOME 4	3	2	3	2	2	2	2	3	3
COURSE OUTCOME 5	2	2	2	3	3	3	3	2	3
COURSE OUTCOME 6	3	3	2	2	3	3	3	3	3
COURSE OUTCOME 7	3	3	2	2	3	3	3	3	3

MAPPING OF Cos WITH POs

		H/M/L	indicates	strength	of correla	tion H-High M-M	ledium L-	Low		
Category	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplinary/Allied	Skill component	Practical Project/ Internship	others	
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			45	5 hrs		Π
Course /subject Code	HBFR22002	Semester				
			L	T/SLr	Catego	
Category	All UG	Programs			ry	All UG
						Programs
Course Title	Fren	ich -II	3	0	Course	French II
					Title	(THEORY)
L : Lecture T : Tutorial SLr : Supe	ervised Learning P: Pr	oject R : Research C : C	redits			
T/L/ETL : Theory / Lab / Embedd	ed Theory and Lab					

UNIT I

Compétences communicatives, phonologiques, linguistiques, grammaticales et culturelles

- Se saluer, prendre congé, se présenter quelqu'un/quelque chose, Salutations, présentatifs, détails d'identité, professions, quartiers
- Genres, nombres, articles, présentatifs, pluriels des noms, c'est/il est, pronoms toniques
- Salutations française, comportement des salutations, les quartiers parisiens, le peintre Monet
- > Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)
- > Audio clips- For oral expressions, oral assignments and oral test-20- duration less than 2 minutes (10 oral exercises, 6 audio reading compositions& 4 tests).

UNIT II

Compétences communicatives, phonologiques, linguisiques, grammaticales et culturelles

- Dialogue de la vie d'étudiant, des liens familiaux, de l'appartenance, des habitudes ; poème, le son « eu » énonces a répéter, lecture guidée.
- S'exprimer de la fréquence, des habitudes, articles, present de l'indicatif, verbes a la terminaison er, adjectifs possessifs et qualificatifs, locutions avec « avoir »
- Demander l'heure, Les jours, Les mois de l'année.
- > Clip audios : Exercices orales, compositions orales et épreuves orales.(20 –durée moins de 2 minutes)

> Audio clips- For oral exercises, oral assignments and oral test-20 duration less than 2 minutes (10 oral excercises ,6 audio reading compositions & 4 tests).

UNIT III

Compétences communicatives, phonologiques, linguistiques, grammaticales et culturelles

- Parler des voyages, identifier les vêtements, caractériser de personnes, faire des exclamations, s'informer sur la vie d'étudiant français.
- Poème, le « son i », décrire des personnes, prononcer le nom des pays et des nationalités,
- appréciation/exclamation
- Transport et voyages, les pays, nationalités, la mode, la partie du corps ,Adjectifs de nationalités et genres, adjectifs réguliers/irréguliers, prépositions de lieux, verbes aller- venir et verbes a la terminaison –ir
- L'aéroport de Roissy, a la douane, les vêtements, a mode a paris, quelques professions, le sport et la sante ; a Joconde, la BD,

9hrs

9hrs

9hrs

Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)

> Audio clips- For oral expressions, oral assignments and oral test-20-duration less than 2 minutes (10 oral

exercises ,6 audio Reading compositions & 4 tests)

UNIT IV

Compétences communicatives, phonologiques, linguistiques, grammaticales et culturelles

- Communication au restaurant, des recettes, le gout et les préférences identifier le type des restaurants.
- Poème, le son « o » énonces simples, des sons nasaux, exercices de répétition
- Les repas français recette activités et sportives
- Clip audios : Exercices orales, compositions orales et épreuves orales.(20 –durée moins de 2 minutes)

> Audio clips- For oral expressions, oral assignments and oral test-20 duration less than 2 minutes (10 oral exercises ,6 audio reading

UNIT V

Compétences communicatives, phonologiques, linguistiques, grammaticales et culturelles

- Planifier des vacances, parler des concours, du sport, du temps qu'il fait, s'exprimer au comparatif •
- Poème le son « yu », répétition d'énonces, lire de noms de quelques villes
- Activités de vacances, mots de localisation, plan de Paris, le climat et l'écologie, un concours international, les saisons
- Adjectifs de couleur, nombres ordinaux, quelques verbes irréguliers,
- 3 temps autour du présent « de » et « a » et des verbes. Différentes formes du négatif, « il fait » le comparaient le superlatif absolu
- Auberges de jeunesse, vacance, plan de Parise arrondissements quelques monuments parisiens, tourisme fluvial français
- Clip audios : Exercices orales, compositions orales et épreuves orales. (20 –durée moins de 2 minutes)

> Audio clips- For oral expressions, oral assignments and oral test-20 duration less than 2 minutes (10 oral exercices ,6 audio Reading compositions& 4 tests).

Reference Books:

1. Parlez-vous français? Partie 1 - Dr.M.Chandrika.V.Unni &Mrs. Meena Mathews 2019 by Universal publisher

2. CLE INTERNATIONAL Lectures Clé en français facile. (2012) Hachette Paris

3. Cosmopolite: Livre de eleve A1 by Nathalie Hirsch sprung, Tony

Tricot, Claude Le Ninan

4. Latidudes-1 by Régine Mérieux & Yves l'oiseau, Didier 2017

5. Alter Ego 1 - Catherine Dolez, Sylvie Pons : (2014) Hachette, Paris

9hrs



9hrs

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HBEN22002 LANGUAGE II - ENGLISH II Ty/Lb/ **T**/ P/R С L S.Lr ETP (Common to all UG Courses under H&S) Ty Total contact hours - 45 3 0 0/0 3 Prerequisite – English Language T/L/:Theory/LabL:LectureT:TutorialP:Practical/ProjectR:ResearchC:Credits **Course Objectives** Develop four language skills appropriate to the level of education. 1. Demonstrate knowledge of vocabulary and sentence construction in appropriate contexts. 2. Express diverse forms of knowledge in different social and cultural contexts. 3. Attain a comprehensive knowledge of communication skills to use ethically. 4. 5. Develop organized academic and business writing for professional careers. **Course Outcomes (COs)** 1. Develop four language skills appropriate to the level of education. 2. Demonstrate knowledge of vocabulary and sentence construction in appropriate contexts. Express diverse forms of knowledge in different social and cultural contexts. 3. 4. Attain a comprehensive knowledge of communication skills to use ethically. 5. Develop organized academic and business writing for professional careers. **Program Specific Outcomes (PSOs)** Demonstrating mastery of the components of English language and literature. • • Explaining through literature in English, diverse historical cultural and social ethics Applying literary critical perspectives to generate original analysis of literature in English • Promoting cultural values and real-life skills through English language and Literature Mapping of course outcomes (COs) with Program Outcomes (POs)& Program Specific Outcomes (3/2/1 indicates the strength of correlation) 3= High; 2= Medium; 1= Low CO PO1 **PO2** PO3 PO4 PO5 PO6 PO7 PO8 **PO9** PSO PSO **PSO PSO** 1 2 3 4 3 3 3 3 3 1 3 3 3 3 3 3 1 3 2 3 3 3 3 3 3 3 3 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 4 1 3 5 3 3 3 3 3 3 3 3 3 3 1 3 Skill H&S Progra Category Progra Open Skill Interdi Practic others electiv enhanc sciplin compo m core m al Electiv ary/All nent Project ing e electiv ied e e Interns hip $\sqrt{}$

Br. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE DEMED TO BE UNIVERSITY University with Graded Autonomy Status (An ISO 21001 : 2018 Certified Institution) Perivar EVEN Hub Read. Madurayoval. Chempair. 95. Tamilinadu, India.

(An Periyar E.V.R. Hi P/R **HBEN22002** LANGUAGE II - ENGLISH II Ty/Lb/ L **T**/ С S.Lr ETP (Common to all UG Courses under H&S) Ty Total contact hours - 45 3 0/00 3 Prerequisite - English Language T/L/:Theory/LabL:LectureT:TutorialP:Practical/ProjectR:ResearchC:Credits **Course Objective** 1. Develop four language skills appropriate to the level of education. Demonstrate knowledge of vocabulary and sentence construction in appropriate contexts. 2 Express diverse forms of knowledge in different social and cultural contexts. 3. Attain a comprehensive knowledge of communication skills to use ethically. 4 5. Develop organized academic and business writing for professional careers. Unit I: 9 Hours All the World's a Stage - William Shakespeare 1. Speech of Barack Obama 2. 3. The Verger- Somerset Maugham Unit II: 9 Hours Spider and the Fly - Mary Howitt 1. "They thought that a bullet would silence us, but they failed". - Malala Yousafzai 2. 3. Refund – Fritz Karinthy Unit III: 9 Hours 1. Night of the Scorpion-Nissim Ezekiel 2. On Running after one's hat- G.K.Chesterton 3. The Last Leaf – O. Henry Unit IV: 9 Hours 1. Polonius Advice to Laertes-William Shakespeare 2. 'We Must Continue to Dream Big': An open letter from Serena Williams 3. The Necklace - Guy de Maupassant Unit V: 9 Hours 1. Functional English: Letter Writing (Formal, Informal, Email) 2. Resume 3. Précis 4. Reading Comprehension 5. Developing the hints Course Outcome: On completion of the course, the students will be able to Develop four language skills appropriate to the level of education. 1. Demonstrate knowledge of vocabulary and sentence construction in appropriate contexts. 2. Express diverse forms of knowledge in different social and cultural contexts. 3. Attain a comprehensive knowledge of communication skills to use ethically. 4. 5. Develop organized academic and business writing for professional careers. **Prescribed Text:** 'Greatest Speeches of the Modern World', Rupa Publications India, 2018. • Woudhuysen H.R. 'The Arden Shakespeare third series', the Arden Shakespeare Publishers, 2020. Karinthy. Fritz, 'Refund: A Play in One Act', French. Samuel, 1938. • Simpson H. C & Wilson E. H, 'A Senior Anthology of Poetry', Macmillan Education, 1952. • O'Brien. Terry, '50 Greatest Short Stories', Rupa Publications India; First Edition, 2015. J.C.RichardswithJ.Hull&S.Proctor,Interchange,Level3,CambridgeUniversityPress,2021. • MarkHancock, EnglishPronunciation inUse, CUP, 2016. M.ChandrasenaRajeswaran&R.Pushkala,CommunicationLabWorkbook2022. M.ChandrasenaRajeswaran, R.Pushkala & S.BhuvaneswariPinnacle: ASkillsIntegratedText, 2022 Dutt,K,Rajeevan,G&Prakash,,ACourseonCommunicationSkills,1stedn,CUP,Chennai,2008 Suggested Links:

- <u>https://www.poetrybyheart.org.uk/poems/the-spider-and-the-fly/Reference.</u>
- <u>https://poets.org/poem/unknown-citizen</u>

Br. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE DEMED TO BE UNIVERSITY University with Graded Autonomy Status (An ISO 21001 : 2018 Certified Institution) Perjar E.V.F. High Road, Maduravoya, Chennal-95, Tamilnadu, India.

С Subject Name ALLIED –II:MATHEMATICS-II Ty/Lb/E Τ/ P/R Subject Code: TP/IE L S.Lr HBMA22ID2 3 1 Prerequisite : Higher Secondary Mathematics Tv 0 4 L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab **OBJECTIVES** To understand the Basic concepts in Ordinary Differential equations • To understand the Basic concepts in Partial Differentiation To understand the Basic concepts in Multiple integrals To understand the Basic concepts in Linear programming To understand the Basic concepts in Transportation and Assignment • **COURSE OUTCOMES (Cos)** Students completing this course were able to Understand the basic concept First order differential equations – Second and higher order linear **CO1** differential equations with constant coefficients. **CO2** Understand how to solve the Problem in Partial derivatives, Jacobians, Maxima and Minima of functions of two variables and Lagrange's multipliers. **CO3** Learn how to solve problems in Cartesian and Polar Co-ordinates (Double and Triple integral) and Change of order of integration. **CO4** Understand the concept in Formulation of LPP, Standard form of LPP, Graphical method and Simplex method. Learn to solve problems in Transportation using MODI method and Assignment problem using **CO5** Hungarian method. Mapping of Course Outcome with Program Outcome (POs) Cos/POs **PO1** PO₂ **PO3** PO5 **PO4 PO6 P07 PO8 P09 CO1** 3 2 3 3 2 2 3 2 2 3 3 3 **CO2** 1 2 3 1 2 3 2 **CO3** 3 2 1 3 3 1 3 3 3 3 3 3 **CO4** 2 1 2 1 3 3 2 2 **CO5** 3 3 3 3 2 3 **PS04** Cos/PSOs **PS01 PS02 PS03 CO1** 3 3 2 2 **CO2** 2 2 1 3 3 **CO3** 3 3 1 **CO4** 3 3 2 3 **CO5** 2 3 3 3 3/2/1 Indicates Strength Of Correlation, 3 - High, 2- Medium, 1- Low H&S Program core Program Open Skill Interdisciplin Skill Category Practical others Elective elective enhancing ary/Allied component Project/ elective Internship $\sqrt{}$

CALL CONTINUES AND RESEARCH INSTITUTE EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY University with Graded Autonomy Status (An ISO 21001 : 2018 Certified Institution) Periyar EV.K. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.

Subject	Subject Name ALLIED –II:MATHEMATICS-II	Ty/Lb/E		Τ/	P/R	С
Code:		TP/IE	L	S.Lr		
HBMA22ID2	Prerequisite : Higher Secondary Mathematics	Ту	3	1	0	4
	Tutorial SLr : Supervised Learning P: Project R : Research C : Cred ry / Lab / Embedded Theory and Lab	lits				

Course Outcomes:

To understand the Basic concepts in Ordinary Differential equations

To understand the Basic concepts in Partial Differentiation

To understand the Basic concepts in Multiple integrals

To understand the Basic concepts in Linear programming

To understand the Basic concepts in Transportation and Assignment

UNIT I ORDINARY DIFFERENTIAL EQUATIONS

First order differential equations – Second and higher order linear differential equations with constant coefficients and with RHS of the form: e^{ax} , x^n , Sin ax, Cos ax, $e^{ax}f(x)$, x f(x) where f(x) is Sin bx or Cos bx(simple problems).

UNIT II PARTIAL DIFFERENTIATION

Partial derivatives - Jacobians - Maxima and Minima of functions of two variables - Lagrange's multipliers.

UNIT III MULTIPLE INTEGRALS

Double integrals in Cartesian and Polar Co-ordinates – Change of order of integration – Triple integrals in Cartesian Co-ordinates (simple problems).

UNIT IV LINEAR PROGRAMMING

Formulation of LPP – Standard form of LPP – Graphical method – Simplex method.

UNIT V TRANSPORTATION AND ASSIGNMENT

Formulation of Transportation problem – North West corner method – Least cost method – Vogel's approximation method – Optimality test – MODI method – Degeneracy – Assignment problem: Hungarian method.

Total no. of hrs: 60

Reference Books:

- 1) Vittal.P.R, Allied Mathematics, Margham Publications., Chennai, (2012).
- 2) Venkatachalapathy.S.G, Allied Mathematics, Margham Publications., Chennai, (2007).
- 3) Singaravelu, Allied Mathematics, Meenakshi Agency., Chennai, (2001).
- 4) Hamdy A. Taha, *Operations Research: An Introduction (10th ed.)*, Pearson, (2017).

5) Hira D.S., Gupta P.K., *Operations Research*, S.Chand& Co., (2014).

(12 hrs)

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Subject Code: CBCA23001	PRÖGRA	MMING	IN C++	ENTED Pa e in C Prog	ARADIGM gramming	AND T	•	L 2	T / S.L r 1	P/R 0	C 3
L : Lecture T : T/L/ETL : The				0 0	ct R : Resea	rch C : C	redits				
OBJECTIVE	S										
 To intro To prov Overloa To unde To fami 	erstand the co iliarize the ad	acepts of C ge about C oncepts inh	++, Functi lass and C eritance, p	on and Exc bject, Cons	eption Hand structor and sm and virtu	destructo	on.				files
COURSE OU	•	,									
Students comp CO1				f OOD 1:1	Class OL:	ot Energy	mlotice I-1		00000	nd	
COI	Understand Polymorphi		concepts o	T OOP like	Class, Obje	ect, Encap	sulation, ini	ierii	ance a	na	
CO2	Evaluate the Function O	e C++ Prog						er in	npleme	nting	
CO3		Class and O ecution tin	bject that	leads to implementation	plementing	OOPs con	ncept in Prog				
CO4	Implement because of	the usage of	of Inherita	nce in real t						pment	time
CO5	Create Tem related to da	plates to ir								roblem	IS
Mapping of C	ourse Outco	ome with F	Program (Dutcome (I	POs)						
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	00
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			3	1	2	3	1		2		2
CO3	3	2	3 2	1	2 3	3 3	1 1		2 3		2 3 3
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CO3 CO4 CO5 Cos/PSOs	3 3 3 PS	2 3 3 01	3 2 3 2	1 1 2 3 S02	2 3 1 2 PS	3 3 3 3 503	1 1 2		2 3 1 2 PS04		2 3 3 3
CO3 CO4 CO5 Cos/PSOs CO1	3 3 3 PS	2 3 3 01	3 2 3 2	1 1 2 3 S02 3	2 3 1 2 PS	3 3 3 3 503 2	1 1 2		2 3 1 2 PS04 2		2 3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2	3 3 3 PS	2 3 3 01 3	3 2 3 2	1 1 2 3 S02 3 2	2 3 1 2 PS	3 3 3 3 503 2 1	1 1 2		2 3 1 2 PS04 2 3		2 3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 3 PS	2 3 001 3 2 3	3 2 3 2	1 1 2 3 S02 3 2 3	2 3 1 2 PS	3 3 3 3 503 2	1 1 2		2 3 1 2 PS04 2		2 3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2	3 3 3 PS 3 2 3	2 3 3 001 3 2 3 3 3	3 2 3 2	1 1 2 3 S02 3 2	2 3 1 2 PS	3 3 3 3 503 2 1 1	1 1 2		2 3 1 2 PS04 2 3 3		2 3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4	3 3 3 PS 3 2 2 3 3 3 2 2	2 3 001 3 2 3 3 2 2	3 2 3 2 P	1 1 2 3 S02 3 2 3 3 3 3	2 3 1 2 PS	3 3 3 3 503 2 1 1 2 3	1 1 2		2 3 1 2 PS04 2 3 3 3 3		2 3 3 3

2. Sheild, H (2002) C++ Complete Reference(4th ed.), McGraw-Hill Osborne Media

UNIT I

Introduction to OOPs : Object Oriented Programming, Basic concepts of OOPs, Benefits of OOPs. Introduction to C ++ : Tokens - Keywords, -Identifiers - Data types - Constants - Operators - I/O statements, Manipulators.

UNIT II

Introduction to C ++ : Structure of C++ program - Control structures - Arrays - Pointers - Functions: Function Prototype, Inline function, Function Overloading.- Exception Handling.

UNIT III

Class & Objects : Class Members - Objects - Visibility modes - Friend functions - Static members - Constructors & Destructors -Operator Overloading - Rules for Overloading, Unary and Binary operator overloading.

UNIT IV

UNIT V

Inheritance & Polymorphism : Concept of Inheritance : Types of Inheritance - Polymorphism - Virtual Classes -Pointer to Derived class - Virtual functions: Rules for Virtual function, Pure Virtual functions.

Streams, Files, Templates: Streams : C++Streams, Stream classes. Files : Classes for file stream operations, opening and closing a file, Detecting End of File. Templates : Function and Class Templates.

TEXT BOOK:

1. Balguruswamy, E (2008) Object Oriented Programming With C++, (4th ed.) Tata McGraw-Hill.

REFERENCES:

1. Richard Johnson Baugh & Martin Kalin (1998) *Object Oriented Programming In* $C++(1^{st} ed.)$, Prentice Hall

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Subject	Subject Name: OBJECT ORIENTED PARADIGM AND	Ty/Lb/ETP/		Τ/	P/R	С
Code:	PROGRAMMING IN C++	IE	L	S.L		
CBCA22002				r		
	Prerequisite : Basic knowledge in C Programming	Ту	2	1	0	3
L : Lecture T : T	Tutorial SLr : Supervised Learning P: Project R : Research C :	Credits				
T/L/ETL : Theo	ry / Lab / Embedded Theory and Lab					
NIT I					09 Hrs	

Total No of Hrs: 45

09 Hrs

09 Hrs

09 Hrs

09 Hrs

54



Subject Code: CBCA22003	Subject	Name: MUI	TIMEDI	A AND AN	NIMATIO		/Lb/ TP/I	L	T / S.Lr	P/R	C
	Prerequ	isite : Basic	knowledge	e in Comp	uters]	Гу	3	1	0	4
L : Lecture T T/L/ETL : The					ct R : Resea	arch C : Creo	lits				1
OBJECTIVE	S										
To deteTo discTo den	ermine vario cuss fundan nonstrate th	characteristi ous tools and nentals, types e use of digi e in Animati	its types of file for	of multimed mats, medi , video cor	dia system ia and data ntrol, and sc	streams and anned imag	text mes.		different	platfo	rms
COURSE OU											
Students comp CO1	Create a	course were multimedia p of multimedi	resentation	n with diffe	erent platfor	ms and proi	noting	the h	ardware	and	
CO2	Expose the	he different T animation a	ools avail				ion at p	ar w	ith variou	ıs indu	stri
CO3	Demonst types of f	rate the purp file format. D	ose of usin eveloped	g audio in various Mu	multimedia Iltimedia Sy	, identify so /stems appli	cable in	n real	time.	•	fere
CO4	sentences Cameras	various file f s and paragra and Scanner	phs. Sourc s.	e of inform	nation as op	en source Ir	nage Pi	roces	sing viz.,	Digita	
CO5	application	l interactive i ons and evalu	ate for its	optimum p	erformance		workin	g pro	tocols for	r multi	me
Mapping of (0			D O(_			
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CO3	3	2	3			3 3			2 3		2 3 3
CO4	3	2 3	1 3	2 1 2	2	3 3 3	2 1 2		2		2 3 3 3
CO4 CO5	3	2 3 3	1 3 2	2 1 2 3	2 3 2 1	3 3 3 3	2 1		2 3 2 1		2 3 3
CO4	3	2 3	1 3 2	2 1 2	2 3 2 1	3 3 3	2 1 2		2 3 2		2 3 3 3
CO4 CO5 Cos/PSOs CO1	3	2 3 3	1 3 2	2 1 2 3	2 3 2 1	3 3 3 3 S03 2	2 1 2		2 3 2 1		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2	3	2 3 3 PS01	1 3 2	2 1 2 3 S02	2 3 2 1	3 3 3 3 803	2 1 2		2 3 2 1 PS04		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2 CO3	3	2 3 3 PS01 3 3	1 3 2	2 1 2 3 S02 3 2 3	2 3 2 1	3 3 3 3 S03 2	2 1 2		2 3 2 1 PS04 2 3 3		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4	3	2 3 3 PS01 3 2 3 3	1 3 2	2 1 2 3 S02 3 2 3 3 3	2 3 2 1	3 3 3 3 3 803 2 3 1	2 1 2		2 3 2 1 PS04 2 3 3 3 3		2 3 3 3
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CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 3 3 PS01 3 2 3 3 2 2/1 Indicates	1 3 2 P P Strength O Program	2 1 2 3 S02 3 3 3 3 5 f Correlation Open	2 3 2 1 P on, 3 – Hig Skill enhancing	3 3 3 S03 2 2 3 1 1 h, 2- Medium Interdisciplin	2 1 2 3 	ow	2 3 2 1 PS04 2 3 3 3 3 3 9 7 ractical Project/	oth	2 3 3 3 3

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	Subject Code: CBCA22003	Subject Name: MULTIMEDIA AND ANIMATION	Ty/Lb/ ETP/I E	L	T / S.Lr	P/R	С
		Prerequisite : Basic knowledge in Computers	Ту	3	1	0	4
U	NIT I	·	1	2 Hrs	-	•	

Introduction to Multimedia, characteristics of a Multimedia, Hardware and software requirements, Uses of multimedia, Promotion of multimedia based content, steps for creating Multimedia presentation. Platforms: Macintosh Versus PC -The Macintosh Platform - The Windows Multimedia PC platform- Input Devices - Output Hardware - Communication Devices.

UNIT II

Basic Tools:Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animtion Tools - Image - Editing Tools - Sound Editing Tools - Animation, Video and Digital Movies Tools -Multimedia Authoring Tools: Types of Authoring Tools - Card and page Based Authoring Tools - Icon - Based Authorised Tools - Time Based Authoring Tools - Object - Oriented Authoring Tools - Cross - Platform Authoring Notes.

UNIT III:

UNIT IV:

Text: Introduction, Types of Text, Unicode Standard, Font, Insertion of Text, Text compression, File Formats-Hypermedia and Hypertext. Image: Introduction, Image Types, Seeing color, color models, Basic steps for Image Processing, Scanner, Digital Camera, Interface Standards, Image Processing software, File formats, Image output on monitor, Image output on printer.

Audio: Introduction, Fundamentals Characteristics of sound, Elements of Audio systems, Microphone, Amplifier, Loudspeaker, Audio mixer, Musical Instrument Digital Interface(MIDI), MIDI messages, MIDI connections, Sound card, Audio File Format and CODECs, Software Audio Players, Audio Recording Systems, Audio and multimedia, Audio Processing software.

Video: Introduction, Analog video camera, Transmission of video signals, Video signal format, Digital video, Digital Video Standards, PC Video, Video File Format and CODECs, Video editing, Video editing software.

UNIT V:

Animation: Introduction, Uses of animation, Key frames and Tweening, Types of animation, Computer Assisted Animation, Creating movements, Principles of animation :Special Effects - Survey Of Animation Tools- Video Technologies: Analog Video - Ccd Camera, Broadcasting - Recording Formats - Storage Principle and Retrival Technologies - Magnetic Media Technologies and Storage Devices Total No of Hrs: 60

Text Book:

Principles of Multimedia By Ranjan Parekh- The Tata McGraw Hill companies. -Sixth Reprint 2008

12 Hrs

12 Hrs

12 Hrs

12 Hrs

Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY UNIVERSITY UNIVERSITY UNIVERSITY CONFIDENCESSION A ISO 2 1001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennal-95, Tamilnadu, India.

SUBJECT CODE:	Subject	Name: PRO	GRAMM	ING IN C+	⊦+ LABOF	RATORY	Ty/Lb/ ETP/IE	L	T / S.Lr	P/R	С
CBCA22L02	Prerequ	isite : Basic l	knowledge	e in C Prog	gramming		Lb	0	0	4	2
L : Lecture	T : Tutoria	l SLr : Super	vised Lear	ning P: Pro	ject R : Re	search C : C	redits				
		b / Embedde		. .	5						
OBJECTI	VES										
• To i	ntroduce th	e basic conce	pts of obje	ect oriented	programm	ing like Clas	s, Object,	Con	structor	r.	
		he concepts]					-				
		oncepts of C-									
		wledge about									
		knowledge ii	n the advar	nce concept	s like Tem	plate and Str	eams and	to in	culcate	the us	sag
	andling file										
	OUTCOM	ES (Cos) is course we	ra abla ta								
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		execution ti									
CO2		he concept I								t time	
		of Code Reus									
	and reada										
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CO4 CO5 Mapping o Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1	function Applying Inline fun Create To related to of Course C PO1 3 3 3 3 3 2 2	to access Private of the concept of	vate data o Operator O ace executi mplements h Program PO3 3 3 2 3 3 3	utside the c Overloading ion time. Generic Pr n Outcome PO4 2 1 2 1 3	ass. g to achieve cogramming (POs) PO5 3 3 2 1 2 1 2	e Compile T g. Apply file PO6 2 3 3 3 3 3 803 1	PO7 PO7 2 1 2 1 1 2 1	and	hism an solve pr PO8 3 3 2 1 2 PS04 2	d exan	ns 09 2 3 3 3
CO4 CO5 Mapping o Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO2 CO3 CO4	function Applying Inline fun Create To related to of Course C PO1 3 3 3 3 3 2 2	to access Priv the concept action to redu emplates to in data files. Dutcome with PO2 2 3 2 3 2 3 PS01 3 3	vate data o Operator O ace executi mplements h Program PO3 3 3 2 3 3 3	utside the cOverloadingion time.Generic Prn OutcomePO421213S023323	ass. g to achieve cogramming (POs) PO5 3 3 2 1 2 1 2	e Compile T g. Apply file PO6 2 3 3 3 3 803 1 2	PO7 PO7 2 1 2 1 1 2 1	and	hism an solve pr PO8 3 3 2 1 2 PS04 2 3 3 3 3	d exan	ns 09 2 3 3 3
CO4 CO5 Mapping o Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3	function Applying Inline fun Create To related to of Course C PO1 3 3 3 3 3 2 5	to access Priv the concept action to redu emplates to in data files. PUCOME with PO2 2 3 3 2 3 3 2 3 3 2 3 2	vate data o Operator O ice executi implements h Program PO3 3 3 2 3 3 P	utside the c Overloading ion time. Generic Pr n Outcome PO4 2 1 2 1 3 3 3 2 3 3 3	elass. g to achieve rogramming (POs) PO5 3 3 2 1 2 P	e Compile T g. Apply file PO6 2 3 3 3 803 1 2 1 2 3	PO7 2 1 2 1 3	and	hism an solve pr PO8 3 3 2 1 2 1 2 PS04 2 3 3	d exan	ns 09 2 3 3 3
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SUBJECT CODE:	Subject Name: PROGRAMMING IN C++ LABORATORY	Ty/Lb/ ETP/IE		T / S.Lr	P/R	С
CBCA22L02	Prerequisite : Basic knowledge in C Programming	Lb	0	0	4	2
	: Tutorial SLr : Supervised Learning P: Project R : Research C : C eory / Lab / Embedded Theory and Lab	redits				

Write a C++ program

- 1. To implement Class
- 2. To implement Constructor
- 3. To demonstrate Inheritance
- 4. To implement Function Overloading
- 5. To implement Virtual Function
- 6. To implement Friend Function
- 7. To implement inline function
- 8. To implement overloading Unary operator
- 9. To Prepare bio data using file Operations
- 10. To implement Template

Total no. of Hrs needed to complete the Lab: 60



Prerequisite : Basic theoretical knowledge AnimationL : Lecture T : Tutorial SLr : Supervised Learning P: Proje T/L/ETL : Theory / Lab / Embedded Theory and LabOBJECTIVES• To understand the different components, differe • To determine various tools of multimedia syster • To provide knowledge about multimedia syster • To demonstrate the use of digitized video contr • To gain knowledge in animation and images usiCOURSE OUTCOMES (Cos)Students completing this course were able toCO1Identify the various tools, components, fille f multimedia project.CO2Apply basic elements and principles of Phot effects like colour, shadows, background, crCO3CO4Apply 3D models in an enhanced format wit advanced animation effect.CO4Apply 3D models in an enhanced format wit advanced animation effect.CO5Prepare different web applications through f more interactive and expressive that ensuresMapping of Course Outcome with Program Outcome (I Cos/POsCO133CO2Quad33CO43CO4Apply basic elements and principles of Phot effects like colour, shadows, background, crCO5Prepare different we	FICAL		Ty/Lb T / P/R / /ETP/ L S.Lr IE							
T/L/ETL : Theory / Lab / Embedded Theory and Lab OBJECTIVES • To understand the different components, differe • To determine various tools of multimedia syster • To provide knowledge about multimedia media • To gain knowledge in animation and images usi COURSE OUTCOMES (Cos) Students completing this course were able to CO1 Identify the various tools, components, file fundition and images usi CO2 Apply basic elements and principles of Phote effects like colour, shadows, background, cr CO3 Create simple shapes using animation by str dynamic effect on the object as expected. CO4 Apply 3D models in an enhanced format wit advanced animation effect. CO5 Prepare different web applications through f more interactive and expressive that ensures Mapping of Course Outcome with Program Outcome (I CO3 3 2 2 CO4 3 3 1 CO2 3 3 1 CO5 PO1 PO2 PO3 PO4 CO5 3 3 2 2 CO4 3 3 2 3 CO5	in Multimedia and	l Lb	0	0	4	2				
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3/2/1 Indicates Strength Of Correlation	U U			Dung et 1		h.c.::				
Category H&S Program core Program Open Elective elective	Skill Interdisciple enhancing elective $$		t	Practical Project/ nternship		hers				



Subject Code: CBCA22IL1	Subject Name: ALLIED-I LAB:MULTIMEDIA AND ANIMATION LAB USING MATHEMATICAL APPLICATIONS Prerequisite : Basic theoretical knowledge in Multimedia and	Ty/Lb /ETP/ IE Lb	L 0	T / S.Lr	P/R	C 2
	Animation : Tutorial SLr : Supervised Learning P: Project R : Research C : Cred		•	U		2
T/L/ETL : The	eory / Lab / Embedded Theory and Lab					

LIST OF EXPERIMENTS

Photoshop:

- 1. Create an image using different properties.
- 2. Picture manipulation using filter.
- 3. Design pictures using layers.
- 4. Design our college ID Card
- 5. Design Marriage Invitation.

Flash :

- 6. Display real time clock.
- 7. Show India map with responsive screen to display state name.
- 8. Animate the staging concept with one example(chicken to hen).
- 9. Solving quadratic equation.
- 10. Matching animal voice with animal

Total no. of Hrs needed to complete the Lab: 60

EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY UNIVERSITY UNIVERSITY CONTINUES CONTINUES (A) ISO 21001 : 2018 Continue Institution)

Subject Code:	Subject N	Name: SOF			avoyal, Chennai-95	Г	Y/Lb/ET /IE	С	L	T/ SLR	P/1
HBCC22I03	Prerequis	site :					IE	1	0	0	2
L : Lecture T	: Tutorial Sl	Lr : Supervi	sed Learni	ng P: Proje	ct R : Rese	arch C : Cre	dits				_
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	elf-esteem a										
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Students com		· /	able to								
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CO3					0						
		empathy to				-					
CO4		good globa		•		<u>^</u>					
CO5	Develop l	ifelong lear	ning skills	to adapt in	the multic	ultural conte	ext of work	cpla	ces.		
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PSO2	· ·	g through lit		Ų							
PSO3		literary criti		Ų	Ų				0	sh	
PSO4		cultural va					-	-		1	
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	09
CO1	3	3	3	1	2	3	2		2		3
CO2	3	3	3	1	2	3	2		2		3
CO3	3	3	3	1	2	3	2		3		3
CO4	3	3	3	3	3	3	2		3		3
CO5	3	3	3	3	3	3	2		3		3
Cos/PSOs	Р	S01	P	S02	P	S03			PS04		
CO1		3		2		2			2		
CO2		2		2		2			2		
CO3		3		2		2			2		
CO4		3		2		2			2		
CO5		3		2		2			2		
		1 Indicates								1	
ategory	H&S F	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	F	ractical Project/ ternship	otł	ners
								1			

Subject Name: SOFT SKILL-II Ty/Lb/ET P/IE **HBCC22I03** Prerequisite : IE

Course Objectives:

- 1. to strengthen the students with the needed vocabulary
- 2. to infer information from the given passage through reasoning

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- 3. to train them in attending Group Discussion
- 4. to face the Technical and HR interview of the corporate
- 5. to raise communication proficiency to global standards

Unit I

Subject

Code:

Preparation of resume-functional resume with objective according to different advts.-how to have interview file-how to send it by email-concept of writing email-practise through BEC method(question and answer)

Unit II

Writing secretarial letters like intra-mail and inter-mail, agenda, memo and business reports-introducing GD through video-conduct of GD on a topic and also case studies

Unit III

Body language grooming-Interview skill-Dos and Donts-mock interview-exchange of interviewer and interviewee practical session

Unit IV(Department of Mathematics)

Number system - H.C.F & L.C.M - Problem on ages - Percentage - Profit & Loss - Ratio & Proportion -Partnership.

Unit V

Time & Work - Time & Distance - Clocks - Permutations & Combinations - Height & Distances - Odd man out and Series.

Text Book:

1. Soft Skill for Everyone-Jeff Butterfield, Part-1; Unit-D&E

- 2. EFA (English For All)-Dr. Padmasanni Kannan, Libin Roy Thomas
- 3. English for Competitive Exam-R.P. Bhatnagar, Rajul Bhargava
- 4. Placement Interview-S. Anandamurugan, Chapter-2&3
- 5. Alex K, Soft Skills ; S.Chand & Company Pvt Ltd, 2009
- 6. Rizvi Ashraf M, Effective Technical Communication ; Tata McGraw Hill ; 2005
- 7. Thorpe, Edgar, Course in Mental Ability and Quantitative Aptitude ; Tata McGraw Hill ; 2003
- 8. Agarwal, R.S, A Modern Approach to Verbal and Non-verbal Reasoning, S. Chand & Co;2004
- 9. R.S.Agarwal, Quantitative Aptitude for Competitive Examinations, S.Chand & Co., (2017)
- 10. Jobsearch.about.com
- 11. www.exsearch.in/interview.html

Course Learning Outcome:

Students completing the course Soft Skill-II will

- 1.be strengthened in the vocabulary
- 2. improve their reasoning and finding a logical sequence in the passage given
- 3. be prepared to face Group Discussion
- 4. know the nuances of the interview of the corporate
- 5.raise communication proficiency to global standards

Total: 30 Hrs

6 hours

6 hours

6 hours

6 hours

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Subject Code:	Subject Na	ame: ALLI	ED III: FI I	NANCIAI	L ACCOUN	TING	Ty/Lb/ ETP/IE	T / L S.Lr	P/R	С
MBFP22ID1	Prerequisi	te : Basic k	nowledge	e in Accou	nting Pract	ices	Ty 2	2 1	0	3
L : Lecture T :					ct R : Resea	rch C : Crea	lits			I
T/L/ETL : The	ory / Lab / E	mbedded T	heory and	Lab						
OBJECTIVE	S									
• To intro	duce the bas	ic financia	l terms use	ed in daily	life as well	as in busine	ess units			
• To mak	e them under	stand the a	ccounting	principles	and it's imp	ortance				
	art the knowl						tion			
	erstand the st					statements				
	e insight on h		al data car	n be interpr	eted.					
COURSE OU										
Students comp										
C01					ansaction by		and classify	ving the same	me	
					thmetic accu		• 1	••• ,	•	
CO2					ne profit or l nake effectiv					
	cash flows i			ients can m		e manciai			inge u	le
CO3				ion along y	with rectifica	ation also of	ving hird v	iew on Pa	rtnersk	in
000			lucinincai	ion along v		ttion also g	ving ond v		unci și	пр
	Accounting	Dractices								
CO4	Accounting Broad view		come gene	erating asse	ets are value	d to find ou	t the true a	nd fair Fin	ancial	
CO4	Broad view	on how in		erating asse	ets are value	d to find ou	t the true a	nd fair Fin	ancial	
CO4 CO5	Broad view position of	on how in the compar	nies.							
	Broad view position of	on how in the compar wledge on	nies. how capita		ets are value ït/Loss are c					
CO5	Broad view position of Insight know particular b	on how in the compar wledge on usiness for	nies. how capita m.	al and Prof	ït/Loss are c					
CO5 Mapping of C	Broad view position of Insight know particular b	on how in the compar wledge on usiness for	nies. how capita m.	al and Prof	ït/Loss are c				rds of	09
CO5 Mapping of C	Broad view position of Insight knov particular b course Outco	on how in the compar wledge on usiness for ome with P	nies. how capita m. Program (al and Prof Dutcome (I	ït/Loss are c POs)	lerived fron	n the Incom	plete reco	rds of	09
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CO5 Mapping of C Cos/POs CO1 CO2	Broad view position of Insight know particular b Course Outco PO1 2 2 2	r on how in the compar wledge on usiness for ome with P PO2 3 3	how capita m. Program (PO3 3 3	al and Prof Dutcome (I PO4 3 1	it/Loss are c POs) PO5 2 1	PO6 2 3	P07 3 1	PO8 2 1	P	2 3
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CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4	Broad view position of Insight know particular b Course Outco PO1 2 2 2	r on how in the compar wledge on usiness for ome with P PO2 3 3	how capita m. Program (PO3 3 3	al and Prof Dutcome (I PO4 3 1	it/Loss are c POs) PO5 2 1	PO6 2 3	P07 3 1	PO8 2 1	P	2 3
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CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO2 CO3	Broad view position of Insight knov particular b course Outco PO1 2 2 3 3 3 2 PS 3 3 2 3 3 3 2 3 3 3 3 2 3 3 3 3 3 3 3	on how in the comparison of the comparison of th	hies. how capita m. Program (PO3 3 3 2 3 3 3	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 2 3	POs) PO5 2 1 2 3 3 PS	PO6 2 3 3 3 503 3 2 3	P07 3 1 3 3 3	PO8 2 1 2 3 3 PS04 3 3 3 3	P	2 3 3 3
CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO3 CO3 CO4	Broad view position of f Insight know particular b Course Outco PO1 2 2 3 3 3 2 PS 3 3 2 2 PS	on how in the comparison of the comparison of th	hies. how capita m. Program (PO3 3 3 2 3 3 3	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 2	POs) PO5 2 1 2 3 3 PS	PO6 2 3 3 3 503 2	P07 3 1 3 3 3	PO8 2 1 2 3 3 PS04 3 3	P	2 3 3 3
CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO2 CO3	Broad view position of f Insight know particular b course Outco PO1 2 2 3 3 2 PS 3 3 2 PS 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	r on how in the comparison of the comparison of	nies. how capita m. Program (PO3 3 3 2 3 3 P P	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 3 3 3	POs) 2 1 2 3 3	PO6 2 3 3 3 503 3 2 2 2	P07 3 1 3 3 3	PO8 2 1 2 3 3 PS04 3 3 3 3	P	2 3 3 3
CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO3 CO4 CO3 CO4 CO5	Broad view position of i Insight know particular b Course Outco PO1 2 2 3 3 2 PS 3 3 2 PS 3 3 3 2 3 3 3 2 2 S 3 3 3 3 3 2 2 S 3 3 3 3	r on how in the comparison of the comparison of	nies. how capita m. Program (PO3 3 3 2 3 3 P P	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 3 3 3	POs) PO5 2 1 2 3 3 PS 0n, 3 – High	PO6 2 3 3 3 503 3 2 3 2 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4	P07 3 1 3 3 3	PO8 2 1 2 3 3 PS04 3 3 3 3	P	2 3 3 3
CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO3 CO4 CO3 CO4 CO5	Broad view position of Insight know particular b Course Outco PO1 2 2 2 3 3 2 PS 3 3 2 PS 3 3 2 3 3 3 2 2 S 3 3 3 2 2 S 3 3 3 2 2 S 3 3 3 2 3 3 3 3	r on how in the comparison of the comparison of	nies. how capita m. Program (PO3 3 3 2 3 3 P Strength O Program	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 2 3 3 5 Correlation Open	it/Loss are c POs) 2 1 2 3 3 PS on, 3 – High Skill	PO6 2 3 3 3 503 3 2 A, 2- Medium Interdisciplin	P07 3 1 3 3 3 1	PO8 2 1 2 3 3 PS04 3 3 3 PS04 3 Practical	rds of P	2 3 3 3
CO5 Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO2 CO3 CO4 CO2	Broad view position of Insight know particular b Course Outco PO1 2 2 2 3 3 2 PS 3 3 2 PS 3 3 2 3 3 3 2 2 S 3 3 3 2 2 S 3 3 3 2 2 S 3 3 3 2 3 3 3 3	i on how in the comparison of the comparison of	nies. how capita m. rogram (PO3 3 3 2 3 3 P 5 Strength O	al and Prof Dutcome (I PO4 3 1 3 3 S02 3 3 5 Correlation	it/Loss are c POs) 2 1 2 3 3 PS on, 3 – High	PO6 2 3 3 3 503 3 2 3 2 4 4 2 4 4 4 4 4 4 4 4 4 4 4 4	P07 3 1 3 3 1 n, 1- Low	PO8 2 1 2 3 3 PS04 3 3 3 3 3	rds of P	2 3 3 3 3

TEXT BOOKS:

- 1. Gupta R.L(2010) Advanced Accountancy(14th ed.), S.Chand, Delhi.
- 2. T.Ś Reddy and A.Murthy Financial accounting.

REFERENCES:

- Agarwala A. N. *Higher Science of Accountancy*(1st ed.) KitabMahal, Allahabad. Jam, S, P&Narang, K, L(2012)*Financial Accounting*(2nd ed.)Kalyani Publisher 1.
- 2.
- 3. Shukla, M, C & Grawel, T, S(2010) Adavnced Accounts(vol 1)(7th ed.), S.ChandPublishing

and Loss Appropriation Account.

Preparation of Final Accounts of Sole Trading Concern - Adjustments - Closing Stock - Outstanding and Prepaid items, Depreciation, Provision of Bad Depts., Provision for Discount on Debtors, Interest on Capital and Drawings -

UNIT II

Preparation of Cash Book – Types of Cash Book

Classification of errors - Partnership Accounts-types of partners - Partnership Deed and content - Methods to calculate interest on Drawings - Partners salary or commission - Interest on partners loan - Profit

Depreciation : Meaning, Causes, Types – Straight Line Method – Written Down Value Method (Change in Method excluded) - Insurance Claims – Average Clause (loss of stock only)

Single entry : Meaning - Features - Defects - Difference between Single Entry and Double Entry System-Statement of Affairs Method – Conversion Method (only simple problems)

UNIT I Meaning and Scope of Accounting : Basic Accounting Concepts and Conventions - Objectives of Accounting – Accounting Transactions – Double Entry Book Keeping – Journal, Ledger, Preparation of Trial Balance.

L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab **09 Hrs**

Subject Name: ALLIED III:FINANCIAL ACCOUNTING

ETP/IE Code: L S.Lr MBFP22ID1 Prerequisite : Basic knowledge in Accounting Practices 2 Ty 1 0 3

UNIT IV

Subject

UNIT V

UNIT III

Total No of Hrs: 45

09 Hrs

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Subject Code:	Subject I	Name: PRO	GRAMM	ING IN JA	VA	Ty /II	7 /Lb/ETP E	L	T/ S.Lr	P/R	C
CBCA22004	Prerequi	site : Basic	knowledge	e in C++ P	rogrammii	ng	Ту	3	1	0	4
L : Lecture T T/L/ETL : Th					ect R : Rese	earch C : Cre	edits		I		<u> </u>
OBJECTIV	ES										
To proTo intTo dev	ovide knowl roduce the J velop the kn	e basic conce ledge about Java Program nowledge in concepts Se	Constructonming con the advance	or, Inheritan cepts Packa ce concepts	ice and usa age, Interfa Applets an	ce and Exce d AWT.			•		
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CO2	Analyze t Programn	he reducing hing. The us use of Code	execution age of Inhe	time after i eritance in 1	1					5	
CO3	Achieve A classes, in using Exc	Abstraction a iterfaces and eption hand	and multip l sub packa ling mecha	le Inheritan Iges using a Inism.	a mechanisi	n Package.	Handling	un e	xpected	probl	
CO4		e interactive for a Java Pi			lications us	sing Applet.	To provid	le G	raphical	User	
CO5	each other	t Socket Pro r. Retrieve	remote file	es from ren	note server			to c	ommuni	cate v	vith
Mapping of			-								
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07]	PO8	Р	09
C01	3	2	3	3	3	2	3		3	,	2
CO2	2	3	3	1	2	3	1		2		3
CO3	3	2	2	2	3	3	2		3		3
CO4	3	3	3	1	1	3	1		1		3
CO5	2	3	3	3	2	3	3		2		3
Cos/PSOs	P	S01	P	S02	P	S03			PS04		
CO1		3		3		1			2		
CO2		2		3		2			3		
CO3		3		2		1			3		
CO4		3		3		2			3		
CO5		2		3		3			3		
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Category	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	t l	Practical Project/ nternship	oth	hers
						1	1	1			

TEXT BOOK:

1. Naughton, P & Schildt, H(1999) Java2 The Complete Reference (3rd ed.), TMH.

REFERENCES:

- 1. Cay S.Horstmann, Gary Cornell (2000) Core Java 2 Volume I Fundamentals (,5th ed.), PHI.
- 2. Arnold, K & Gosling, J(1996) The Java Programming Language(2nd ed.), Addison Wesley.

I/O Streams : File Streams - Applets - Working with windows using AWT Classes - AWT Controls - Layout Managers and Menus.

Packages & Interfaces : Access Protection - Importing Packages - interfaces - Exception Handling - Multithreading -Thread - Synchronization - Messaging - Runnable Interface - Inter thread Communication - Deadlock - Suspending,

Resuming and stopping threads.

UNIT IV 12 Hrs

UNIT V 12 Hrs

Network Basics : Socket Programming - Proxy Servers - TCP/IP Sockets - Net Address - URL - Datagrams

Introduction to Java : Features of Java - Object Oriented Concepts - Lexical Issues - Data Types - Variables - Arrays

Classes & Objects : Class – Objects-Methods- Constructors - Overloading methods - Access Control- Understanding

12 Hrs

Static - String Class - Objects - String Buffer - Char Array- Inheritance - Overriding methods - Using super- Abstract class - Java Utilities.

UNIT II

- Operators - Control Statements.

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab UNIT I 12 Hrs

CBCA22004 Prerequisite : Basic knowledge in C++ Programming

Subject Name: PROGRAMMING IN JAVA

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12 Hrs

Total No of Hrs: 60

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UNIT III

Subject

Code:

CALL STATES AND AND RESEARCH INSTITUTE DEMEND TO BE UNIVERSITY UNIVERSITY WING CREEGE ANTIONOMY SERVICE (An ISO 201001 : 2018 Cortificed Institution) Periyar E.V.R. High Boad, Maduravoyal, Chennai-95. Tamiinadu, India.

Subject Code:	Subject N	ame: CON	IPUTER	NETWOF	RKS	Ty/ IE	Lb/ETP/	L	T/ S.Lr	P/R	C
CBCA22005	Prerequisi	te : Basic l	knowledge	e in Netwo	rking		Ту	4	0	0	4
L : Lecture T :				• •	ct R : Resea	arch C : Cre	dits				L
T/L/ETL : The	•	mbedded 7	Theory and	l Lab							
OBJECTIVE	S										
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	about Medi								_		
·	ide the know	•	-	÷	·		•	nd l	Bus.		
	erstand the co	-	•	•		IEEE802.6	•				
COURSE OU	art the topics		P/IP Netw	ork and w	ww.						
Students comp	,	,	able to								
CO1				cept of Ne	tworking a	nd Characte	rizes and s	stan	dardizes	the	
				.	0	em using O					
CO2	Explore kn										atior
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CO3						ignals are c					r a
						for connect					
	systems to and token r		•		Irn Network	A Protocol 1	oken dus t	isea	to trans	mit da	ila
CO4					particular l	nardware de	stination u	sing	Switch	ing	
	Provide a s										I.
CO5						ess to pack			-		
	allow digita	U C	-	• •		·				•	
	TCP/IP Net										
Mapping of C			-							-	
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	09
CO1	3	2	3	2	2	2	2		2		2
CO2	3	3	2	3	1	3	3		1		3
CO3	3	3	3	1	3	2	1		3	,	2
CO4	3	3	3	2	3	3	2		3		3
CO5	3	3	3	3	2	3	3		2		3
Cos/PSOs	PS	501	P	S02	P	S03			PS04		
CO1		3		3		2			3		
CO2		2		3		1			3		
CO3		3		2		3			2		
CO4		3		2		1			3		
CO5		3		3		2	1.7		3		
Tata a anti-			<u> </u>		Ũ	h, 2- Mediu		<b>T T</b>	Den ati1	1	
Category I	H&S Pi	ogram core	Program Elective	Open elective	Skill enhancing	Interdisciplin ary/Allied	Skill component		Practical Project/	oti	ners
		,			elective		· · ·		nternship		
		$\checkmark$						1		1	

## **Total No of Hrs: 60**

## **TEXT BOOK :**

- 1. Behrouz and Forouzan(2001), "Data Communication and Networks", (2nd ed), TMH.
- 2. Tanenbaum A.S (2003), "Computer Networks", (4th ed), PHI.

## **REFERENCES:**

- 1. Jean Wairand (1998), "Communication Networks (A first Course)", (2nd ed.), WCB/ McGraw Hill8.
- 2. Olivier Bonaventure(2011), "Computer Networking : Principles, Protocols and Practice", The Saylor Foundation.
- 3. Iresh A. Dhotre, Vilas S. Bagad (2013), "Computer Networks An Illustrated Guide to Computer Networking", Technical Publications.

T/L/ETL : Theory / Lab / Embedded Theory and Lab

## **OBJECTIVES:**

- To introduce the basic concept of Computer Networks and OSI layers. •
- To learn about Media transmission and Perform with errors.
- To provide the knowledge about Multiplexing techniques, Ethernet and Token Ring and Bus.
- To understand the concepts of Switching techniques, FDDI and IEEE802.6.
- To impart the topics ISDN, TCP/IP Network and WWW.

UNIT I

Introduction to Computer Network - Protocols and standards - standards organizations - Topology - Transmission mode -Classification of Network - OSI Model - Layers of OSI Model.

## **UNIT II**

Media of Transmission - Guided Media - Unguided Media - Performance Types of Error - Error Detection - Error

Corrections.

## **UNIT III**

**UNIT IV** 

FDDI- IEEE 802.6-Circuit Switching - Packet Switching - Message switching - Connection Oriented and

Connectionless services.

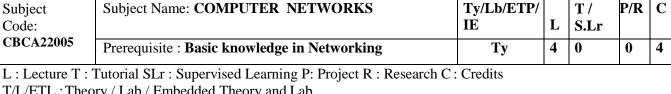
Analog and Digital Network-Access to ISDN - ISDN layers - TCP/IP Network- Transport and Application layers of TCP/IP-WWW.

Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet Token Bus - Token Ring.

UNIT V 12 Hrs

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TITUTE



## 12 Hrs

12 Hrs

## 12 Hrs

12 Hrs

# CONTROL OF 
Code: CBCA22006	U U	ame: <b>DAT</b> A					IE	L	~	P/R	C
	Prerequisit	te : <b>Basic k</b>	nowledge	e in Arrays	s, Structure	es & Pointer	s Ty	2	1	0	3
L : Lecture T T/L/ETL : The					ect R : Rese	earch C: Cree	lits				
OBJECTIVE	S										
<ul> <li>To intro</li> <li>To provisit.</li> <li>To und</li> </ul>	oduce the co vide knowled erstand the c	ncepts of a lge about F concepts Ar	rray, Reco Representa ray repres	rds and Point tion of Linl entation of	nters, Sortir ked list in m stacks & qu	nd Mathemating and Search emory, Trave neues and illu and learn me	ing metho ersing and istrate recu	ds. Sea ursi	arching on.	a linko	ed
COURSE OU		· /									
Students comp											
CO1	using Data	structures.				nctions to est			_		
CO2	giving appr	opriate solu	itions.	-		niques, conc			-		
CO3	available m	emory space	e and kno	wledge of	instances o	age collection f Structures gramming sk	and Class	tive tes t	ly utiliz that can	ing th be	e
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CO5						ns to arrive a Data struct					
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Mapping of (	Requisite k	nowledge	to give an	overall sol	ution using			ique		P	09
Mapping of (	Requisite k Course Outc	nowledge ome with	to give an <b>Program</b>	overall sol Outcome (	ution using <b>POs</b> )	Data struct	ure techni	ique	es.		<b>09</b>
Mapping of C Cos/POs	Requisite k Course Outc PO1	nowledge ome with PO2	to give an Program PO3	overall sol Outcome ( PO4	ution using POs) PO5	Data struct	P07	ique	es . PO8		
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Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2	Requisite k Course Outc PO1 3 3 2 3 2 2 PS 2 2 1	nowledge ( ome with ) PO2 3 3 2 1 3 01	Program Program Program Program Program PO3 3 3 1 2 3 Program PO3	overall sol       Outcome (       PO4       3       2       3       3       3       3       3       3       3       3       3       3       2       3       2	ution using POs) PO5 2 3 3 3 3 PS	PO6           2           2           3           1           2           503           3           2	P07           3           2           3           3           3		PO8         2         3         3         3         9         1         2         3         3         3         3         2         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3		2 2 3
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Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 CO5/PSOs CO1 CO2 CO3 CO3 CO4 CO4 CO5	Requisite k           PO1           3           3           2           3           2           3           2           3           2           3           2           3           2           3           2           3           2           3           2           1           1           2           3           3           2	nowledge ome with 1 PO2 3 3 2 1 3 01 2 1 3 01	Program P PO3 3 3 1 2 3 P	overall sol       Outcome (       PO4       3       2       3       3       3       3       3       3       3       3       3       3       3       2       3       2       3       2       3       2	ution using POs) PO5 2 3 3 3 9 9 0 0 0 0 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1	PO6           2           2           3           1           2           3           3           3           3           4           2           3           3           4           2           3           3           4           2           4           503           3           4           5           5           6           6           6           6           7           8           9           10           11           12           13           13           14           15	P07 3 2 3 3 3 3 3		PO8         2         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3         3		2 2 3

## **TEXT BOOK:**

Seymour Lipschutz(2011) Data Structures with C, Schaum's Oulines, Mcgraw Hill 1.

## **REFERENCE:**

1. Jeanpaul, Tremblay Paul & Sorenson, G(2007) An Introduction To Data Structure With Application(2nd ed.), Tata Mcgraw Hill.

Introductions and Overview: Basic terminology- Elementary data organization - Data structures-Data structure operations - ADT - Mathematical Notations and Functions

## **UNIT II**

**UNIT III** 

**UNIT IV** 

UNIT V

Subject

Array, Records And Pointers: Linear array, Representation of linear arraysin memory - Traversing linear arrays -Inserting and Deleting - Sorting methods (Selection, bubble, insertion) -Searching methods (Binary and linear search) – Multidimensional Arrays - Pointers - Pointer Arrays - Recod Structures - Representation of Records in memory.

Linked List: Representation of Linked list in memory – Traversing and Searching a linked list - Memory allocation -

Garbage collection - Insertion and deletion in linked list

Stacks, Queues, Recursion: Stacks - Array representation of stacks - Linked List Representation of Stacks - Arithmetic expression - Recursion - Queues - Linked Representation of Queues

Binary Trees - Representing Binary Tree in Memory - Traversing of binary trees - Header Nodes - Threaded Trees: Binary Tree – Binary Search Tree – Searching, Inserting and Deleting in a Binary Search Tree

	Code: CBCA22006		/ĚTP/ IE	L	S.Lr	
		Prerequisite : Basic knowledge in Arrays, Structures & Pointers	Ту	2	1	0
		Tutorial SLr : Supervised Learning P: Project R : Research C : Credi ory / Lab / Embedded Theory and Lab	ts			
U	I TIV					9 Hrs

Subject Name: DATA STRUCTURES

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## **Total No of Hrs: 45**

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## 9 Hrs

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## 9 Hrs

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CBCA2200 7	Prerequisit Creative t		knowledge	e in Compu	ter Science	and	Ту	2	1/0	0/0	3
L : Lecture T	: Tutorial SL		sed Learn	ing P: Proje	ct R : Resea	arch C : Cree	dits				
T/L/ETL : Th	neory / Lab / E	Embedded '	Theory an	d Lab							
OBJECTIV	ES										
• It's th	e application	of theories.	, methods,	Planning a	software pr	oject and D	evelopmen	t pr	ocess ar	nd too	ls to
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002	purpose of a			plaining an	u uesign e			10	commun	neute	inc
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## **TEXT BOOK:**

## 1. Roger S. Pressman (Fifth Edition) Software Engineering, Mc Graw Hill.

## **REFERENCES:**

- 1. Fairley, R(1997) Software Engineering Concepts, Tata McGraw-Hill.
- 2. 2., Jeff Tian, Software Quality Engineering, Student Edition, 2006, Wiley India

UNIT IV

UNIT V

**UNIT II** 

Subject

**CBCA2200** 

Code:

7

Concepts - coding.

9 Hrs **UNIT III** 

**Testing and Processes:** Software Testing – Test case design – White Box testing – Block box testing – Software testing strategies - Software life cycle.

**Dynamic Testing :** Verification and validation analyzing and reporting templates – Post implementation analysis – Functionality testing – Performance testing – Compatibility testing – Case study.

Software Quality Assurance: Concepts - Movement - Back ground- SQA activities - Software Review - Formal technical reviews. Statistical software quality assurance - Reliability.

**Total No of Hrs: 45** 

Development process – Organizational structure. Software cost factors: Estimation techniques – Staffing project: level estimation - Estimating software estimation costs.

Design Notations & Techniques: Software Requirements Definition: specification - Formal Specification. Software Design: Design Concepts – Modules and Modularization Criteria - Notation – Techniques. Implementation issues:

## UNIT I 9 Hrs Introduction to Software Engineering: Definition-size factor – quality and productivity factors. Planning a software

Prerequisite : Basic knowledge in Computer Science and

Creative thinking.

Subject Name: SOFTWARE ENGINEERING



## 9 Hrs

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9 Hrs

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Subject	Subject N	lame: <b>PRO</b>	GRAMM	ING IN JA	VA LABO	RATORY	Ty/Lb/	-	Τ/	P/R	С
Code:							ETP/IE	L	S.Lr		
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	Program					1 0 0		0	0	4	2
L : Lecture T T/L/ETL : The					ct R : Resea	rch C : Crec	lits				
OBJECTIVE	ES										
• To use	an integrate	d developm	ent enviro	nment to w	rite, compile	e, run, & tes	st simple o	bjec	ct		
	d Java progr							5			
• To imp	plement the p	rinciples of	packages	and string l	handling fui	nctions.					
• To dem	nonstrate the	concepts o	f Multithre	ading.							
• To dev	elop program	ns for file h	andling.								
	ign and deve		orograms u	sing AWT	controls.						
COURSE OU											
Students com						C' 1'	•			1. 1	
<b>CO1</b>		d sorting gi			e programs f	or finding a	rea, perim	eter	, prime	, displ	ay
CO2					handling fu	inctions like	ravarea r	onle		cat an	d
02	compare s			ment sunig	nanuning ru		1000180,1	epia	ace, con	cat all	u
	compare s	Demonstrate the concepts of Multithreading using Runnable Interface.									
CO3		te the conc	epts of Mu	ltithreading	g using Run	nable Intert	ace.				
CO3 CO4	Demonstra		-					Buf	ferInpu	tStream	n
CO3 CO4	Demonstra		-		g using Run ate a file an			Buf	ferInpu	tStream	n
	Demonstra Develop p class.	rograms for	file handl	ing like cre		d process a	file using		•		n
CO4	Demonstra Develop p class. Design and	rograms for 1 develop a	file handl	ing like cre ams using	ate a file an	d process a	file using		•		n
CO4 CO5 Mapping of (	Demonstra Develop p class. Design and Rectangle	rograms for l develop a and Square	file handl pplet progr Develop	ing like cre ams using code using	ate a file an AWT contr Form layou	d process a	file using		•		n
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Subject Code:	Subject Name: PROGRAMMING IN JAVA LABORATORY	Ty/Lb/ ETP/IE		T / S.Lr	P/R	С
CBCA22L03	Prerequisite : Basic knowledge in Object Oriented Programming	Lb	0	0	4	2
	Tutorial SLr : Supervised Learning P: Project R : Research C : Crec ry / Lab / Embedded Theory and Lab	lits				

- 1. Write a Java program to calculate Area and perimeter of a circle
- 2. Write a Java Program to Check if the given number is Prime or not
- 3. Write a simple Java program to Display Month of year using Calendar class
- 4. Write a java program to sort a given set of numbers.
- 5. Write a java program for handling string Functions a) Reverse b) Replace c) Concat d) Compare
- 6. Create New Thread Using Runnable interface in java.
- 7. Read File Using Java BufferedInputStream class
- 8. Draw Oval, Circle, Rectangle & Square using Applets
- 9. Write an applet Program for flowlayout
- 10. Create AWT controls for button, combobox, checkbox, Textfield using Java Applet.

Total no. of Hrs needed to complete the Lab: 60

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Subject Code:	Subject Name: LABORATO	DATA STRUC RY	TURES A	ND ALGO	RITHM	T/L/ ETL		]/ .Lr	P/R	C
CBCA22L0 7	Prerequisite : I	Knowledge in C	++ Progra	mming		Lb		/0	4/0	2
L : Lecture T		Supervised Lear bedded Theory a	•	oject R : Re	search C : C	redits				
OBJECTIV	ES									
<ul><li>To und</li><li>To imp</li><li>To pro</li></ul>	lerstand Selection, part the concepts o vide knowledge al	ncepts of Linear a Bubble and Insert f Stack and Arrays pout Queues and P ge in the Binary tre	tion Sorting s Pointers	Methods						
COURSE O	UTCOMES (Co	os)								
	pleting this cour									
CO1	Capable of imple	menting the search	n techniques	so as to rend	ler a faster so	olution.				
CO2	To utilize the diff	erent methods for	various sort	ing applicati	ons appropria	ately and ar	range ti	he dat	a in or	der.
CO3		ept of Arrays, Pus				hronize the	differe	ent ins	structio	ons
CO4 CO5	the memory that u	ept of Pointers by altimately leads to problem in Data s	faster execu	ition.				nform	ation f	ron
		-			ented program		cepts.			
Cos/Pos	PO1	e with Program	PO PO			DO	5		DO	-
COS/POS CO1	3	2	3	15	PO4	<b>PO</b>	5		PO6	)
			-		2				2	
CO2	3	3	3		1	3			3	
CO3 CO4	2	2	3						3	
1 1 14	1		2		2				1	
	2	3	3		1	3			1	
CO5	2 <b>PS01</b>	3	3				DS	504	1 3	
CO5 Cos/PSOs	PS01	3 <b>PS02</b>		PS03	1	3	PS	<b>504</b>		
CO5 Cos/PSOs CO1	<b>PS01</b> 2	3 <b>PS02</b> 3		3	1	3		1		
CO5 Cos/PSOs CO1 CO2	<b>PS01</b> 2 3	3 PS02 3 2		3	1	3		1 2		
CO5 Cos/PSOs CO1 CO2 CO3	PS01           2           3           1	3 <b>PS02</b> 3 2 3		3 3 2	1	3		1 2 3		
CO5 Cos/PSOs CO1 CO2	<b>PS01</b> 2 3	3 PS02 3 2		3	1	3		1 2		
CO5 Cos/PSOs CO1 CO2 CO3 CO4	PS01 2 3 1 3 3 3	3 <b>PS02</b> 3 2 3 3 2	3	$ \begin{array}{r} 3\\ 3\\ 2\\ \hline 2\\ \hline 3\\ \end{array} $	1 3	3 3		1 2 3 2		
CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	PS01 2 3 1 3 3 3	3 <b>PS02</b> 3 2 3 3 2 licates Strength (	3	$ \begin{array}{r} 3\\ 3\\ 2\\ \hline 2\\ \hline 3\\ \end{array} $	1 3	3 3 	V Prac	1 2 3 2 3 tical ject/		ers



Subject	Subject Name: DATA STRUCTURES AND ALGORITHM	T/L/	L	Τ/	P/R	С
Code:	LABORATORY	ETL		S.Lr		
CBCA22L0		Lb	0	0/0	4/0	2
7		20	v	0/0	., .	-

- 1. Implementation of Linear Search.
- 2. Implementation of Binary Search.
- 3. Implementation of Selection sorting method.
- 4. Implementation of Bubble sorting method.
- 5. Implementation of Insertion sorting method.
- 6. Implementation of PUSH and POP operations of a STACK using ARRAYS.
- 7. Implementation of INSERT and DELETE operations of a QUEUE using POINTERS.
- 8. Implementation of Binary Tree Traversals.
- 9. Implementation of Binary Search Tree (BST)
- 10. Implementation of INSERTING and DELETING nodes in Binary Tree.

Total No of Hrs needed to complete the Lab: 60

EDUCATIONAL AND RESEARCH INSTITUTE	a start
(An ISO 21001 : 2018 Certified Institution)	

(An ISO 21001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamilnadu, India.

Subject Code:	Subject Na DIGITAL			Ś			Гу/Lb/E ГР/IE	L T/ S.Lr	P/R	C
CBCA22ID1	Prerequisit	te : <b>Know</b> l	ledge of B	asic Electr	onics		Ту	2 1	0	3
L : Lecture T : T/L/ETL : Theo		<b>.</b>		0 0	ct R : Resea	arch C : Cre	dits	·		•
OBJECTIVES	5									
• To impa	duce differen art a great dea	al of Know	vledge in r	ninimizatio						
• To Unde	to understand erstand the se	equential d	ligital circ	uits like flip	o-flops, regi	ster				
	mine the cha		s of memo	ory and thei	r classificat	ion &differ	ent types o	f Counters		
COURSE OU			11 /							
Students compl CO1	Understand			on and con	varsion bot	voon diffor	nt roproso	ntations in	digital	1
cor	electronic c		epresentati				ent represe	intations in	uigita	L
CO2	Apply the B logic gates		nimizatio	n technique	s like K-ma	p method, l	Don't care	conditions	& diff	ferent
CO3	Implement Multiplexer				es for comb	inational cii	cuits such	as Adder,	Subtra	ctor,
CO4	Analyze log RS, JK, Ma						equential lo	ogic circui	ts such	as
CO5	Ability to ic Synchronou	•	-		• • •			· ·		ters,
Mapping of C			0					-		
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	09
CO1	3	2	3	3	2	2	3	2		2
CO2	2	3	2	1	3	3	1	3	,	3
CO3	3	3	1	2	3	3	2	3		3
CO4	3	3	3	2	3	3	2	3	,	3
CO5	3	2	2	3	1	3	3	1		3
Cos/PSOs	PS	01	P	<b>PS02</b>	P	S03		<b>PS04</b>		
CO1	3			3		2		2		
CO2	2	,		3		1		3		
CO3	3			2		3		1		
CO4	3			3		2		3		
CO5	2			3		3		3		
	3/2/1	Indicates	Strength C	of Correlation	on, 3 – Hig	h, 2- Mediu				
Category H	I&S Pro	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Practical Project/ Internship	oth	ners
								1	1	

**TEXT BOOKS:** 

Thomas L.Floyd & R.P. Jain, (2009), Digital Fundamentals (8th ed.), Pearson Education 2.

## **REFERENCE:**

1. Bartee, T, C(1991) Computer Architecture and logical Design McGraw Hill,

Sequential logic : Flip flops : RS, JK, Master-Slave flipflop, D and T Flip flops - Registers - Shift Registers - Types of shift registers : SIPO, SISO, PISO, PIPO.

Couters and Memory : Counters - Ripple Counters - Synchronous Counter-asynchronous counter, Up/down

Binary Systems : Digital Computers and Digital Systems - Binary Numbers - Number Based Conversions - Octal and Hexadeciamal Numbers - Complements - Binary codes - Binary logic

Logic Gates and Simplification of Boolean Functions : Digital Logic Gates - Truth tables. K- map method (upto 5 Variables) – Product of Sums Simplifications – Don't Care Conditions - Mc-Clausky Tabulation method.

Combinational Logic : Adders - Subtractors - Decoders - Encoders - Multiplexer - Demultiplexer - Design of Circuits using decoders/Multiplexers - ROM - PLA (Programmable Logic Array)- PAL(Programmable Array Logic).

synchronous counters, Cascaded counters -Basics of Memory- RAM-ROM-PROM-EPROM

Morris Mano, M(1984), Digital Logic and Computer Design(2nd ed.), Prentice Hall of India 1.

Subject Name: Allied IV: P/R C Subject Ty/Lb/E Τ/ Code: **DIGITAL FUNDAMENTALS** TP/IE L S.Lr CBCA22ID1 Prerequisite : Knowledge of Basic Electronics 2 Ty 1 0 L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab UNIT I 9 Hrs

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# UNIT III

**UNIT II** 

## **UNIT IV**

UNIT V

#### Total No of Hrs: 45

## 9 Hrs

9 Hrs

9 Hrs

9 Hrs

3



CBCA22008 Prerequisit L : Lecture T : Tutorial SLa T/L/ETL : Theory / Lab / E OBJECTIVES • To introduce VB con • To impart the basic of • To provide knowled Do Events and Sub D • To illustrate the cond • To familiarize the cond	r : Supervis mbedded T ntrols, Data concepts of ge about (C Main, Erro cepts VB F oncepts of f Cos) ourse were owledge of e VB Progr nd Procedu rojects with Apply these the usage c nDemonstr abase conne- ted with fre-	sed Learni Theory and a types and f loops and Control Ar or Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI <b>Program (</b>	ng P: Proje 1 Lab d to create s d functions rays, Comb g DI forms an connectivity a simple V e time to ex- Displaying I forms. Ana in the VB p MDI forms ting proble implement B form and <b>Dutcome</b> (1)	simple VB f bo Boxes, G d testing in y and to inc B form and cecute same nformation alyze the Do orogram. . Achieve the ms as early s this in VB back end or	arch C : Crea form. Form. WB. culcate the u making use e set of codin and execute o Events and he knowledg as possible forms. Usin	dits Projects w sage of har of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror d
T/L/ETL : Theory / Lab / E         OBJECTIVES         • To introduce VB control         • To provide knowled Do Events and Sub P         • To illustrate the control         • To familiarize         • CO1       Applying product         • Co1       3         • CO2       3         • CO3	mbedded T ntrols, Data concepts of lge about ( Main, Erro cepts VB F oncepts of 1 Cos) ourse were owledge of e VB Progrand rojects with Apply these the usage of nDemonstra abase conne- ted with fra-	Theory and a types and f loops and Control Ar or Trapping Forms, MD Database of able to f creating a ram to sav ures also D h multiple concepts of Menus, rate the tes ectivity to ont end VI <b>Program (</b>	d to create s d functions rays, Comb D forms an connectivity a simple V e time to ex Displaying l forms. Ana in the VB p MDI forms ting proble implement B form and <b>Dutcome</b> (1)	simple VB f bo Boxes, G d testing in y and to inc B form and cecute same nformation alyze the Do orogram. . Achieve the ms as early s this in VB back end or	Form. Frid Control, VB. culcate the u making use set of codin and execute be knowledg as possible forms. Usin	Projects w sage of har of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror d
OBJECTIVES         • To introduce VB colspan="2">• To impart the basic of the ba	ntrols, Data concepts of lge about C Main, Erro cepts VB F oncepts of I Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage of nDemonstra- base conne- ted with fre- ome with F	a types and f loops and Control Ar or Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple e concepts of Menus, rate the tes ectivity to ont end VI <b>Program (</b>	d to create s d functions rays, Comb DI forms an connectivity a simple V e time to ex Displaying I forms. Ana in the VB I MDI forms ting proble implement B form and <b>Dutcome</b> (1)	bo Boxes, G d testing in y and to inc B form and accute same information alyze the Do program. . Achieve the ms as early s this in VB back end of	brid Control, VB. culcate the u making use e set of codin and execute o Events and he knowledg as possible forms. Usin	of VB cont of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror d
<ul> <li>To introduce VB control</li> <li>To impart the basic of the basic</li></ul>	concepts of lge about ( Main, Erro cepts VB F oncepts of 1 Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage of nDemonstra- base conne- ted with fre- ome with F	f loops and Control Ar or Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI Program (	d functions rays, Comb g DI forms an connectivity a simple V e time to ex Displaying I forms. Ana in the VB I MDI forms ting proble implement B form and <b>Dutcome</b> (1)	bo Boxes, G d testing in y and to inc B form and accute same information alyze the Do program. . Achieve the ms as early s this in VB back end of	brid Control, VB. culcate the u making use e set of codin and execute o Events and he knowledg as possible forms. Usin	of VB cont of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror
<ul> <li>To impart the basic of To provide knowled Do Events and Sub Period To familiarize the content of To familiarity o</li></ul>	concepts of lge about ( Main, Erro cepts VB F oncepts of 1 Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage of nDemonstra- base conne- ted with fre- ome with F	f loops and Control Ar or Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI Program (	d functions rays, Comb g DI forms an connectivity a simple V e time to ex Displaying I forms. Ana in the VB I MDI forms ting proble implement B form and <b>Dutcome</b> (1)	bo Boxes, G d testing in y and to inc B form and accute same information alyze the Do program. . Achieve the ms as early s this in VB back end of	brid Control, VB. culcate the u making use e set of codin and execute o Events and he knowledg as possible forms. Usin	of VB cont of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror
<ul> <li>To provide knowled Do Events and Sub I</li> <li>To illustrate the con- To familiarize the con- To familiarize the con- Students completing this con- COURSE OUTCOMES ( Students completing this con- CO1 Develop kn</li> <li>CO2 Evaluate the Functions a</li> <li>CO3 Applying priming. A</li> <li>CO4 Implement optimization</li> <li>CO5 Create Data will connect</li> <li>Mapping of Course Outcon- Cos/POs PO1</li> <li>CO1 3</li> <li>CO2 3</li> <li>CO3 3</li> <li>CO4 2</li> <li>CO5 3</li> <li>Cos/PSOs PSOs PS</li> </ul>	lge about C Main, Erro cepts VB F oncepts of 1 Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage c nDemonstra abase conne- ted with free ome with H	Control Ar or Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI Program (	rays, Comb g DI forms an <u>connectivit</u> a simple V e time to ex Displaying I forms. Ana in the VB p MDI forms ting proble implement B form and <b>Dutcome</b> (1)	bo Boxes, G d testing in y and to inc B form and accute same information alyze the Do program. . Achieve the ms as early s this in VB back end on	VB. culcate the u making use set of codin and execute be knowledg as possible	of VB cont of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	ror d
Do Events and Sub I• To illustrate the content• To familiarize the content• COURSE OUTCOMES ( Students completing this content optimization)• CO2Evaluate the Functions a• CO3Applying prime Trapping. A• CO4Implement optimization)• CO5Create Data will connect• Mapping of Content Cos/POs901• CO13• CO23• CO33• CO42• CO53• CO53• CO53• CO55	Main, Erro cepts VB F oncepts of f Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage of nDemonstra base connected with fra- ome with H	r Trapping Forms, ME Database of able to f creating a ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI <b>Program (</b>	2 DI forms an connectivity a simple V e time to ex Displaying I forms. Ana in the VB I MDI forms ting proble implement B form and <b>Dutcome</b> (1)	d testing in y and to inc B form and accute same nformation alyze the Do program. . Achieve the ms as early s this in VB back end or	VB. culcate the u making use set of codin and execute be knowledg as possible	of VB cont of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	idling files rols. 7 times usin structures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	or d
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COURSE OUTCOMES ( Students completing this completing this completing this completing this completing this completing this complete the second se	Cos) ourse were owledge of e VB Progrand Procedu rojects with Apply these the usage of nDemonstration base connected with free ome with H	able to f creating ram to sav ures also E h multiple concepts of Menus, rate the tes ectivity to ont end VI <b>Program</b> (	a simple V e time to ex Displaying l forms. And in the VB p MDI forms ting proble implement B form and <b>Dutcome</b> (1)	B form and accute same nformation alyze the Do program. . Achieve the ms as early s this in VB back end on	making use e set of codin and execute b Events and he knowledg as possible f forms. Usin	of VB cont ng for many e Looping S I Sub main ge of Testin using Integ	rols. 7 times usin 5tructures. concepts a g, Debugg ration testi	ng nd Err ing an ing.	d
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Cos/POs         PO1           CO1         3           CO2         3           CO3         3           CO4         2           CO5         3           Cos/PSOs         PS		8		POs)					
CO1       3         CO2       3         CO3       3         CO4       2         CO5       3         Cos/PSOs       PS	DO1								
CO2         3           CO3         3           CO4         2           CO5         3           Cos/PSOs         PS	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO	19
CO3         3           CO4         2           CO5         3           Cos/PSOs         PS	2	3	3	2	2	3	2	2	
CO4         2           CO5         3           Cos/PSOs         PS	2	3	1	1	3	1	1	3	;
CO53Cos/PSOsPS	3	3	2	3	3	2	3	3	;
Cos/PSOs PS	3	3	2	1	3	2	1	3	;
	3	2	3	2	3	3	2	3	;
<b>CO1</b> 3	01	Р	S02	PS	803		<b>PS04</b>		
	3		3		3		2		
<b>CO2</b> 2	2		2		2		3		
<b>CO3</b> 3	3 3 1					3			
<b>CO4</b> 3	3		3		2		3		
<b>CO5</b> 3	3		1		3	2			
3/2/1	Indicates S	Strength C	of Correlati	on, 3 – Higł	h, 2- Mediui	m, 1- Low			
Category H&S Pr	1						Practical	1	
	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Project/ Internship	oth	ers

## **TEXT BOOKS:**

- 1. Gary Cornell(1999) Visual Basic 6 from the Ground up, Tata McGraw Hill.(I IV Units)
- 2. Gary Bronson, Introduction to programming Using Visual Basic 6, Dreamtech publications, II Edition(Vth Unit)

#### **REFERENCES:**

1. Noel Jerke (1999) Visual Basic 6 The Complete Reference Tata McGraw Hill .

(An Periyar E.V.R. Hi adu, India. Subject Name: VISUAL PROGRAMMING Ty/Lb/ ETP/IE L

EDUCA

#### **CBCA22008** Prerequisite : Basic knowledge in Programming & MS Access 3 Ty 1 0 4 L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

#### UNIT I

Subject

Code:

Customizing a Form : Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button -Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types -String - Numbers.

Loops and Functions: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures .

Arrays: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - Do Events and Sub Main - Error Trapping.

VB Objects: Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization -Working with Graphics.

Database programming with VB: Record set – Data control-Using the visual data manager – Entering data – Validating data - Accessing fields and record sets - Monitoring Mouse activity - File Handling - File System Controls -File System Objects.

UNIT II

UNIT III

UNIT IV

UNIT V

#### **Total No of Hrs: 60**

12 Hrs

12 Hrs

12 Hrs

12 Hrs

### 12 Hrs

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Subject Code: CBCA22009	Subject Na	ame: DAI	ABASE N	IANAGEN	VIENI		Ty/L b/ET P/IE	L	T / S.L r	P/R	С
	Prerequisi System	te : <b>Databa</b>	ise Manag	gement Sys	stem and O	perating	Ту	3	1	0	4
L : Lecture T	: Tutorial SI	r : Supervi.	sed Learni	ng P: Proje	ect R : Rese	arch C : Cre	dits			•	
T/L/ETL : The	eory / Lab / I	Embedded '	Theory and	d Lab							
OBJECTIVE	ES										
• To intr	oduce the ba	sic concept	ts of DBM	S and its P	rinciples.						
	cuss about th					-	s.				
	ure the Data	•••									
	ine the Index	-	-		-						
	cribe PL/SQ		control the	structure of	of database	and then the	Triggers	•			
COURSE OU			abla ta								
Students comp CO1					Palational D	ata base and	Deletion	01 01	achro		
CO1 CO2									•		
	DDL,DML			ong updat	e, insert, de	lete, drop ar	id select c	comi	nands t	using	
CO3						like Unique				two or	mor
~~ (						ore some B		ictio	ns.		
CO4	Provide kno	owledge in	Index, Vie	ews, Seque	nce and Syr	onyms in S	QL.				
CO5	Combine S and perform					lg Language	s using P	L/SO	QL prog	gramm	ing
Mapping of (											
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	<b>P07</b>		PO8	P	19
		-		_			107		100		
CO1	3	2	3	3	2	2					
CO2					2	2	3		2	2	2
	3	3	3	1	2	3	3		2 2	2	
CO3	3 3		3	1 2							3
		3			2	3	1		2	3	3
CO3	3	3 2	1	2	2 3	3 3	1 2		2 3		3 3 3
CO3 CO4	3 3	3 2 3 3	1 3 2	2 2	2 3 1 2	3 3 3	1 2 2		2 3 1		3 3 3
CO3 CO4 CO5	3 3 3	3 2 3 3 01	1 3 2 Pt	2 2 3	2 3 1 2 PS	3 3 3 3	1 2 2		2 3 1 2		3 3 3
CO3 CO4 CO5 Cos/PSOs	3 3 3 PS	3 2 3 3 01	1 3 2 Pt	2 2 3 <b>S02</b>	2 3 1 2 PS	3 3 3 3 3 3 3 3 3 3 3 3 3 3	1 2 2		2 3 1 2 <b>PS04</b>		3 3 3
CO3 CO4 CO5 Cos/PSOs CO1	3 3 3 PS	3 2 3 3 01 3 3	1 3 2 Pt	2 2 3 <b>S02</b> 3	2 3 1 2 PS	3 3 3 3 <b>603</b> 2	1 2 2		2 3 1 2 <b>PS04</b> 2		3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4	3 3 3 PS	3 2 3 3 01 3 3 3 3 3 3 3	1 3 2 Pt	2 2 3 <b>S02</b> 3 2 3 3	2 3 1 2 PS	3 3 3 3 3 3 3 3 1 2	1 2 2		2 3 1 2 <b>PS04</b> 2 3 3 1		3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 3 PS	3 2 3 3 01 3 3 3 3 3 3 3 3 2	1 3 2 Pt	2 2 3 <b>S02</b> 3 2 3 3 3 3	2 3 1 2 PS	3 3 3 3 603 2 3 1 2 3	1 2 3		2 3 1 2 <b>PS04</b> 2 3 3		3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 3 PS 3 3 3 3 3 3 2 3 2 2 3/2/1	3 2 3 3 01 3 3 3 3 3 3 2 1 1 0 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1 3 2 Pt Strength Q	2 2 3 <b>S02</b> 3 2 3 3 3 3	2 3 1 2 PS	3 3 3 3 3 3 3 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 3 1 2 3 3 1 3 3 3 3	1 2 3 	1	2 3 1 2 <b>PS04</b> 2 3 3 1 2		3 3 3
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 3 PS 3 3 3 3 3 3 2 3 2 2 3/2/1	3 2 3 3 01 3 3 3 3 3 3 3 3 2	1 3 2 Pt	2 2 3 <b>S02</b> 3 2 3 3 3 3	2 3 1 2 PS	3 3 3 3 603 2 3 1 2 3	1 2 3	/ P. F	2 3 1 2 <b>PS04</b> 2 3 3 1		3 3 3

## **TEXT BOOK:**

Subject

operations.

**UNIT III** 

**UNIT IV** 

1. Jose A Ramalho(2000), Oracle 8i, BPB Publications

## **REFERENCES:**

Bipin C. Desai (1997), An Introduction To Database Systems, West Publishing Company. 1. Ivan Bayross Sql, *Pl/Sql The Programming Language Of Oracle*(2nd ed.), Bpb Publications

UNIT V 12 Hrs

More on SQL: Data Integrity : types of integrity , integrity constaints, NOT NULL, UNIQUE, Primary KEY, CHECK Constraints - Oracle Dual Table - Oracle Built in Function - Union, Intersect, Minus,

**UNIT II** 12 Hrs

SQL Language Basics : Oracle & Client-Server Technology - types of SQL Declarations – DDL - DML - SELECT command - data types - Expressions and Operators- Types of Operators - Precedence of Operators-.

SQL Performance Tuning: Indexes : creating indexes, changing an index, eliminating an Index - Views : properties and privileges of view, creating view, deleting a view – Sequences : creating, changing, deleting sequence, synonyms : creating, renaming, removing a synonyms

Introduction to PL/SQL: Introduction - The Generic PL/SQL Block - How PL/SQL works-control structures, Stored Procedures and Functions - Database Triggers - types of triggers - creating, modifying and deleting a trigger -Introduction to Cursor

Subject Name: DATABASE MANAGEMENT

UNIT I Introduction and Basic Concepts: Structure of DBMS - Advantages and Disadvantages of DBMS - Relational Database: attributes & domains, tuples, relations and their schemes - Integrity rules - Relational Algebra: basic

#### b/ET Code: L S.L **CBCA22009** P/IE r Prerequisite : Database Management System and Operating 3 Тy 1 0 4 System L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab 12 Hrs



# 12 Hrs

12 Hrs

C

P/R

Τ/

Ty/L

## Total No of Hrs: 60



		Subje	ect Name	e: Dis	tributed	l Comp	uting		Ty/Lb/	L	Τ/	P/ R	С
SubjectCode:									ETL/IE		S.Lr		
CBCA22016		Prere	quisite : 1	NIL					Ту	3	0	0	3
L	: Lect	ture T : Tu	ıtorial						R : Reseat		Credits		
OBJECTIV													
		expose stu							ems.				
		introduce focus on p											
	10	locus oli p						(3-5)					
CO1		-						<i>·</i> · ·					
		To expos	se studen	ts to bo	th the al	ostractio	on and c	details of	f file syste	ems.			
CO2		To intro	luce con	cepts rel	lated to	distribu	ited con	nputing	systems				
CO3		To focus	on perfo	ormance	and fle	xibility	issues 1	related to	o systems				
		Map	ping of C	Course	Outcon	nes witl	n Progr	ram Out	tcomes (P	Os)			
COs/POs	PO	D1 PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	) PO11	P	012
CO1	2		2	3	1	2	1	1	1	1	1		1
CO2	3	2	2	3	1	3	1	1	1	1	1		1
CO3	3	3	1	3	2	2	1	1	1	1	1		1
COs / PSOs		PSO1	]	PSO2	]	PSO3		PSO4	PSO5				
CO1		3	2			3		1	2				
CO2		3	(r)			2		1	3				
CO3		3	2		-	2		1	3				
	1	H/M/L in	ndicates S	Strength	of Cor	relation	H- H	ligh, M-	Medium,	L-Low			
ory	H&S	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplinary/Allied	Skill component		others				
Category													
Approval				1	1	1	1	1 L				1	

## UNIT I Distributed Computing Fundamentals

Introduction to distributed computing system, Evolution, Different models, Definition, Issues in design, DCE, Message passing-Introduction, Desirable features of a good message passing system, Issues in IPC, Synchronization, Buffering, Multidatagram, Process addressing, Failure handling.

### UNIT II Remote Procedure Call

SubjectCode:

**CBCA22016** 

Introduction, RPC model, transparency of RPC, Implementing RPC mechanism, Stub generation, RPC messages, Marshalling arguments and results, Sever management, parameter-passing semantics, Call semantics, Communication protocols for RPCs, Complicated RPC, Client-server binding, exceptional handling.

### UNIT III Distributed Shared Memory and Synchronization

Subject Name :

Prerequisite : NIL

Introduction, General architecture of DSM systems, Design and implementation issues of DSM, Granularity, Structure of shared memory space, Consistency model, Replacement strategy, Thrashing, Different approaches to DSM, Advantages of DSM, Clock synchronization, Event ordering, Mutual exclusion, Deadlock, Election algorithm.

UNIT IV Resource and Process Management

Introduction, Desirable features of a good global scheduling algorithm, Task assignment approach, Load balancing approach, Load sharing approach, Process migration, Threads.

UNIT V Distributed File Systems and Naming

Desirable features of good DFS, File models, File accessing, models, File sharing semantics, File caching schemes, File replication, Fault tolerance, Naming - Desirable Features of a Good Naming System, Fundamental Terminologies and Concepts, Systems-Oriented Names, Name caches, Naming & security.

## Total Hours: 45

#### **TEXT BOOK:**

1. Pradeep K. Sinha (2012 Reprint), Distributed Operating System Concepts and Design PHI

#### **REFERENCE BOOKS:**

1. Andrew S. Tenenbaum (2012), Modern Operating System (3rd ed.) PHI

2. Ajay D. Kshemkalyani , Mukesh Singhal (2008), Distributed computing : principles, algorithms and systems – Cambridge University Press

3. Andrew S. Tenenbaum & Maatren Vansteen (2012) Distributed systems: Principles & Paradigms (2nd ed.),PHI

4. Hagit Attiya And Jennifer Welch (2004) Distributed computing fundamentals, simulations and Advanced Topics (Digitized in 2007) (2nd ed.), Wiley

5. Jean Dollimore, Tim Kindberg, And George Coulouris (2005) Distributed Systems: Concepts and Design (4th ed.) Pearson Education



**Distributed Computing** 

9 Hrs

9 Hrs

9 Hrs

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P/R

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3

Tv/Lb/

ETL/IE

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3

9 Hrs

9 Hrs



(An ISO 210	01 : 2018 Ce	rtified Instit	ution)
Periyar E.V.R. High Road,	Maduravoyal,	Chennai-95.	Tamilnadu, India.

Subject Code:	Subject	Subject Name: VISUAL PROGR		RAMMING	G LABORA'	FORY	T/L/ ETL	L	T / SLr	P/R	C
CBCA22L0	Prerequi	isite · <b>The</b> c	oretical Kno	wledge in	Visual Bas	ic		0	0/0	4/0	2
8								v	0/0	-1/U	-
L : Lecture T T/L/ETL : T					oject R : Re	search C : C	redits				
OBJECTIV	<b>'ES</b>										
<ul> <li>To im</li> <li>To proand Su</li> <li>To uno</li> </ul>	part the bas ovide knowl ub Main, Er derstand the	ic concepts ledge about ror Trapping e concepts N	ta types to cr of loops and t Control Array g. IDI forms and ectivity with	functions. ys, Combo B 1 implement	Boxes, Grid C	g in VB.				Do E	vents
COURSE O											
Students con				· · · · · 1. VD	<u></u>	VD		1.0	D.	1	
C01		e e	e of creating a	Ĩ	e		•		U		
CO2		0	ram in the pro		•					Displa	ayıng
CO3	Applying p Apply thes	rmation and Looping Structures. These concepts will give the standardized form of a coding lying projects with multiple forms. Analyze the Do Events and Sub main concepts and Error Trappin ly these concepts in the VB program to get the in the forms of Library information system and Studer mation system.									
CO4	Using the has been c directory r	following st reated concernaintenance		ng, defining e tax process	, designing, sing system,	building, test Electricity bi	ing and dep ill preparat	oloyr ion s	nent entir ystem and	e proj d Tele	ect pho
CO5	Processing	g and view the	ectivity to implet to implet to a terminate the saved data	in future		s. In which d	lata using i	n th	e project	Mark	shee
Mapping of	Course O	utcome w	ith Progran	n Outcome	e (POs)						
Cos/POs	PC	01	PO2	PO	13	PO4	PO	5		PO6	
CO1	3		2		5						5
000	2		2	3	15	2	3			2	<b>j</b>
CO2	3		3	3		2 1	3			3	j <u> </u>
CO3	3		3 2	3		2 1 2	3 3 2			3 3	<u>,</u>
CO3 CO4	3		3 2 3	3 2 3		2 1 2 1	3 3 2 1			3 3 3	<b>j</b>
CO3 CO4 CO5	3 3 2		3 2 3 3	3		2 1 2	3 3 2			3 3	<b>.</b>
CO3 CO4 CO5 Cos/PSOs	3 3 2 <b>PS0</b>	)1	3 2 3 3 <b>PS02</b>	3 2 3	PS03	2 1 2 1	3 3 2 1		PS04	3 3 3	j
CO3 CO4 CO5 Cos/PSOs CO1	3 3 2 <b>PS0</b> 3	)1	3 2 3 3 <b>PS02</b> 3	3 2 3		2 1 2 1	3 3 2 1		2	3 3 3	<u> </u>
CO3 CO4 CO5 Cos/PSOs	3 3 2 <b>PS0</b>	)1	3 2 3 3 <b>PS02</b>	3 2 3		2 1 2 1	3 3 2 1			3 3 3	
CO3 CO4 CO5 Cos/PSOs CO1	3 3 2 <b>PS0</b> 3	)1	3 2 3 3 <b>PS02</b> 3	3 2 3	<b>PS03</b>	2 1 2 1	3 3 2 1		2	3 3 3	· · · · · · · · · · · · · · · · · · ·
CO3 CO4 CO5 Cos/PSOs CO1 CO2	3 3 2 <b>PS0</b> 3 2 3 3 3	)1	3 2 3 3 <b>PS02</b> 3 3 2 3	3 2 3	PS03 1 2 1 2 1 2	2 1 2 1	3 3 2 1		2 3 3 3	3 3 3	
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 2 <b>PS0</b> 3 2 3 3 2 2		3 2 3 3 <b>PS02</b> 3 3 2 3 3 3	3 2 3 3	PS03 1 2 1 2 3	2 1 2 1 3	3 3 2 1 2		2 3 3	3 3 3	
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 2 PS0 3 3 2 3 3 3 3 3/	2/1 Indicat	3 2 3 3 <b>PS02</b> 3 3 2 3 3 es Strength	3 2 3 3 3 Of Correlat	PS03 1 2 1 2 3 tion, 3 – Hig	2 1 2 1 3	3 3 2 1 2		2 3 3 3 3 3	3 3 3 3	
CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 2 <b>PS0</b> 3 2 3 3 3 3 3/		3 2 3 3 <b>PS02</b> 3 3 2 3 3 es Strength	3 2 3 3	PS03 1 2 1 2 3	2 1 2 1 3	3 3 2 1 2		2 3 3 3	3 3 3 3	hers



Subject	Subject Name: VISUAL PROGRAMMING LABORATORY	T/L/	L	Τ/	P/R	С
Code:		ETL		SLr		
CBCA22L0		L	0	0/0	4/0	2
8		Ľ	v	0/0	-170	-

#### Creation of a Database and performing the operations given below using a Menu Driven Program.

#### a) Insertion b) Deletion c) Modification d) Generating a Simple report for the following:

- 1. Payroll.
- 2. Saving Bank account for banking.
- 3. Inventory System.
- 4. Invoice system.
- 5. Library information system
- 6. Student information system
- 7. Income tax processing system.
- 8. Electricity bill preparation system.
- 9. Telephone directory maintenance
- 10. Mark sheet Processing. With Connectivity

#### Total no. of Hrs. needed to complete the Lab: 60

# Control Contro

Subject	Subject Na		ABASE N		MENT	aud, mula.	Ty/Lb/E		Τ/	P/R	С
Code:	LABORA						TP/IE		S.Lr		Ŭ
CBCA22L04	Prerequisi	te : Should	d be comfo	ortable wit	h the relat	ional model					
	SQL, and	the basic	functions	of databas	se systems.		Ĺb	0	0	4	4
L : Lecture T		·			ect R : Rese	earch C : Cre	edits				
T/L/ETL : The	•	Embedded	Theory and	d Lab							
OBJECTIVE	ES										
	RDBMS to		, manage, o	query, and	retrieve da	ta.					
	vide data int	0									
	nonstrate the	<u> </u>		· ·				. 1			
• To mer inferen	rge the fact re		d file mana		elds in prepa	aration for th	ne addition	at a l	later ti	me of	
				worra.							
COURSE OU Students com			a abla to								
CO1				various data	n model use	d in databas	e design EF	R mo	dellin	g con	cent
	and archited		·			u III uutuous	e design Ei	• 1110	aeiiii	5 com	opu
CO2						d optimizati	on and also	dem	onstra	ate the	;
	basic of que	ery evaluat	tion.								
CO3	apply relati	onal datab	ase theory	and be able	e to describ	e relational a	algebra exp	ressi	on, tu	ple an	d
	domain rela						0 1				
CO4	apply and re	elate the co	oncept of t	ransaction.	concurrenc	y control an	d recoverv	in da	atabas	e.	
CO5			•			•	•				
CO5			-			e of query a	nd data upd	late p	oroble	ms.	
Mapping of (			-			DOC			0.0		00
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	P	<b>'08</b>	P	09
CO1	3	2	3	3	2	3	3		2		3
CO2	2	2	3	1	2	3	1		2		3
CO3	3	2	2	1	3	3	1		3		3
CO4	3	3	3	2	1	3	2		1		3
CO5	2	3	2	3	3	3	3		3		3
Cos/PSOs	PS	01	Р	S02	Р	<b>S03</b>		Р	S04		
C01	3	3		3		2			2		
CO2	2	2		2		1			3		
CO3	3	3		3		3			2		
CO4	3	;		3		2			3		
CO5	3	3		2		2			3		
	3/2/1	Indicates	Strength C	Of Correlati	on, 3 – Hig	h, 2- Mediu	m, 1- Low				
Category I		ogram core	Program	Open	Skill	Interdisciplin	Skill		ctical	otl	hers
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								me	$\frac{118111p}{}$	1	



Subject Code:	Subject Name: DATABASE MANAGEMENT LABORATORY	Ty/Lb/E TP/IE		T / S.Lr	P/R	С
CBCA22L04	Prerequisite : Should be comfortable with the relational model, SQL, and the basic functions of database systems.	Lb	0	0	4	2
	Tutorial SLr : Supervised Learning P: Project R : Research C : Cred ory / Lab / Embedded Theory and Lab	lits				

### 1. SQL BASICS :

- 1. DDL Create, Alter, Drop.
- 2. DML-Update ,Insert,Delete.
- 3. DRL-Select.

#### 2.VIEWS

3.INTEGRITY CONSTRAINTS- Naming Constraints.

4.SUB QUERIES- Nested, Complex.

**5.SQL FUNCTIONS**-Built in functions.

#### **6.SET OPERATIONS**

7. PL/SQL-Factorial ,Fibonacci Series.

Total no. of Hrs needed to complete the Lab: 60



Subject Code: HBFL22IXX	Subject Name: FOREIGN LANGUAGE	Ty/Lb/ ETP/IE	L	T/ S.L r	P/R	С
	Prerequisite : NIL	Lb	0	0	2	1
	Tutorial SLr : Supervised Learning P: Project R : Research C : Creatry / Lab / Embedded Theory and Lab	lits	1	1		1

Foreign language is introduced in the curriculum to make the students globally employable. Students should select and register for any one of the foreign languages from the given list. At the end of the course students should be able to read, write and converse the language in the basic level. At the end of the semester the assessment will be done through internal examination by the examiner duly appointed by the head of the department.

S.NO	COURSE CODE	COURSE NAME
1	EBFL22I01/HBFL22I01	FRENCH
2	EBFL22I02/ HBFL22I02	GERMAN
3	EBFL22I03/ HBFL22I03	JAPANESH
4	EBFL22I04/HBFL22I04	ARABIC
5	EBFL22I05/ HBFL22I05	CHINESE
6	EBFL22I06/HBFL22I06	RUSSIAN
7	EBFL22I07/HBFL22I07	SPANISH



Subject Code: CBCA22010		Name: <b>PRO</b>					Ty/Lb/ ETP/IE		T/ S.L r	P/R	C
	Prerequi	site : Basic	Knowledg	ge in C and	C++ Prog	ramming	Ту	3	1	0	4
L : Lecture T T/L/ETL : Th		<b>.</b>		0 3	ect R : Rese	earch C : Cre	edits		•		
OBJECTIV	ES										
<ul> <li>statem</li> <li>To int</li> <li>To progra</li> <li>To und</li> </ul>	ents in Pyt roduce the ovide know ums. derstand the niliarize ob <b>UTCOME</b> pleting this Understan keywords Capable of	concepts of t ledge about e file concep ject-oriented <b>S (Cos)</b> <u>s course were</u> nd the basic <u>s, looping sta</u> of understand	functions a lists, tuple ts in Pytho <u>l concepts</u> <u>e able to</u> <u>concepts o</u> <u>tements, c</u> d the funct	and pass arg s, indexing on. such as enc of python pr conditional s ions, built-i	and slicing apsulation, ogramming	Python. to access da polymorphi g such as dat	ata and dic ism, inheri a types, va		aries ir ce in Py ples, op	n Pytho /thon.	on s,
CO3		used in strir to access and			ing in Disti	onorios Dui	lt In Funa	tion	a diati	anania	a 1:a
005		s ,methods-c						tion	s -ulcu	onarie	5, 115
<b>CO4</b>		nt the use of						files	and cs	v files	.os
		th Modules,									
CO5		e the differe								educe	
Manning of		ent time bec				sulation, pol	ymorphisi	m et	c.		
Mapping of Cos/POs	PO1	PO2	Program PO3	PO4	POS)	PO6	D07		DOO		00
COS/POS	POI	PO2	PUS	PO4	P05	PU0	P07		PO8	P	09
CO1	3	2	3	3	2	2	3		2		2
CO2	3	3	3	1	2	3	1		2		3
CO3	3	1	2	2	3	3	2		3		3
CO4	3	3	3	2	1	3	2		1		3
CO5	3	3	2	3	2	3	3		2		3
Cos/PSOs	I	PS01	P	PS02	Р	S03			<b>PS04</b>		
CO1		3		3		2			2		
CO2		2		3		2			3		
CO3		3		2		1			3		
CO4		3		3		1			3		
CO5		2		3		3			3		
	3/2	2/1 Indicates	Strength (	Of Correlati	on, 3 – Hig	h, 2- Mediu	m, 1- Low	7			
Category		Program core	Program Elective	Open elective	Skill enhancing	Interdisciplin ary/Allied		P I	ractical Project/	oth	hers
		,			elective			In	ternship		
		V			elective			In	ternship		

## Inheritance, The Polymorphism

#### **TEXT BOOK**

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372

#### **REFERENCE BOOKS / WEBLINKS:**

- 1. Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", 1st Edition, O'Reilly Media, 2016. ISBN-13: 978-1491912058
- 2. AurelienGeron, Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems", 1st Edition, O'Reilly Media, 2017. ISBN - 13: 978-1491962299.

Parts of Python Programming Language: Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data Types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() Function and Is Operator, Dynamic and Strongly Typed Language. Control Flow Statements: The if statement, The if...else Statement, The if...else Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements, Catching Exceptions Using try and except Statement,

#### **UNIT II**

UNIT I

Subject

**CBCA22010** 

Code:

Functions: Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Lifetime of Variables, Default Parameters, Keyword Arguments, *args and **kwargs, Command Line Arguments. Strings: Creating and Storing Strings, Basic String Operations, Accessing Characters in String by Index Number, String Slicing and Joining, String Methods, Formatting Strings, Lists, Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement.

#### **UNIT III**

Dictionaries: Creating Dictionary, Accessing and Modifying key:value Pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary Methods, The del Statement, Tuples and Sets: Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Built-In Functions Used on Tuples, Relation between Tuples and Lists, Relation between Tuples and Dictionaries, Tuple Methods, Using zip() Function, Sets, Set Methods, Traversing of Sets, Frozenset.

#### **UNIT IV**

Files: Types of Files, Creating and Reading Text Data, File Methods to Read and Write Data, Reading and Writing Binary Files, The Pickle Module, Reading and Writing CSV Files, Python os and os.path Modules, Regular Expression Operations: Using Special Characters, Regular Expression Methods, Named Groups in Python Regular Expressions, Regular Expression with glob Module.

Constructor Method, Classes with Multiple Objects, Class Attributes versus Data Attributes, Encapsulation,

## UNIT V

12 Hrs

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12 Hrs

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# 12 Hrs

12 Hrs

# Object-Oriented Programming: Classes and Objects, Creating Classes in Python, Creating Objects in Python, The

12 Hrs

#### Total No of Hrs: 60



Subject Name: PROGRAMMING IN PYTHON

Prerequisite : Basic Knowledge in C and C++ Programming

# Br. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY UNIVERSITY UNIVERSITY An ISO 21001: 2018 Certified Institution) Perjar E.V.R. High Boad, Maduravoyal, Chennal-95. Tamilnadu, India.

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Subject Code		t Name: <b>OP</b>	ERATING	SYSTEMS			Ty/Lb/ ETP/IE		T / S.Lr	P/R	С
CBCA22011		uisite :F <b>ami</b> s of comput				oftware	Ту	3	0/0	0/0	
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COURSE O			maring or i	coources an	liong users	and program	15				
Students com		· · ·	e able to								
CO1				d basic arch	itectural co	omponents ir	nvolved in	OS d	lesign.		
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002	systems	the various	device une	i iesouree n	lunugemen	teeninques	for times s	, incluin	ing und	anstino	utet
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Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	09
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CO3	3	2	2	3	3	1	3		3		1
CO4	2	3	3	2	1	3	2		1		3
CO5	3	3	2	3	2	3	3		2		3
Cos/PSOs	-	PS01	F	PS02	P	S03		]	PS04		
CO1		3		3		2			2		
CO2		2		2		3			3		
CO3		3		3		1			2		
CO4		3		1		2			3		
CO5		2		3		3			3		
	3/2	2/1 Indicates	s Strength	Of Correlati	on, 3 – Hig	h, 2- Mediu	m, 1- Low				
Category		Program core	Program Elective	Open elective		Interdisciplin ary/Allied	Skill component	Pı P	ractical Project/ ternship	oth	hers
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		۲									

#### Subject Name: OPERATING SYSTEMS Tv/Lb/ L Τ/ P/R С **ETP/IE** Subject Code: S.Lr **CBCA22011** Prerequisite :Familiar with, basic hardware and software 3 Ty 0/00/0 3 aspects of computer systems organization.

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#### **OBJECTIVES:**

- Student will learn the functioning of modern computers  $\triangleright$
- $\geq$ Student will learn the purpose, structure and functions of operating systems
- Student will learn the illustration of key OS aspects by example ۶

### UNIT I

Introduction: What is an operating system? - Mainframe, desktop, multiprocessor, distributed, clustered, real - time and handheld systems - Operating System Structures - System components - operating system services - system calls - systems programs system structure - virtual machines.

#### UNIT II

Process: Process concept - process scheduling - operations on processes - cooperating processes - Inter process communication -CPU Scheduling: Basic concepts, scheduling criteria, scheduling algorithms. **09 Hrs** 

#### UNIT III

Process Synchronization: The critical section problem - semaphores - classical problems of synchronization - Deadlocks: Deadlock characterization, methods for handling deadlocks, Deadlock prevention, avoidance and detection, Recovery from deadlocks. **09 Hrs** 

#### UNIT IV

Memory Management: Swapping - contiguous memory allocation - paging - segmentation - segmentation with paging - Virtual Memory - Demand paging - page replacement - location of frames - thrashing.

#### UNIT V

Storage Management: Introduction- File Concept - File Attributes- File Operations - File Types - Access Methods: Sequential and Direct - Directory Structure: Storage Structure, Directory Overview

#### **TEXTBOOK :**

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne(2006), Operating System Principles(7th ed.), John Wiley & Sons(Asia) Pte Ltd.

#### **REFERENCES:**

1. Thomas Anderson & MichaelDahlin (2014), Operating Systems: Principles and Practice (2nd ed.)

2. H.M. Deitel(1990), An Introduction to Operating System, 2nd ed. Addison Wesley.

3. Andrew S. Tanenbaum , Modern Operating Systems (4th ed.)

4. Stallings, Operating systems(6thed)., Prentice Hall.

**09 Hrs** 

#### **Total No of Hrs: 45**



**09 Hrs** 

### **09** Hrs

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Subject	Subjec	t Name: W	EB PROGR	AMMING			T/L/	L	Τ/	P/R	C
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COURSE O	UTCOM	ES (Cos)									
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CO2	Demonst		ing website. ing text for b ocument and				ig Text fori	natti	ng tags.	Adding	g
CO3	HTML d columns.	locument, Fo	g to divide the form tag used t	to accept use	er Input and	Table tag use	d to arrang	e dat	a into ro	ow and	
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CO5	Roll over	r button.	pages using I			tively betwee	en the user	and	the web	page us	sing
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1.Thomas A. Powell(1999), HTML: The Complete Reference(2nd. ed.), Bpb Publication.

#### **REFERENCES:**

**TEXT BOOK:** 

1. Ed. Wilson (2006). *Microsoft VBScript: Step by Step*. Microsoft Press

2. Sterling Hughes(2001) PHP: Developers's Cook book, BPB publications

3. Ivan N Bayross(2000), Web Enabled Commercial Applications Development Using, HTML, DHTML, Java Script, Perl CGI(2nd ed.), BPB Publications

#### UNIT I

UNIT IV

UNIT V

Subject

**CBCA22017** 

Code:

UNIT III 12 Hrs Tables, Frame and Forms: Table tag and its Attributes - Frame: Overview of frame, Frameset - Simple frame, Frame

targeting - Forms: Form objects and Methods.

Style Sheets: Style Sheet Basics - Style Sheet Properties (Font Properties, Color and Background Properties, Text Properties, Box Properties)- Positioning with Style Sheets

DHTML: Introduction to Dynamic HTML and the Document Object Model-HTML and Scripting Access-Rollover Buttons-Moving Objects with DHTML-Ramifications of DHTML

Web Publishing: Web browser - WWW - Web design process: Implementation, Maintenance Phases of Website - Web Publishing - HTML Documents: Overview, rules guidelines, structure of HTML documents, document types.

O 21001 : 2018 Certified Inst Road, Maduravoval, Chennai-9

Prerequisite : Basics knowledge in Computer Fundamentals

HTML Tags: <HTML> - <HEAD> - <TITLE> , <BODY>,<Marquee> - Paragraphs - Lists - Text Formatting, <Font>, Text Styles - Adding Graphics to HTML Docuements - Linking Documents

## UNIT II 12 Hrs

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Subject Name: WEB PROGRAMMING

# Total No of Hrs: 60

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## 12 Hrs



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#### Prerequisite : Basic knowledge in Ty entrepreneurship development L: Lecture, T: Tutorial, SLr: Supervised Learning, P: Project, R: Research, C: Credits, T/L/ETL : Theory / Lab / Embedded Theory and Lab

ENTREPRENEURSHIP DEVELOPMENT

## **UNIT I: Concept of Entrepreneurship**

Subject

HBCC22002

Code:

Entrepreneurship - Meaning - Types - Qualities of an Entrepreneur - Classification of Entrepreneurs - Factors influencing Entrepreneurship - Functions of Entrepreneurs. 9 Periods

## **UNIT II: Entrepreneurial Development Agencies.**

Subject Name:

Commercial Banks - District Industries Centre - National Small Industries Corporation Small Industries Development Organisation - Small Industries Service Institute.All India Financial Institutions.SIPCOT and its objectives.MSME Sector and its coverage Objectives of Ministry of MSME.Role and Functions of MICRO Small and Medium Enterprises - Development Organisation (MSME - DO) -Objectives of SIDCO - Functions of Tamil Nadu SIDCO - IRBI and its Role. NABARD and its role in the Rural Development of India - Introduction to Micro Units Development Refinance Agency (MUDRA) **UNIT III: Project Management** 9 Periods

Business idea generation techniques - Identification of Business opportunities - Feasibility study -Marketing, Finance, Technology & Legal Formalities - Preparation of Project Report- Tools of Appraisal. 9 Periods

## **UNIT IV - Entrepreneurial Development Programmes**

Entrepreneurial Development Programmes (EDP) - Role, relevance and achievements - Roleof Government in organizing EDPs- Critical evaluation

## **UNIT V - Economic Development and Entrepreneurial growth**

Role of Entrepreneur in Economic growth - Strategic approaches in the changing Economicscenario for small scale Entrepreneurs - Networking, Niche play, Geographic Concentration, Franchising / Dealership -Development of Women Entrepreneurship. Self-help groups and empowerment of Women in India -Financing SHG and their role in Micro-financing. Financial inclusion and its penetration in India, Challenges and Government role in Financialinclusion-PradhanMantri Jan-DhanYojana - Six Pillars of Its Mission objectives

<b>Books for Study</b>	Books	for	Study
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1. Saravanavel, P. Entrepreneurial Development, Principles, Policies and Programmes, EssPee Kay Publishing House - 1997, Chennai.

2. Tulsian, P.C & Vishal Pandey, Business Organization and Management, PearsonEducation India, 2002, Delhi.

## **Books for Reference :**

1. Janakiram, B, and Rizwana, M, Entrepreneurship Development, Text and Cases, ExcelBooks India, 2011, Delhi.

2. Arun Mittal & Gupta, S.L - Entrepreneurship Development, International Book HousePvt. Ltd, 2011, Mumbai.

3. Anil Kumar, S, Poornima, S, Abraham, K, Jayashree, K - Entrepreneurship Development, Newage International (P) Ltd, 2012, Delhi

4. Gupta C B and Srinivasan NP, Entrepreneurial Development, Sul

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# 9 Periods

## **Total Hours :** 45

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OBJECTIVE	S										
• Interpre	et the use of	procedural	statements	s like assign	ments, con	ditional state	ements, lo	ops	and fur	oction	calls
in Pyth	on Programm	ning.		_				_			
• Infer th	e supported	data structu	res like lis	sts, dictiona	ries and tup	oles in Pytho	on Program	nmi	ng.		
• Illustra	te the application	ation of ma	trices in bu	uilding the l	Python prog	grams.	-		_		
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COURSE OU	TCOMES	(Cos)									
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Subject Code: CBCA22L05	Subject Name: PROGRAMMING IN PYTHON         LABORATORY         Prerequisite : Basics of C++, JAVA Programming.	Ty/Lb/ ETP/IE Lb	L 0	T / S.L r 0	P/R 4	C 2
	Tutorial SLr : Supervised Learning P: Project R : Research C : Createry / Lab / Embedded Theory and Lab	lits				

- 1. Compute the GCD of numbers
- 2. Exponentiation (power of a number)
- 3. Find the maximum of a list of numbers
- 4. Linear search
- 5. Selection sort
- 6. Find N Prime Numbers
- 7. Multiply matrices
- 8. Find the most frequent words in a text read from a file
- 9. Simulate elliptical orbits in Pygame
- 10. Simulate bouncing ball in Pygame

Total no. of Hrs needed to complete the Lab: 60



Subject Code:	Subject	Name: WE	CB PROGRA	MMING L	ABORATO	RY	T/L/ ETL	L	T/ S.Lr	P/R	C
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Subject	Subject Name: WEB PROGRAMMING LABORATORY	T/L/	L	Τ/	P/R	С
Code:		ETL		S.Lr		
CBCA22L0	Prerequisite : Basic knowledge in Computer Programming	L	0	0/0	4/0	2
9						

- 1. Program to illustrate Text Formatting tags
- 2. Create a web page using ordered list and unordered list
- 3. A program to illustrate Hyperlink tag(Anchor tag)
- 4. Create a webpage which contains table with its Attributes
- 5. Create a Web Page using frame tag with its attributes
- 6. Create a webpage using img tag.
- 7. Create a web page using form tag
- 8. Use Cascading Style Sheet to create web page Use Internal style sheet
- 9. Create a web page using External Style Sheet Properties (Font, Color, Background, Text, and Box)
- 10. Program to illustrate roll over button

#### Total No of Hrs needed to complete the Lab: 60

#### **Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE** <u>DEMED TO BE UNIVERSITU</u> UNIVERSITY UNIVERSITU (A ISO 21001: 2018 Cortified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennal-95, Tamilnadu, India.

Subject Code: CBCA22012	Subject Na DESIGN	Ty/Lb/ ETP/IE Ty	r	L	P/R	C					
	Prerequisi	equisite : Programming fundamentals with C++						3 1		0	4
L : Lecture T : ' T/L/ETL : Theo					ct R : Resea	arch C : Cree	dits				1
OBJECTIVES	5										
Develo     develo	op a working op an apprec opment- op the skills t.	iation for a	and unders	tanding of	the risks inl	nerent to lar	ge-scale so	oftware	o a gi	iven	
COURSE OU	<b>TCOMES</b> (	Cos)									
Students compl			able to								
CO1				ts of object	oriented sy	stem develo	opment.				
CO2	To understa	and the me	thodology	and UML.	-		-				
CO3			0,		d analysis i	identifying u	ise case.				
CO4	To understa		<u> </u>	0							
CO5	To understa		<u> </u>	0	Ų	ce.					
Mapping of Co	ourse Outco	me with	Program (	Jutcome (I	POs)						
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO	8	P	)9
CO1	3	2	3	3	2	2	3	2		2	2
CO2	2	2	3	2	3	3	2	3			3
CO3	3	2	2	1	3	3	1	3			3
CO4	3	3	3	2	1	3	2	1			3
CO5	2	3	2	3	3	3	3	3		2	3
Cos/PSOs	PS	01	P	S02	Р	S03		PS	04		
C01	3	3		3		2		2	2		
CO2	2	2		2		1		3	;		
CO3	3			3		3			2		
CO4	3	3		3		2		3			
CO5		3		2		2		3			
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Subject	Subject Name: OBJECT ORIENTED MODELING AND	Ty/Lb/		Τ/	P/R	C					
Code:	DESIGN	ETP/IE	L	S.L							
CBCA22012				r							
	Prerequisite : Programming fundamentals with C++	Ту	3	1	0	4					
L : Lecture T : '	Tutorial SLr : Supervised Learning P: Project R : Research C : Crec	lits		•	•						
T/L/ETL : Theo	T/L/ETL : Theory / Lab / Embedded Theory and Lab										

#### **OBJECTIVES:**

- $\geq$ Develop a working understanding of formal object-oriented analysis and design processes.
- ≻ Develop an application and understanding of the risks inherent to large-scale software development.
- ⊳ Develop the skills to determine which processes and OOAD techniques should be applied to a given project.

#### UNIT I

Introduction OOSD Methodology - Unified approach - Object basics - Object state and properties - Behavior - Methods -Messages - Information hiding - Class hierarchy - Relationships - Associations - Aggregations- Identity - Dynamic binding -Persistence – Meta classes – Object oriented system development life cycle – S/W device process- High quality Software Object Oriented System Development- Reusability.

#### UNIT II

Methodology and UML Introduction - Survey - Rumbugh- Booch- Jacobson methods - Patterns - Frameworks - Unified approach - Unified modeling language - Static and Dynamic models - UML diagrams - Class diagram - Use case diagrams -Dynamic modeling diagrams - Interaction Diagrams- sequence diagrams.

#### UNIT III

Object Oriented Analysis Identifying Usecase - Business object analysis - Usecase driven object oriented analysis - Usecase model - Documentation - Introduction- classification theory- Approaches for Identifying classes - Identifying objectrelationships- attributes- methods - Super-sub class - Aggregation Class Responsibility - Object responsibility.

#### UNIT IV

Object Oriented Design -Design process - Axioms - Corollaries - Designing classes - Class visibility - Refining attributes -Methods and protocols - Object storage and object interoperability - DBMS - Object relational systems - Designing interface objects – Macro and Micro level processes – The purpose of a view layer interface

#### UNIT V

Software Quality assurance - Testing strategies - Object orientation testing - Test cases - Test Plan - Debugging principles -Usability - Satisfaction - Usability testing - Satisfaction testing.

#### Total no. of Hrs: 60

#### **REFERENCES:**

- 1. Ali Bahrami(2003), Object Oriented System Development, McGraw Hill International Edition.
- Craig Larman(2002) Applying UML and Patterns(2nd ed.) Pearson. 2.
- James Rumbaugh(2004) Object Oriented Modeling Language (2nd ed.), PHI. 3.

# **12 Hrs**

#### 12 Hrs

#### 12 Hrs

12 Hrs

12 Hrs



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Subject ( HBCC22		Sub	ject Name	UNIVER VALUES	SAL H	HUMA	-	7 <b>/Lb/</b> CTL	L	T/ SLr	P/R	C
			Prere	equisite : 1	None		F	ЕТР	2	0	2	3
L : Lecture	T : Tut	orial S	Lr : Supervi	sed Learni	ng P :	Project	t R:Res	search	C: Cred	its		
T/L/ETL : T	heory	/ Lab /	Embedded	Theory an	d Lab	-						
OBJECTIVE	-											
			ng, purpose							tional life		
			importance of great ar									and
			tualization.		iui pec				a practi		ii values	unu
			practice pr		l ethic	s with t	the goal	for the	univer	sal wellne	SS	
COURSE O	UTCON	/IES (Co	os) :									
Students c	omplet	ting the	e course we	re able to								
CO1	Becor	ne con	scious prac	titioners o	f value	es						
CO2	Realiz world		potential a	s human k	peings	and co	nduct t	hemsel	ves pro	perly in th	ie ways c	of the
CO3	Devel	op inte	gral life ski	ls with va	ues							
CO4	Inculo	ate and	d practice t	hem conso	ciously	to be	good hu	ıman be	eings.			
CO5	Practi	ce prof	essional et	hics with t	he goa	al for th	ne unive	ersal we	llness			
Mapping c	of Cour	se Outo	comes with	Program (	Dutcor	nes (P0	Ds)					
COs/PO	S	PO1	PO2	PO3	PC	)4	PO5	PO6	PC	07 PC	<b>3</b> 8	PO9
CO1		3	2	3	3	;	2	2	3	2	2	2
CO2		2	2	3	2		3	3	2		3	3
CO3		3	2	2	1		3	3		3	3	3
CO4		3	3	3	2	,	1	3	2	. 1		3
CO5		2	3	2	3		3	3	3	3	3	3
Category	H&S		ogra Progr core Elect		ive e	Skill nhancin g elective	Interdia nary/A	llied	Skill compo nent	Practical Intern		others
												7
COs/PSOs	125	01	PSO2	PSO3		PSO4		PSO5		PSO6	PSO	/
CO1		3	3	2			2		3	3		2
CO2		2	2	1			3	,	2	2		1
CO3		3	3	3			2		3	3		3
CO4		3	3	2			3		3	3		2
CO5		3	2	2			3		3	2		2
		3	3	2			2		3	3		2

#### L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab Unit 1 Love and Compassion: 9 Hrs

Love and its forms: love for self, parents, family, friend, spouse, community, nation, humanity, nature and other beings—living and non-living. Love and compassion and inter-relatedness. Individuals who are remembered in history for love and compassion and what will learners gain if they practice love and compassion

Related activities: Sharing learner's individual and/or group experience(s), community outreach program to manifest love and compassion toward people and nature, Simulated Situations, Case studies UNIT 2: 9 Hrs

Truth and Righteousness: Universal truth, truth as value (artha), truth as fact (satya), veracity, sincerity, honesty among others. Understanding righteousness, Righteousness and dharma, righteousness and propriety, Individuals who are remembered in history for practicing truth and righteousness and what will learners gain if they practice Truth and Righteousness

Sharing learner's individual and/or group experience(s), exercises on ease with truth can be recalled consistently, Simulated Situations. Case studies 9 Hrs

Unit 3:

Non-Violence and Peace; pre-requisites for non-violence- Love, compassion, empathy, and sympathy, Ahimsa as nonviolence and non-killing, the impact of practicing non-violence-Peace, harmony and balance, Individuals and organizations that are known for their commitment to non-violence and peace, and what will learners gain if they practice non-violence and work towards peace

Sharing learner's individual and/or group experience(s), Simulated Situations, Case studies Unit 4:

Renunciation (Sacrifice) Tyaga: Renunciation and sacrifice, developing a balance between enjoyment and sacrifice, Bhoga(enjoyment) with tyagabhava and tyaga (Sacrifice) with bhogabhava is the root of all human and literary values, enjoying life and freedom with responsibility and What will learners learn/gain if they practice renunciation and sacrifice

Social outreach programs for sharing and caring experience, expressing gratitude, Sharing learner's individual and/or group experience(s), Simulated Situations, Case studies Unit 5: 9 Hrs

Professional Ethics: Understanding Acceptance of human values and Ethical Human Conduct, Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order, Developing Competence in professional ethics and practicing it, to utilize the professional competence for augmenting universal human order and create people friendly eco-friendly identify the scope and characteristics of people friendly and eco-friendly systems for the wellness of the universe as a whole. Exercises to propagate people friendly eco-friendly activities both creative and functional, Brain storming, Sharing learner's individual and/or group experience(s), Simulated Situations, Case studies

## **References and Suggested Readings:**

Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi. 2010

The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi

Basham, A.L. 1954. The Wonder That Was India. London: Picador Press.

Basu, D.D. 2015. Workbook on the Constitution of India, Paperback Edition. Nagpur: Lexisnexis.

Ghosh, Sri Aurobindo. 1998. The Foundations of Indian Culture. Pondicherry: Sri Aurobindo Ashram.

Joshi, Kireet. 1997. Education for Character Development. Delhi: Dharam Hinduja Centre of Indic Studies.

Milton, Rokeach. 1973. The Nature of Human Values. New York: The Free Press.

Mookerji, Radha K. 1989. Ancient Indian Education. Delhi: Motilal Banarasidass

Saraswati, Swami Satyananda .2008. Asana Pranayama Mudra Bandha. Munger, India: Bihar School of Yoga.

#### STITUTE AND RESE DEEMED TO BE UNIVE (An ISO 21001 : 2018 Certif Periyar E.V.R. High Road, Maduravoval, Ch adu. India **Subject Code :** Subject Name UNIVERSAL HUMAN **T**/ P/R Tv/Lb/ L HBCC22ET1 VALUES SLr ETL **Prerequisite : None** ETP 2 0 2

9 Hrs

С

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Total no. of Hrs:45



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Subject	Subject I	Name: <b>PRC</b>	<b>JECT WO</b>	ORK			Ty/Lb/E	L T /	P/R	С
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	Applicat	tions and it	s Concepts	5						
L : Lecture T					ect R : Rese	earch C : Cr	edits			
T/L/ETL : Th	•	Embedded	Theory an	d Lab						
OBJECTIV	ES									
• To inv	estigate the	ability on i	deas and tr	ansformation	ons.					
• To im	plement the	technologie	es or its cor	nbinations.						
• To ana	alyze on mo	deling the c	concepts to	bring it to	real time.					
• To cre	ate a databa	ise models t	hat is going	g to be the	store house	of informat	tion.			
	velop an exe		-							
• To pre	pare projec	t report that	is going to	be the refe	erral docum	ent for the	complete p	roject.		
COURSE O							<b>.</b>	v		
Students com	pleting this	course wer	e able to							
CO1	Understan	d the conce	pts , use th	em in ideas	s and transf	orm it to ap	plications.			
CO2	Implemen	t the techn	ology to br	ing a new p	product.					
CO3	Apply dif	ferent algor	ithms and c	lerive codi	ng modules	for executi	on.			
CO4						o product d				
CO5	Illustrate t	the complet	ed project a	as documen	t that stand	s as the sou	rce of refer	rence.		
Mapping of	Course Ou	tcome with	Program	Outcome (	(POs)					
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	09
CO1	3	2	2	2	3	2	2	3	2	2
CO2	3	3	3	1	2	3	1	2		3
CO3	3	2	3	3	1	3	3	1	3	3
CO4	3	3	3	1	2	3	1	2	3	3
CO5	3	3	2	2	3	3	2	3		3
Cos/PSOs	Р	S01	Р	S02	P	S03		<b>PS04</b>		
CO1		3		3		3		3		
CO2		3		3		2		2		
CO3		2		3		1		3		
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Subject Code:	Subject Name: PROJECT WORK	Ty/Lb/E TP/IE	L	T / S.Lr	P/R	С
CBCA22L06	Prerequisite : : Basic knowledge in Programming ,Computer Applications and its Concepts	Lb	0	0	18	9
	Tutorial SLr : Supervised Learning P: Project R : Research C : Cr ory / Lab / Embedded Theory and Lab	redits				

# Students will be able to develop an application in specific domains. Students are expected to carry out the following:

- i. Implementing the technologies or its combinations
- ii. Analysing and modeling the concepts of system engineering
- iii. Generate Database Models
- iv. Develop an executable application
- v. Prepare project report



Subject Code: CBCA22E01	Subject Na		Ty/Lb/E TP/IE	L T/ S.L r	P/R	C				
	Prerequisit SQL, NoS				ysis tools, e	specially	Ту	3 0	0	3
L : Lecture T					ect R · Rese	arch C · Cr	edits			
T/L/ETL : The							carts			
OBJECTIVE	•									
• Be fam	iliar with ma	thematical	foundatio	ons of data	mining tool	8.				
• To Une	derstand and	implement	classical	models and	l algorithms	in data wa	rehouses a	nd data m	ining.	
	aracterize the	kinds of p	atterns that	t can be di	scovered by	association	n rule mini	ng, classi	fication	and
cluster			_							
• To Dev	velop skill in	selecting t	he approp	riate data n	nining algor	ithm for so	lving pract	ical probl	ems.	
COURSE OU	JTCOMES (	(Cos)								
Students com										
CO1	Understand		-		-					
CO2	Appreciate t	the strengt	hs and lim	itations of	various data	i mining an	d data ware	ehousing	models	•
CO3	Explain the	analyzing	techniques	s of various	s data					
CO4	Describe dif	fferent met	hodologie	s used in d	ata mining a	and data wa	re housing	•		
CO5	Compare dif	fferent app	roaches of	f data ware	housing an	d data mini	ng with va	rious tech	nologie	es.
Mapping of (	-				-		C		<u> </u>	
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	09
	2	2	3	3	2	2	3	2		2
CO1	3	2								
CO1 CO2	3	3	3	1	2	3	1	2		3
			3 2	1			1	23		3 3
CO2	3	3			2	3				
CO2 CO3	3 3	3 2	2	1	2 3	3 3	1	3		3
CO2 CO3 CO4	3 3 3	3 2 3 3	2 3 2	1 2	2 3 1 2	3 3 3	1 2	3		3 3
CO2 CO3 CO4 CO5	3 3 3 3 3	3 2 3 3 01	2 3 2	1 2 3	2 3 1 2 PS	3 3 3 3	1 2	3 1 2		3 3
CO2 CO3 CO4 CO5 Cos/PSOs	3 3 3 3 PSC	3 2 3 3 01	2 3 2	1 2 3 802	2 3 1 2 PS	3 3 3 3 503	1 2	3 1 2 <b>PS04</b>		3 3
CO2 CO3 CO4 CO5 Cos/PSOs CO1	3 3 3 3 PSO 3	3 2 3 3 01	2 3 2	1 2 3 <b>S02</b> 3	2 3 1 2 PS	3 3 3 3 603 2	1 2	3 1 2 <b>PS04</b> 2		3 3
CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2	3 3 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	3 2 3 3 01	2 3 2	1 2 3 <b>S02</b> 3 2	2 3 1 2 PS	3 3 3 3 503 2 1	1 2	3 1 2 <b>PS04</b> 2 3		3 3
CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 3 3 <b>PS</b> 3 3 2 3 3 3 2 2	3 2 3 3 01	2 3 2 P	1 2 3 <b>S02</b> 3 2 3 3 3 3 3	2 3 1 2 PS	3 3 3 503 2 1 1 2 3	1 2 3	3 1 2 <b>PS04</b> 2 3 3 3 3 3 3		3 3
CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO4 CO5	3 3 3 3 PSO 3 2 3 3 2 3/2/1	3 2 3 3 01	2 3 2 P	1 2 3 <b>S02</b> 3 2 3 3 3 0f Correlati	2 3 1 2 PS	3 3 3 503 2 1 1 2 3 h, 2- Mediu	1 2 3	3 1 2 <b>PS04</b> 2 3 3 3 3 3 3		3 3
CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 3 3 3 PSO 3 2 3 3 2 3/2/1	3 2 3 3 01	2 3 2 P	1 2 3 <b>S02</b> 3 2 3 3 3 3 3	2 3 1 2 PS	3 3 3 503 2 1 1 2 3	1 2 3	3 1 2 <b>PS04</b> 2 3 3 3 3 3 3		3 3

## **Total:45 Hrs**

## 9 Hrs

## 9 Hrs

9 Hrs

Tv/Lb/E

TP/IE

Т/

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С

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## 9 Hrs

# 9 Hrs

# UNIT – III **Cluster analysis**: cluster analysis – types of data – computing distances-types of cluster analysis methods - partitioned

methods - hierarchical methods - density based methods - dealing with large databases - quality and validity of cluster analysis methods - cluster analysis software.

Web data mining: Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining - web mining software - Search engines: Search engines functionality- search engines architecture - ranking of web pages.

UNIT - V

Guidelines for data warehousing implementation - Data warehousing metadata - Online analytical processing (OLAP): Introduction - OLAP characteristics of OLAP system - Multidimensional view and data cube - Data cube implementation - Data cube operations OLAP implementation guidelines

Data warehousing: Introduction - Operational data sources- data warehousing - Data warehousing design -

**BOOK FOR STUDY:** —Introduction to Data mining with case studies, G.K. Gupta, PHI Private limited, New Delhi, 2008. 2nd Edition, PHI, 2011

## **BOOK FOR REFERENCE**

Data Mining Techniques, Arun K Pujari, University Press



### Prerequisite : Familiarity with data analysis tools, especially 3 Ty SQL, NoSQL, SAS, and Hadoop. L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

Subject Name: Data Mining and Ware Housing

## UNIT – I

Subject

CBCA22E01

Code:

**Introduction:** Data mining application – data mining techniques – data mining case studies- the future of data mining - data mining software - Association rules mining: Introduction- basics- task and a naïve algorithm- apriori algorithm - improve the efficient of the apriori algorithm - mining frequent pattern without candidate generation (FPgrowth) – performance evaluation of algorithms.

predictive accuracy of classification methods - other evaluation criteria for classification method - classification

UNIT – II Classification : Introduction – decision tree – over fitting and pruning - DT rules-- naïve bayes method- estimation

software

## UNIT – IV



Subject Code: CBCA22E02	Subject N	ame: INF(	ORMATI(	ON SECUI	RITY		Ty/Lb/E TP/IE	L	T / S.L r	P/R	C
	Prerequisi	te : : Conc	cept of Int	formation	handling		Ту	3	0	0	3
L : Lecture T :		<b>.</b>		<b>U U</b>	ct R : Resea	arch C : Cre	dits				
T/L/ETL : The	ory / Lab / E	mbedded 7	Theory and	l Lab							
OBJECTIVE	S										
To intro	oduce the cor	ncepts of In	nformation	Security, a	and its Char	acteristics.					
• To imp	art the basic	concepts o	f Security	Investigatio	on and its E	thical and F	rofessiona	l Issu	ues.		
• To fam	iliarize the co	oncepts of	Security A	nalysis and	l Risk Mana	agement.					
To prov	vide knowled	ge about I	nformatior	Security P	olicy Stand	ards and N	IST framew	vork			
	erstand the P		sign and cr	yptography	and its tecl	hnology.					
COURSE OU											
Students comp											
CO1					on Security						
CO2	Applying the	ne concept	s of securi	ty investiga	tion in Busi	iness needs,	, Legal and	prot	fessior	al ethi	ics.
CO3	Expose the	ongoing p	rocess of i	dentifying	security risk	ks and imple	ementing p	lans	to add	ress th	nem.
CO4	Policy stan	dards esta	blish guide	elines and g	d BS 7799 ( general princ Industrial a	ciples for m	aintaining	and	improv	ving	
CO5		ulnerabilit	y exploits	against a ta	arget Compu	uter by Intru	usion Detec	ction	Syster	m.	
Mapping of C	Course Outco	ome with l	Program (	Outcome (I	POs)				-		
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	]	PO8	P	09
CO1	3	2	3	3	2	2	3		2		2
CO2	3	3	3	2	1	3	2		1		3
CO3	3	2	2	1	3	3	1		3		3
CO4	3	3	3	2	1	3	2		1		3
CO5	3	3	2	3	2	3	3		2	Í	3
Cos/PSOs	PS	501	P	S02	P	<b>S03</b>		1	PS04		
C01		3		3		2			2		
CO2	, , , , , , , , , , , , , , , , , , ,	2		2		1			3		
CO3		3		2		1			3		
CO4		ר ר		3		2			3		
	-	5		5		3			5		
CO5		3 2		3		3 3			3		
CO5		2	Strength C	3	on, 3 – Higl	3	m, 1- Low				
	3/2/1	2	Strength C Program Elective	3	on, 3 – Higl Skill enhancing elective	3		Pı		oth	ners

1. 1. Michael E Whitman and Herbert J Mattord(2003), "Principles of Information Security", Vikas Publishing House, New Delhi.

## **REFERENCES:**

- 1. Micki Krause, Harold F. Tipton(2004), "Handbook of Information Security Management", Vol 1-3 CRC Press LLC.
- 2. Stuart Mc Clure, Joel Scrambray, George Kurtz(2003), "Hacking Exposed", Tata McGraw-Hill.
- 3. Matt Bishop(2002), "Computer Security Art and Science", Pearson/PHI.

## UNIT I

Introduction: History, What is Information Security? Critical Characteristics of Information - NSTISSC Security Model - Components of an Information System - Securing the Components - Balancing Security and Access - The SDLC - The Security SDLC

Security Investigation: Need for Security - Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

## **UNIT III**

**UNIT II** 

Security Analysis : Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

### UNIT IV

## Logical Design: Blueprint for Security - Information Security Poicy - Standards and Practices - ISO 17799/BS 7799 -NIST Models - VISA International Security Model - Design of Security Architecture - Planning for Continuity

## UNIT V

Physical Design : Security Technology – IDS - Scanning and Analysis Tools – Cryptography - Access Control Devices - Physical Security - Security and Personnel

## Total No of Hrs: 45

## 9 Hrs

## 9 Hrs

9 Hrs

9 Hrs

Subject Code: CBCA22E02	Subject Name: INFORMATION SECURITY	Ty/Lb/E TP/IE	L	T/ S.L r	P/R	C
	Prerequisite : : Concept of Information handling	Ту	3	0	0	3
	Tutorial SLr : Supervised Learning P: Project R : Research C : Cre ry / Lab / Embedded Theory and Lab	dits				

# Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE DEEMED TO BE UNIVERSITY UNIVERSITY WITH GRACKER AUTONOMY STATUS (AN ISO 21001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennai-95, Tamilandu, India.

Code:	Subject Na	ime: <b>PRO</b> I	FESSION	AL ETHI	CS		Ty/Lb/E TP/IE	L	T / S.Lr	P/R	C
CBCA22E03	Prerequisit Communi		ince in Co	mmercial	awareness	and	Ту	3	0	0	3
L : Lecture T	: Tutorial SL	r : Supervi	sed Learni	ng P: Proje	ect R : Rese	arch C : 0	Credits T/L	/ETI	L:Theor	y / La	b
OBJECTIVE	S										
• It is the	e field of syst	em in mor	al principle	es that app	lies in pract	ice of eng	gineering.				
	e process whi	•	•	•			·			the ou	ıtloo
	To enhance e										
	elop ethical y										
	nternational b		involves ei	mployment	t practice, h	uman rig	hts and mo	ral o	bligation	1	
COURSE OU			11 /								
Students comp CO1	<u> </u>			- athias is t	o idontify a	nacific of	highligger		hnicolic		<u></u>
cor	Learn the pu help engined about right a	ers to learn									
CO2	Process of d		a product.	an engine	er generallv	learns th	rough expe	erime	entation.	To sir	nply
	put, a trial a	1 0	•	U	<i>u</i> .		0 1				гJ
CO3	Meet the org	ganizationa	al goals, sa	fety the pr	ofessionals	should p	ossess resp	ect f	or author	rity. Tl	he
	levels of aut	•	•	•			eans for ide	entify	ing area	s of	
004	personal res										
CO4	Understand disloyalty. 7	•	•			•	• •	y cit	e acts th	at cons	stitu
				costonais t	Owarus an C	ngamzau	IOII.				
CO5	Know Conf							as c	ost, time	, logis	tics
	required to a	licts that of make it in a	ccur over t a possible	echnical, e way of coc	conomic, a ling in inter	nd time fa	actors such			, logis	tics
Mapping of (	required to r Course Outco	licts that of make it in a ome with	ccur over t a possible <b>Program</b>	echnical, e way of coc Outcome (	conomic, a ling in inter <b>POs</b> )	nd time fa national o	actors such commercia		rket.	-	
Mapping of (	required to a	licts that of make it in a	ccur over t a possible	echnical, e way of coc	conomic, a ling in inter	nd time fa	actors such			-	tics 09
Mapping of (	required to r Course Outco	licts that of make it in a ome with	ccur over t a possible <b>Program</b>	echnical, e way of coc Outcome (	conomic, a ling in inter <b>POs</b> )	nd time fa national o	actors such commercia		rket.	P	
Mapping of C Cos/POs	required to r Course Outco PO1	licts that of make it in a ome with PO2	ccur over t a possible Program ( PO3	echnical, e way of coc Outcome ( PO4	conomic, and ling in inter POs) PO5	nd time fanational of <b>PO6</b>	actors such commercia <b>P07</b>		rket. <b>PO8</b>	P	09
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Mapping of C Cos/POs CO1 CO2	required to r Course Outco PO1 3 2	licts that or make it in a ome with 1 PO2 2 3	ccur over t a possible Program PO3 3 3	echnical, e way of coc Outcome ( PO4 3 1	conomic, an ling in inter POs) PO5 2 2	PO6 2 3	actors such commercia P07 3 1		rket.           PO8           2           2           2	P(	<b>09</b> 2 3
Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5	required to 1Course OutcoPO1323333	icts that or make it in a ome with PO2 2 3 2 3 3 3	ccur over t a possible Program PO3 3 3 2	echnical, e way of coc Outcome ( PO4 3 1 3	conomic, an ling in inter POs) PO5 2 2 2 3	PO6 2 3 1	ectors such commercia P07 3 1 3		PO8           2           2           3           1           2		09 2 3
Mapping of C Cos/POs CO1 CO2 CO3 CO4	required to 1Course OutcoPO132333	icts that or make it in a ome with PO2 2 3 2 3 3 3	Ccur over t a possible Program 3 3 2 3 2 2 3	echnical, e way of coc Outcome ( PO4 3 1 3 2	conomic, an ling in inter POs) PO5 2 2 3 1	PO6 2 3 1 3 3 3	P07 3 1 3 2		PO8           2           2           3           1		09 2 3 1 3
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Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1	required to r Course Outco PO1 3 2 3 3 3 3 PS0 3	licts that or make it in a ome with PO2 2 3 2 3 2 3 01	Ccur over t a possible Program 3 3 2 3 2 PS	echnical, e way of coo <b>Dutcome (</b> <b>PO4</b> 3 1 3 2 3 <b>S02</b> 3	conomic, an ling in inter POs) PO5 2 2 2 3 1 2 PS0 2 PS0 2	nd time fa         national of         2         3         1         3         3         3         3	P07 3 1 3 2		rket. PO8 2 2 3 1 2 PS04 2		09 2 3 1 3
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Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO3 CO4	required to 1       Course Outco       PO1       3       2       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3	licts that or make it in a ome with PO2 2 3 2 3 3 01	Ccur over t a possible Program ( PO3 3 3 2 3 2 PS	echnical, e way of coo <b>Dutcome (</b> <b>PO4</b> 3 1 3 2 3 <b>S02</b> 3 3 3 3	conomic, an ling in inter POs) 2 2 2 3 1 2 PSG 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 3 1 2 2 2 3 1 2 2 2 3 1 2 2 2 3 1 2 2 2 3 1 2 2 2 2	nd time fa         national of         2         3         1         3         3	P07 3 1 3 2 3 1 2 3		rket. PO8 2 2 3 1 2 PS04 2 1 3 3		09 2 3 1 3
Mapping of C Cos/POs CO1 CO2 CO3 CO4 CO5 CO5/PSOs CO1 CO2 CO3 CO3 CO4 CO4 CO5	required to n       Course Outco       PO1       3       2       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3       3	licts that or make it in a ome with PO2 2 3 2 3 3 01	Ccur over t a possible Program ( PO3 3 3 2 3 2 PS	echnical, e way of coo <b>Dutcome (</b> <b>PO4</b> 3 1 3 2 3 <b>S02</b> 3 3 3 3	conomic, an ling in inter POs) PO5 2 2 2 3 1 2 PS6 2 2 3 1 2 2 3 1 2 2 3 3 1 2 2 3 3 0n, 3 – Hig Skill	PO6 2 3 1 3 3 3 03 h, 2- Mec	P07 3 1 3 2 3 1 2 3	2 mar	rket. PO8 2 2 3 1 2 PS04 2 1 3 3		09 2 3 1 3

# Total No of Hrs: 45

# 9 Hrs

9 Hrs

С

3

## 9 Hrs

9 Hrs

## 9 Hrs

## **UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION:** Engineering as experimentation – engineers as responsible

# **UNIT III**

ENGINEER'S RESPONSIBILITY FOR SAFETY: Safety and risk – assessment of safety and risk – risk benefit analysis - reducing risk - the three mile island and chernobyl case studies.

experimenters – codes of ethics – a balanced outlook on law – the challenger case study.

**UNIT IV RESPONSIBILITIES AND RIGHTS** : Collegiality and loyalty – respect for authority – collective bargaining – confidentiality – conflicts of interest – occupational crime – professional rights – employee rights – intellectual property rights (ipr) – discrimination

GLOBAL ISSUES : Multinational corporations – environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – sample code of conduct

## **TEXT BOOK:**

UNIT V

1. Mike Martin and Roland SchinzingeR(1996), "*Ethics in Engineering*", McGraw Hill, New York.

## **REFERENCES:**

- 1. Charles D Fleddermann(1999), "Engineering Ethics", prentice Hall, New Mexico.
- 2. Laura Schlesinger(1996), "How Could You Do That: The Abdication of Character, Courage, and Conscience", Harper Collins, New York.
- 3. Stephen Carter(1996), "Integrity", Basic Books, New York.
- 4. Tom Rusk(1993), "The Power of Ethical Persuasion: From Conflict to Partnership at Work and in Private Life", Viking, New York.

### du. India Subject Subject Name: PROFESSIONAL ETHICS Ty/Lb/E Τ/ P/R L TP/IE Code: S.Lr **CBCA22E03** Prerequisite : : A Glance in Commercial awareness and Tv 3 0 0 Communication L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL: Theory / Lab

## UNIT I

**ENGINEERING ETHICS**: Senses of 'engineering ethics' – variety of moral issues – types of inquiry – moral dilemmas - moral autonomy - kohlberg's theory - gilligan's theory - consensus and controversy - professions and professionalism – professional ideals and virtues – theories about right action – self-interest – customs and religion – uses of ethical theories.



Prerequisi					EMENT	Ty/Lb/ ETP/IE	T / L S.Lr	P/R	С
	te : Basic l	knowledge	e in Softwa	re Enginee	ering.	Ту	3 0	0	3
Futorial SL1 ry / Lab / E				ct R : Resea	urch C : Creo	dits			
rovide proj oach. Learn about agement an	ect plannin the Project d to study ]	g and sche Managen Resource a	eduling pro	ject monito edge to dise	ring and selected states the not	ion of risks	and the ri	sk	t
									n of
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**UNIT III** 

UNIT V

1. Mike Cotterell, Bob Hughes, "Software Project Management", Inclination/Thomas Computer Press, 4th Edition, 2004. Chapters : 1-13

## **REFERENCES:**

1. Darrel Ince, H.Sharp and M.Woodman," Introduction to Software Project Management and Quality Assurance", Tata McGraw Hill, 1995.

Philip.B.Crosby, Quality is Free: The Art of Making Quality Certain, Mass Market, 1992.

Software quality assurance plan & Risk Management : Resource Allocation - Monitoring and Control, Reviews

Models : ISO 9000 model, CMM model - Comparisons - ISO 9000 weaknesses - Managing People and Organizing Teams - Software Quality -Planning for Small Projects.

**UNIT IV** 9 Hrs

and Audits - Management.

Case Study - PRINCE Project Management, BS 6079:1996

Introduction to Software Projects : An Overview of Project Planning – Project Management and Evaluation .

**UNIT II** 9 Hrs

Selection of an appropriate Project approach : Software effort Estimation -Activity Planning :- Project Schedules -Sequencing and Scheduling Projects - Network Planning Model - forward and backward pass-Identifying the Critical path-Activity float-Shortening Project Duration - Identifying Critical Activities-precedence networks.

### Subject Name: SOFTWARE PROJECT MANAGEMENT P/R С Subject Ty/Lb/ Τ/ Code: ETP/IE L S.Lr CBCA22E04 Prerequisite : Basic knowledge in Software Engineering. 3 0 0 3 Ty L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab UNIT I

9 Hrs

9 Hrs

Total No of Hrs: 45





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Subject

CBCA22E05

Code:

UNIT I

UNIT II

UNIT III

UNIT IV

UNIT V

1. W. S. Jawadekar(2002), Management Information System, Tata McGraw Hill.

organization to operate the system - document the detailed design - revisit the manager user

REFERENCES:

- 1. Robert G. Murdick, Loel E. Ross & James R. Claggett, Information System for Modern Management (3rd Ed), PHI.
- Brian, O, Management Information System, TMH. 2.
- 3. Davis Olson, Management Information System, McGraw Hill.

Implementation evaluation and maintenance of the MIS: Plan the implementation - acquire floor space and plan space layouts - organize for implementation - develop procedures for implementation - train the operating personnel computer related acquisitions - develop forms for data collection and information dissemination - develop the files test the system - cut-over - document the system - evaluate the MIS control and maintain the system - Pitfalls in MIS development

9 Hrs

9 Hrs

9 Hrs

Total no. of Hrs: 45

Tv/Lb/E

TP/IE

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9 Hrs

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3

Foundation of Information System : Introduction to Information System and MIS – Decision support and decision

making systems - systems approach - the systems view of business - MIS organization within company -

9 Hrs

TITUTE EDUCAT ND RESE EMED TO BE UNIV (An ISO 21001 : 2018 Certified In Periyar E.V.R. High Road, Maduravoval, Chennai

Information Technology : A manager's overview - managerial overviews - computer hardware and software -

Conceptual system design: Define the problems - set systems objective - establish system - constraints - determine information needs determine information sources - develop alternative conceptual design and select one document the

Detailed system design : Inform and involve the organization - aim of detailed design - project management of MIS detailed design - identify dominant and trade of criteria - define the sub systems - sketch the detailed operating sub systems and information flow - determine the degree of automation of each operation - inform and involve the organization again - inputs outputs and processing - early system testing - software - hardware and tools propose an

Subject Name: MANAGEMENT INFORMATION SYSTEM

Prerequisite : Basic Knowledge in Information System

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits

T/L/ETL : Theory / Lab / Embedded Theory and Lab

Management information and the systems approach

system concept - prepare the conceptual design report

DBMS - RDBMS - Telecommunication



Subject Code: CBCA22E06	Subject N	Name: MOI	BILE CON	APUTING			Ty/Lb/E TP/IE	L	T/ S.L r	P/R	C
	Prerequis	ite : Mobil	e Commu	nication an	d Network	Security	Ту	3	0	0	3
L : Lecture T T/L/ETL : The				U U	ect R : Rese	earch C : Cre	edits				•
OBJECTIVE	ES										
 To imp To fan To pro To und 	oduce the c part the basi niliarize the wide the kno lerstand the	c concepts of concepts of owledge of Mobile Ne	of Radio F Telecomr Wireless L	requency an nunication AN and its	nd the Tran and its Net architectur	smission of works. e.	-	nals			
COURSE O			a alula 4a								
Students com CO1		d the basic		f Mobile C	omputing						
CO2	Applying t	the radio fre rs, receiver,	equency in	mobile cor	nputing are	used in cor nagnetic rac					
CO3	Implement TDMA an	t the basic d SDMA th	e mechani	sm.		multiplexin	•				
CO4	Evaluate tl LAN-IEEI	he Wireless E 802.11- A	LAN-Dest rchitecture	ign goals-W e. Simultane	Vireless tran cously use o	nsmission te of equipmen	chnology, t and reduc	Setti ce th	ings foi e wirin	r wirel g expe	ess ense
CO5	division of protocol.	f methods in	n the layere	ed architect	ure of proto	ission and p pocols in the	•		•	-	
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CO2	3				2	2	3		2		2
~~~		3	3	1	2	3	1		2		2 3
CO3	3	2	2	1	2 3	3 3	1		2 3		2 3 3
<b>CO4</b>	3 3	2 3	2 3	1 1 2	2 3 1	3 3 3	1 1 2		2 3 1		2 3 3 3
CO4 CO5	3 3 2	2 3 3	2 3 1	1 1 2 3	2 3 1 2	3 3 3 3	1		2 3 1 2		2 3 3
CO4 CO5 Cos/PSOs	3 3 2	2 3 3 801	2 3 1	1 1 2 3 802	2 3 1 2	3 3 3 3 803	1 1 2		2 3 1 2 <b>PS04</b>		2 3 3 3
CO4 CO5 Cos/PSOs CO1	3 3 2	2 3 3 <b>S01</b> 3	2 3 1	1 1 2 3 <b>S02</b> 3	2 3 1 2	3 3 3 3 <b>S03</b> 3	1 1 2		2 3 1 2 <b>PS04</b> 2		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2	3 3 2	2 3 3 <b>S01</b> 2	2 3 1	1 1 2 3 <b>S02</b> 3 1	2 3 1 2	3 3 3 3 803 2	1 1 2		2 3 1 2 <b>PS04</b> 2 3		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 2	2 3 3 <b>S01</b> 3 2 3	2 3 1	1 1 2 3 <b>S02</b> 3 1 3	2 3 1 2	3 3 3 <b>3</b> <b>3</b> <b>803</b> 3 2 1	1 1 2		2 3 1 2 <b>PS04</b> 2 3 1		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2 CO3 CO4	3 3 2	2 3 3 <b>S01</b> 2	2 3 1	1 1 2 3 <b>S02</b> 3 1	2 3 1 2	3 3 3 3 803 2	1 1 2		2 3 1 2 <b>PS04</b> 2 3		2 3 3 3
CO4 CO5 Cos/PSOs CO1 CO2 CO3	3 3 2 P	2 3 3 <b>S01</b> 3 2 3 3 2	2 3 1 P	1       1       2       3       502       3       1       3       1	2 3 1 2 P	3       3       3       3       3       2       1       2       3	1 1 2 3		2 3 1 2 <b>PS04</b> 2 3 1 3		2 3 3 3
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- Jochen Schiller (2014) Mobile Communications(2nd ed.), Pearson Education 1.
- Nithyanandam .S, Ambika.M, Gayathri K.S., "Mobile Computing", Dhanpat Rai &co.(P)Ltd 2.

### **REFERENCE:**

William C.Y.Lee(1995) Mobile Cellular Telecommunications(2nd ed.), Mc-Graw-Hill. 1.

UNIT V

access mechanism-Telecommunication Networks -GSM, Satellite communication.

Wireless LAN: Advantages of Wireless LAN-Design goals-Wireless transmission technology-Settings for wireless

LAN-IEEE 802.11: System architecture-Bluetooth

Mobile Network Layer and Transport Layer : Mobile IP-DHCP-Traditional TCP-Congestion control - mechanism to

**UNIT II** 9 Hrs

portability- Effects of device portability - Applications-Reference model

Radio Transmission: Frequency - Signals - antennas - Signal propagation- Multiplexing - Modulation-Spread Spectrum(DSSS,FHSS).

**UNIT III** 9 Hrs

Medium access control: Motivation for specialized MAC,SDMA,FDMA,TDMA,CDMA, Comparison of the Medium

alter the transmission - Classical TCP Improvements

Fundamentals of Wireless Transmission: Wireless-Wireless networks in comparison to fixed networks-Mobile communication: Development - Principles of mobile communication - Overview of mobility and portability- Issues for

**UNIT IV** 

UNIT I

L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

### C Subject Name: MOBILE COMPUTING Ty/Lb/E P/R Subject Τ/ TP/IE Code: S.L L CBCA22E06 r Prerequisite : Mobile Communication and Network Security Ty 3 0 0 3

## 9 Hrs

## 9 Hrs

## 9 Hrs

## Total No of Hrs: 45

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Code: CBCA22E07				CESSING			Ty/Lb/ ETP/IE		T / S.L r	P/R	C
	Prerequisit	te : Basic l	knowledge	e in Comp	uter Graph	ics	Ту	3	0	0	3
L : Lecture T :					ct R : Resea	rch C : Cree	dits				
T/L/ETL : The	ory / Lab / Ei	mbedded 7	Theory and	l Lab							
OBJECTIVE	5										
• To intro	duce the bas	ic principle	es of Imag	e Processir	ıg						
	uss different		1 V			0					
	ribe different										
• To know	v the need fo	or Image Co	ompressio	n and to lea	arn different	techniques	for Image	Con	npressi	ion.	
	knowledge i		methods of	f Image Seg	gmentation	and Represe	entation				
COURSE OU											
Students comp										<u> </u>	1
CO1	Review the			•	•	•••			m 2D	specia	ıl
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CO2	Implement		ipulation of	of pixels in	an image us	sing differen	nt Spatial C	ioma	in mei	nous i	or
CO3	Image Enha Operating a		uge and est	imating the	clean orig	inal imaga l	by using L	aact	maan	auara	
005	filtering and					mai mage i	by using L	cast .	mean	square	
CO4	Examine to					after compre	ession usin	g La	ossless		
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CO5						f an image					n
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Mapping of C	Locate obje	ects and bo	undaries ii	n images us	ing Edge de P <b>Os</b> )	etection and	l Region B	ased	Segm	entatic	
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UNIT I

**UNIT IV** 

## 1. Rafael C Gonzalez, Richard E Woods(2003), "Digital Image Processing(2nd. ed.), Pearson Education.

## **REFERENCES:**

1. William K Pratt(2001), "Digital Image Processing", John Willey (2001).

**TEXT BOOK:** 

UNIT V 9 Hrs

Least mean square filtering – Constrained least mean square filtering – Blind image restoration –

Transform and DFT – Properties of 2D Fourier Transform – FFT

equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters.

IMAGE ENHANCEMENT TECHNIQUES: Spatial Domain methods: Basic grey level transformation - Histogram

**UNIT II** 9 Hrs

DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS: Elements of visual perception - Image sampling and quantization Basic relationship between pixels - Basic geometric transformations-Introduction to Fourier

**UNIT III** 9 Hrs IMAGE RESTORATION: Model of Image Degradation/restoration process - Noise models - Inverse filtering -

**IMAGE COMPRESSION:** Lossless compression: Variable length coding – LZW coding – Bit plane coding predictive coding-DPCM. Lossy Compression: Transform coding - Wavelet coding - Basics of Image compression standards

IMAGE SEGMENTATION AND REPRESENTATION: Edge detection - Thresholding - Region Based segmentation - Boundary representation: chair codes- Polygonal approximation -Boundary segments -boundary descriptors: Simple descriptors-Fourier descriptors - Regional descriptors

Total No of Hrs: 45

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### Subject Subject Name: IMAGE PROCESSING Ty/Lb/ Τ/ P/R С ETP/IE Code: L S.L CBCA22E07 r Prerequisite : Basic knowledge in Computer Graphics 3 3 Ty 0 0 L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

9 Hrs



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## 1. Arshdeep Bahga & Vijay Madisetti(2016), "Cloud Computing A Hands - on Approach", Universities Press

### **REFERENCES:**

1. Kris Jamsa(2013), "Cloud Computing: SaaS, PaaS, IaaS, Virtualization, Business Models, Mobile, Security and More", Jones & Bartlett Learning, Publisher.

2. Barrie Sosinsky(2011), "Cloud Computing Bible ", Wiley Publishing.

(Django) - Designing RESTful API - Design Approaches - Image Processing App

**TEXT BOOK:** 

Subject

**CBCA22E08** 

Code:

Advanced Topics : Multimedia Cloud - Using the Mobile Cloud - Cloud Application Benchmarking and Tuning -Cloud Security - Cloud for Industry, Healthcare and Education

UNIT III 9 Hrs Phython Basics : Introduction – Installing Python – Python Data types and Data Structures- control flow – functions –

modules- Python for Cloud : Phthon for Amzon Web Services , Python for Google Cloud Platform - Python for

Cloud Application Development in Python : Python Packages of Interest - Python Web Application Framework

**Cloud Application Design:** Introduction- Scalibility- Reliability – Reference Architectures for Cliud Applications-Cloud Application Design Methodlogies : Service Oriented Arcitecture, Cloud Component Model, IaaS, PaaS and SaaS Services for Cloud Applications- Data Storage Approches

services, Application Services, Content Delivery Services UNIT II 9 Hrs

Introduction and Concepts: Defining cloud computing – Cloud models- Characteristics of Cloud Computing – Cloud based services and Applications - Cloud services and platforms: Compute Services, Storage Services, Database

T/L/ETL : Theory / Lab / Embedded Theory and Lab UNIT 1 9 Hrs

Subject Name: CLOUD COMPUTING

Prerequisite : : Rudimentary skill in Cloud concept

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits

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## Total No of Hrs: 45

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UNIT IV

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UNIT V



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## 1. https://tavaana.org/sites/default/files/introduction to opensource.pdf

2. Chris Eaton, Dirk deroos et al.(2012), "Understanding Big data", McGraw Hill.

## **REFERENCES:**

1. Greg Elmer, Ganaele Langlois, Dr. Joanna Redden(2015), "Compromised Data: From Social Media to Big Data", Bloomsbury Academic Publishing.

data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

**IoT**: Definitions - overview, applications, potential & challenges, and architecture. IoT examples: Case studies, e.g. sensor body-area-network and control of a smart home.

UNIT IV 9 Hrs

UNIT V 9 Hrs INTRODUCTION TO BIG DATA: Distributed file system - Big Data and its importance, Four Vs, Drivers for Big

Case Studies: Apache, BSD, Linux, Mozilla (Firefox), Wikipedia, Joomla, GCC, Open Office. Starting and Maintaining an Open Source Project, Open Source Hardware, Open Source Design, Open source Teaching, and Open source media.

Economics of FOSS : Zero Marginal Cost, Income-generation opportunities UNIT III 9 Hrs

Introduction to Open Source: Definition, Open Source History, Initiatives, Free Software, Free Software vs. Open Source software, Public Domain Software, FOSS does not mean no cost. History : BSD, The Free Software Foundation and Open Source GNU Project.

Principle and methodologies : Philosophy : Software Freedom, Open Source Development Model Licences and Patents: What Is A License, Important FOSS Licenses (Apache, BSD, GPL, LGPL), copyrights and copylefts, Patents

UNIT II 9 Hrs

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab UNIT I 9 Hrs

Subject Name: OPEN SOURCE PROGRAMMING

Prerequisite : Concept of Information handling

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## **Total No of Hrs: 45**

Subject

CBCA22E09

Code:



Subject Code:	Subject	Name: SOF	TWARE	FESTING			Ty/Lb/ ETP/IE	L T/	P/R	C
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Mapping of (	Course Ou	tcome with	Program	Outcome (	POs)					
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	)9
CO1	3	2	3	3	2	2	3	2	4	2
CO2	3	3	3	1	2	3	1	2		3
CO3	3	2	2	1	3	3	1	3		3
CO4	3	3	3	2	1	3	2	1		3
CO5	3	3	2	3	2	3	3	2		3
Cos/PSOs	F	PS01	P	S02	P	S03		<b>PS04</b>		
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CO2		2		2		1		3		
<b>~~</b>		3		3		1		3		
CO3						2		2		
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CO4 CO5		2	Strength ( Program Elective	3		3	m, 1- Low Skill component	3 Practical	oth	iers

**TEXT BOOK:** 1. Srinivasan Desikan and Gopalaswamy Ramesh(2007) "Software Testing – Principles and Practices", Pearson Education.

## **REFERENCES:**

- William Perry(2007), "Effective Methods of Software Testing", Third Edition, Wiley Publishing 2007 1.
- 2. Naresh Chauhan(2010), "Software Testing Principles and Practices" Oxford University Press, New Delhi, 2010.

9 Hrs

## UNIT I

Subject

CBCA22E10

Code:

Testiing Environment And Test Processes: Introduction – World Class Software Testing Model – Building a Software Testing Environment - Overview of Software Testing Process - Organizing for Testing : Requirement Specifications (Software, User, market, Business) - Static & Dynamic Testing : Verification & Validation -Analyzing and Reporting Test Results – Post Implementation Analysis

## UNIT II

Developing the Test Plan : Using White Box Approach to Test design – Code Functional Testing – Coverage and Control Flow Graphs –Using Black Box Approaches to Test Case Design – Random Testing – Requirements based testing –Decision tables –State-based testing – Cause-effect graphing – Error guessing – Compatibility testing – Levels of Testing : Functionality Testing - Performance Testing - Unit Testing - Integration Testing - System Testing - User Acceptance Testing - Compatibility Testing

## UNIT III

Software Testing Life Cycle: Software Testing Life Cycle: SDLC & STLC, Stages - System Study - Test case design, Review, Approval, Execution - Test case Templates: Header - Body & Footer Templates - Traceability Matrix - Defect Tracking Templates - Postmortem Report (Achievements & Comments) - Rapid Application Development Testing - Testing in a Multiplatform Environment - Testing Software System Security - Testing Web Applications – Web based system – Web Technology Evolution – Testing a Data base

## UNIT IV

TEST AUTOMATION : Introduction : Software Testing Tools (Win Runner, Load Runner) - Software Test Automation - Skills needed for Automation - Scope of Automation - Design and Architecture for Automation -Requirements for a Test Tool - Challenges in Automation - Tracking the Bug

## UNIT V

Quality Assurance & Quality Control : Complexity Metrics and Models - Quality Management Metrics - Defect Removal Effectiveness Quality Function Deployment - Taguchi Quality Loss Function.

## **Total No of Hrs: 45**

## 9 Hrs

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3

## 9 Hrs

9 Hrs

9 Hrs

### STITUTE EDUCA EMED TO BE UNIVE (An ISO 21001 : 2018 Certified Institution) Periyar E.V.R. High Road, Maduravoyal, Chennai-95. Tamil du, India

Subject Name: SOFTWARE TESTING Ty/Lb/ Τ/ P/R ETP/IE L S.Lr Prerequisite : OOAD & Programming Knowledge in Software 3 0 Τv 0

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

### **Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE** <u>DEMED TO BE UNIVERSITY</u> UNIVERSITY WILL STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A STATES AND A ST

CBCA22E11		ame: Artif	icial Intel	ligence			Ty/Lb/ ETP/IE			P/R	C
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• To beco	ome familia	with basic	c principle	s of AI tow	ard probler	n solving, in	ference, p	erc	eption, l	cnowle	edg
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• To expl	lore the curr	ent scope,	potential,	limitations,	and implic	ations of int	elligent sy	ste	ms.		
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COI	foundations		mai under	standing of	the history	of artificial	memgen	ce	(AI) and	115	
CO2			s of AI in s	solutions th	at require p	roblem solv	ing infere	nce	e percer	otion	
001	knowledge				at require p		ing, intere	1100	, percep	, , , , , , , , , , , , , , , , , , , ,	
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CO4	Demonstrat	e profcienc	cy in apply	ying scienti	fc method t	o models of	machine l	ear	ning.		
CO5	Demonstrat implication	•	y to share i	in discussio	ons of AI, it	s current sco	ope and lin	nita	ations, a	nd soc	ieta
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CO2	3	3	3	1	2	3	1		2	3	3
CO3	3	1	2	2	3	3	2		3	3	3
CO4	3	3	3	2	1	3	2		1	3	3
CO5	3	3	2	3	2	3	3		2		3
Cos/PSOs	PS	01	Р	S02	Р	S03			<b>PS04</b>		
CO1	3	3		3		2			2		
CO2	2	2		3		2			3		
	3	3		2		1			3		
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## **WEB REFERENCES:**

- NPTEL & MOOC courses titled Artificial Intelligence and Expert Systems
- https://nptel.ac.in/courses/106106140/
- https://nptel.ac.in/courses/106106126/ •

ETP/IE Code: L S.Lr CBCA22E11 Prerequisite : Strong knowledge of Mathematics, Good 30 Tv command over programming languages and Good Analytical Skills. L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

Subject Name: Artificial Intelligence

### UNIT I

Subject

Introduction: AI Problems – AI techniques – Criteria for success. Problems, Problem Spaces, Search: State space search – Production Systems – Problem Characteristics – Issues in design of Search.

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### **UNIT II**

Heuristic Search techniques: Generate and Test - Hill Climbing - Best-Fist, Problem Reduction, Constraint Satisfaction, Means-end analysis.

### **UNIT III**

Knowledge representation issues: Representations and mappings - Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

### **UNIT IV**

UNIT V

Using Predicate Logic: Representing simple facts in logic – Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction

Representing knowledge using rules: Procedural Vs Declarative knowledge - Logic programming - Forward Vs Backward reasoning – Matching – Control knowledge Brief explanation of Expert Systems.

### **TEXT BOOK:**

1. Elaine Rich and Kevin Knight, Shiva Shankar Nair, "Artificial Intelligence", McGraw-Hill Companies, 3rd edition.

### **REFERENCE BOOKS:**

1. Stuart Russell & Peter Norvig, "Artificial Intelligence A Modern Approach", Perason, 2nd Edition.

2. George F Luger, "Artificial Intelligence", Pearson 2002, 4th Edition.

3. V S Janaki Raman, K Sarukesi, P Gopalakrishnan, "Foundations of Artificial Intelligent and Expert Systems", MacMillan India limited.

## **Total No of Hrs: 45**

## 9 Hrs

9 Hrs

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9 Hrs

## 9 Hrs



Subject Code:	Subject Na	ame: <b>Desi</b> g	gn Thinki	ng			Ty/Lb/E TP/IE	L	T / S.Lr	P/R	C	
CBCA22E12	challenge	s of the en	d user.		problems,		Ту	3	0	0	3	
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	eory / Lab / E	mbedded 7	Theory and	l Lab								
OBJECTIVI	ES											
•	Understand	-	-	-	~ ~							
•	Create desig	•			•	•						
•	Apply both		•	•	•		e problems					
•	Apply some	design thi	nking cond	cepts to the	ir daily wo	ſĸ						
	UTCOMES (											
	pleting this co			1 1								
C01	Define the	1		6	0							
CO2	Explain the			-	-							
CO3	Apply the	design thi	nking tec	hniques fo	or solving	problems in	n various s	secto	ors.			
CO4	Analyse to	work in a	a multidis	ciplinary o	environme	nt.						
CO5	Evaluate th	ne value o	f creativi	ty.								
Mapping of	Course Outco	me with I	Program (	Dutcome (I	POs)							
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07		PO8	P	09	
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CO2	3	3	3	1	2	3	1		2		3	
CO3	3	2	2	1	3	3	1		3		3	
CO4	3	3	3	2	1	3	2		1		3	
CO5	3	3	2	3	2	3	3		2		3	
Cos/PSOs	PS	01	P	S02	Р	S03		]	PS04			
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CO2	2	2		2		1			3			
CO3	3	8		3		1			3			
CO4	3	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							3			
CO5	3	3		3		2			2			
			-		-	h, 2- Mediu		1				
Category	H&S Pr	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Р	ractical Project/ ternship	oth	hers	

### user. L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credit T/L/ETL: Theory / Lab / Embedded Theory and Lab

Subject Name: **Design Thinking** 

## **Unit One: Introduction to Design Thinking**

Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry. 9 Hrs

Prerequisite : Understanding the needs, problems, and challenges of the end

### Unit Two : Design thinking for innovation **Design Thinking Process**

Subject Code:

CBCA22E12

Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking -person, costumer, journey map, brain storming, product developmentActivity:Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

### Unit Three Design thinking for innovation

### Innovation

Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity. Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

### Unit Four Design thinking for innovation

### **Product Design**

Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications. Innovation towards product design Case studies. Activity: Importance of modelling, how to set specifications, Explaining their own product design.

## **Unit Five : Design thinking for innovation**

### **Design Thinking in Business Processes**

Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business -Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization. Design thinking to meet corporate needs.Design thinking for Startups. Defining and testing Business Models and Business Cases. Developing & testing prototypes. Activity: How to market our own product, About maintenance, Reliability and plan for startup.

### **Design thinking for innovation Course Objectives**

The objective of this course is to familiarize students with design thinking process as a tool for breakthrough innovation. It aims to equip students with design thinking skills and ignite the minds to create innovative ideas, develop solutions for real-time problems.

### **Design thinking for innovation Course Outcomes**

- Define the concepts related to design thinking
- .•Explain the fundamentals of Design Thinking and innovation
- •Apply the design thinking techniques for solving problems in various sectors
- .•Analyse to work in a multidisciplinary environment
- •Evaluate the value of creativity

•Formulate specific problem statements of real time issues

### **Design thinking for innovation Text Books**

1. Change by design, Tim Brown, Harper Bollins (2009) 2. Design Thinking for Strategic Innovation, Idris Mootee, 2013, John Wiley & Sons.

### **Design thinking for innovation Reference Books**

1. Design Thinking in the Classroom by David Lee, Ulysses press 2. Design the Future, by Shrrutin N Shetty, Norton Press 3. Universal principles of design-William lidwell, kritinaholden, Jill butter. 4. The era of open innovation -chesbrough.H

### **Total Hrs:45**

9 Hrs

9 Hrs

### 9 Hrs

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Subject Code: CBCA22E13		lame: <b>Block</b>					Ty/Lb /ETP/ IE	L T/ S.Lr	P/R	С
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L : Lecture T T/L/ETL : The	: Tutorial S eory / Lab /	Lr : Supervi			et R : Resea	rch C : Cred	its			
OBJECTIVE	ES									
• To imp	ess blockcha part knowled familiarity	lge in block	chain tech	niques and	able to pres	ent the conc to token.	epts clearly	and structu	ired.	
COURSE OU		· · ·								
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CO5		d the moder	<u> </u>	es and its ma	arket usuag	e				
Mapping of (	Course Out	come with	Program (	Dutcome (P	POs)					
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	<b>09</b>
CO1	3	2	3	3	2	2	3	2		2
CO2	3	3	3	2	1	3	2	1		3
CO3	3	2	2	1	3	3	1	3		3
CO4	3	3	3	2	1	3	2	1		3
CO5	3	3	2	3	2	3	3	2		3
Cos/PSOs	Р	S01	F	PS02 PS03				<b>PS04</b>		
CO1		3		3	2					
CO2		2		2		1		3		
CO3		3		2		1		3		
CO4		3		3		3		3		
CO5		2		3		3	3			
	3/2	2/1 Indicates	s Strength	Of Correlati	on, 3 – Hig	h, 2- Mediu	m, 1- Low			
ategory	H&S I	Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplina ry/Allied	Skill component	Practical Project/ Internship	ot	hers
			λ							

## Atomic Broadcast, Consensus, Byzantine Models of fault tolerance, Hash functions, Puzzle friendly Hash, Collison

UNIT - 5 Privacy, Security issues in Blockchain:

**UNIT - 3 Bitcoin basics:** 

**UNIT - 4 Ethereum basics:** 

Bitcoin blockchain, Challenges and solutions, proof of work, Proof of stake, alternatives to Bitcoin consensus, Bitcoin scripting language and their use

Ethereum and Smart Contracts, The Turing Completeness of Smart Contract Languages and verification challenges, Using smart contracts to enforce legal contracts, comparing Bitcoin scripting vs. Ethereum Smart Contracts, Writing smart contracts using Solidity & JavaScript

Pseudo-anonymity vs. anonymity, Zcash and Zk-SNARKS for anonymity preservation, attacks on Blockchains: Sybil attacks, selfish mining, 51% attacks advent of algorand; Sharding based consensus algorithms to prevent these attacks

## **UNIT - 6 Case Studies:**

Block chain in Financial Service, Supply Chain Management and Government Services

List of References:

1. Narayanan, Bonneau, Felten, Miller and Goldfeder, "Bitcoin and Cryptocurrency Technologies - A Comprehensive Introduction", Princeton University Press.

2. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guild to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.

3. Imran Bashir, "Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained", Packt Publishing.

4. Merunas Grincalaitis, "Mastering Ethereum: Implement Advanced Blockchain Applications Using Ethereumsupported Tools, Services, and Protocols", Packt Publishing.

5. Prof. Sandip Chakraborty, Dr. Praveen Jayachandran, "Blockchain Architecture Design And Use Cases" [MOOC], NPTEL: https://nptel.ac.in/courses/106/105/106105184/

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	Subject	Subject Name: Block Chain Technology	Ty/Lb		Τ/	P/R	С
	Code:		/ETP/	L	S.Lr		
	CBCA22E13		IE				
		Prerequisite : Be well versed in concepts such as cryptography, consensus, hash functions, distributed ledgers, smart contracts and any other concepts integral to understanding block chain's inner workings.	Ту	3	0	0	3
UN	IT - 1 Introduc	tion:	9 Hrs				

## **UNIT - 1 Introduction:**

Need for Distributed Record Keeping, Modeling faults and adversaries, Byzantine Generals problem, Consensus algorithms and their scalability problems, Nakamoto's concept with Blockchain based cryptocurrency, Technologies Borrowed in Blockchain – hash pointers, consensus, byzantine fault-tolerant distributed computing, digital cash etc.

## **UNIT - 2 Basic Distributed Computing & Crypto primitives:**

resistant hash, digital signatures, public key crypto, verifiable random functions, Zero-knowledge systems

9 Hrs

**Total 45 Hrs** 

9 Hrs

9 Hrs



Subject Code: CBCA22E14	Subject Name: INTERNET OF THINGS Prerequisite : : Basic knowledge in Networks and Interview						Ty/Lb/ ETP/IE		T / S.L r	P/R	C
	Prerequisit Concepts	te : : Basic	knowledg	ge in Netwo	orks and In	ternet	Ту	3	0	0	3
L : Lecture T					ect R : Rese	arch C : Cre	edits				•
T/L/ETL : The	eory / Lab / E	Embedded '	Theory and	d Lab							
OBJECTIVE	S										
To imp	art the basic	design and	l communi	cation mod	lel of Intern	net of Thing	gs.				
• To und	erstand State	e of the Art	- Internet	of Things	Architectur	e.					
To prov	vide knowled	lge about p	protocols u	sed in Inter	rnet of Thin	gs.					
• To intr	oduce about	various in	terfaces ap	plied in In	ternet of Th	ings.					
	sify the real						-	on.			
	vide ideas of		n and its ap	pplications	using Inter	net of Thing	gs.				
COURSE OU											
Students com				6 (75)		1			1.1.	•11	
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CO2	and render 1						to offectiv			ntation	
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001					to be used	n any Inter	met of Thi	ngs	applica	tion.	
CO3	Capacity to			-				0			
CO4	Design and	develop an	ny smart re	al time app	olication in 1	nternet of '	Things.				1
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## **TEXT BOOKS**

- 1. From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence by Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, StamatisKarnouskos and David Boyle
- Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. 2.

## REFERENCES

1. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013

Subject Name: INTERNET OF THINGS P/R Subject Ty/Lb/ Τ/ Code: ETP/IE L S.L CBCA22E14 r Prerequisite : : Basic knowledge in Networks and Internet Ty 3 0 0 **Concepts** L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

UNIT I

**UNIT II** 

IOT INTRODUCTION : Introduction - Physical Design - Logical Design - IOT Communication Model - IOT Enabling Technologies - IOT Levels and Deployment Templates.

IOT NETWORK ARCHITECTURE : One M2M IOT Standardized Network Architecture- IOTWF (IOT World Forum) - IOT Architecture- M2M (Machine to Machine) -SDN (Software Defined Network) -NFV (Network Function Virtualization).

IOT PROTOCOLS : NFC (Near Field Communication)- RFID (Radio Frequency Identification System) -ZIGBEE-SPMI (System Power Management Interface)-SPI (Serial Peripheral Interface)-Wireless vs. Wired Communication-GSM-GPRS-LTE (Long Term Evolution).

IOT DESIGN : Design Methodology-Microcontroller- System on Chip (SoC)-IOT System Building Blocks- Arduino-Raspberry-pi

DOMAIN SPECIFIC IOT : Home Automation- Cities- Agriculture- Environment-Health and Life Style- Industry

# **UNIT III**

UNIT IV

UNIT V

9 Hrs

9 Hrs

9 Hrs

9 Hrs

С

3

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u. India

9 Hrs

**Total No of Hrs: 45** 



Subject Code:	Subject Na	ame: <b>Data</b>	Analytics				Ty/Lb/ ETP/IE		'/ .Lr	P/R	C
CBCA22E15	Excel, R of skills, Data	r Python, <mark>l</mark> a visualiza	Presentation	on and cri	ent in Micr tical thinki	ng	Ту	3 0		0	3
L : Lecture T : T/L/ETL : The					ct R : Resea	rch C : Cre	dits				
OBJECTIVES	5										
• To unde	y statistical a erstand storag s a student to ions.	ge, retrieva	l and proc	essing of bi	ig data		-		ositiv	ve	
COURSE OU											
Students comp											
C01	Understand	U		•							
CO2	Analyze the Data to gen			k like Hado	oop and NO	SQL to effi	ciently stor	re and j	proce	ss Big	5
CO3	Design of A	lgorithms	to solve D	ata Intensi	ve Problems	s using Map	Reduce P	aradig	m.		
CO4	Design and problems ar				nalytics usin	g pig and s	park to sol	ve data	a inter	nsive	
CO5	Implement			-							
Mapping of C	ourse Outco	me with <b>H</b>	Program (	<b>)utcome</b> (I	POs)						
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO	08	P	09
CO1	3	2	3	3	2	2	3	4	2		2
CO2	2	3	3	1	2	3	1	4	2		3
CO3	3	2	2	3	3	1	3	1	3		1
CO4	2		2			_	2	-		-	
0.04	3	3	3	2	1	3	2		1		3
C04 C05	3	3 3	3	2 3	1 2			1			3 3
		3	2		2	3	2	1	1		
CO5	3	3 01	2	3	2 P\$	3 3	2	PS	1 2		
CO5 Cos/PSOs	3 <b>PS</b>	3 01	2	3 <b>S02</b>	2 PS	3 3 503	2	PS	1 2 <b>504</b>		
CO5 Cos/PSOs CO1	3 PS	3 01	2	3 <b>S02</b> 3	2 PS	3 3 503 2	2	1 PS	1 2 <b>504</b> 2		
CO5 Cos/PSOs CO1 CO2	3 PS 3 2	3 01	2	3 <b>S02</b> 3 2	2 PS	3 3 503 2 3	2	PS	1 2 5 <b>04</b> 2 1		
CO5 Cos/PSOs CO1 CO2 CO3	3 PS 3 2 3 3 3 2 2	3 01	2 P	3 <b>S02</b> 3 2 3 3 3 3	2 PS	3 3 603 2 3 1 2 3 3	2 3	PS	1 2 <b>504</b> 2 1 3		
CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 PS 3 2 3 3 3 3 3 2 3/2/1	3 01 Indicates	2 P Strength O	3 <b>S02</b> 3 2 3 3 3 3	2 PS on, 3 – Higt	3 3 503 2 3 1 2 3 3 , 2- Mediu	2 3 m, 1- Low	PS	1 2 504 2 1 3 3		
CO5 Cos/PSOs CO1 CO2 CO3 CO4 CO5	3 PS 3 2 3 3 3 3 3 2 3/2/1	3 01	2 P	3 <b>S02</b> 3 2 3 3 3 3	2 PS on, 3 – Higt	3 3 603 2 3 1 2 3 3	2 3 m, 1- Low	Prac Proj	1 2 <b>304</b> 2 1 3 3 2		

## **OUTCOMES:**

## At the end of this course, the students will be able to:

- Understand how to leverage the insights from big data analytics
- Analyze data by utilizing various statistical and data mining approaches
- Perform analytics on real-time streaming data
- Understand the various NoSql alternative database models

### UNIT I **INTRODUCTION TO BIG DATA**

T/L/ETL : Theory / Lab / Embedded Theory and Lab

Subject Name: Data Analytics

skills,Data visualization

Big Data - Definition, Characteristic Features - Big Data Applications - Big Data vs Traditional Data - Risks of Big Data - Structure of Big Data - Challenges of Conventional Systems - Web Data - Evolution of Analytic Scalability -Evolution of Analytic Processes, Tools and methods - Analysis vs Reporting - Modern Data Analytic Tools.

### **UNIT II HADOOP FRAMEWORK**

Distributed File Systems - Large-Scale FileSystem Organization - HDFS concepts - MapReduce Execution, Algorithms using MapReduce, Matrix-Vector Multiplication – Hadoop YARN.

### **UNIT III DATA ANALYSIS**

Subject

CBCA22E15

Code:

Statistical Methods: Regression modelling, Multivariate Analysis - Classification: SVM & Kernel Methods - Rule Mining - Cluster Analysis, Types of Data in Cluster Analysis, Partitioning Methods, Hierarchical Methods, Density Based Methods, Grid Based Methods, Model Based Clustering Methods, Clustering High Dimensional Data -Predictive Analytics – Data analysis using R.

### **UNIT IV** MINING DATA STREAMS

Streams: Concepts - Stream Data Model and Architecture - Sampling data in a stream - Mining Data Streams and Mining Time-series data - Real Time Analytics Platform (RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

### UNIT V **BIG DATA FRAMEWORKS**

Introduction to NoSQL - Aggregate Data Models - Hbase: Data Model and Implementations - Hbase Clients -Examples - .Cassandra: Data Model - Examples - Cassandra Clients - Hadoop Integration. Pig - Grunt - Pig Data Model – Pig Latin – developing and testing Pig Latin scripts. Hive – Data Types and File Formats – HiveQL Data Definition - HiveQL Data Manipulation - HiveQL Queries.

### **Total No of Hrs: 45**

# 9 Hrs

## 9 Hrs

### 9 Hrs

P/R

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Ty/Lb/

Ty

ETP/IE

## 9 Hrs

## 9 Hrs



Prerequisite : Knowledge in SQL, Proficient in Microsoft

Excel, R or Python, Presentation and critical thinking

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits



Subject Code: CBCA22OE1	Subject Na				Ty/Lb/ ETP/IE		T / S.L r	P/R	C			
	Prerequisi	te : <b>Recog</b>	nize good	visual desi	gn		Ту	3	0	0	3	
L : Lecture T : T		·	Ų		R : Researc	ch C : Credit	S			•		
T/L/ETL : Theor	y / Lab / Eml	bedded Th	eory and L	.ab								
OBJECTIVES												
• Under	stand the impo	ortance of the	he web as a	medium of o	communicati	on.						
	stand the prir	nciples of c	creating an	effective we	eb page, inc	luding an in	-depth cons	sider	ation o	f infor	matic	
archite		of the web	UTM on									
COURSE OUT	the language			1 CSS.								
Students complete			ble to									
CO1				he formalis	tic (aesthe	tic) aspects	of design	and	visual	l		
	communica						_					
CO2	Demonstra	ate cross-	platform	storytellin	g skills.							
CO3	To develop media proj		erstanding	of informa	tion design	n and usabi	lity as it aj	pplie	es to in	iteract	tive	
CO4		ing and so				sent data in ia.	a professi	iona	l manı	ner th	at	
CO5	Become fai real world		h graphic o	lesign and	/or game tl	heory and b	e able to a	pply	y this t	heory	' to	
Mapping of Cou			ogram Ou	tcome (PC	s)							
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	]	PO8	P	09	
CO1	3	2	3	3	2	2	3		2	,	2	
CO2	3	3	3	1	2	3	1		2		3	
CO3	3	2	2	1	3	3	1		3	,	3	
CO4	3	3	3	2	1	3	2		1	,	3	
CO5	3	3	2	3	2	3	3		2		3	
Cos/PSOs	PS	01	Р	S02	P	<b>S03</b>	PS04					
CO1	3	3		3		2			2			
CO2	2	2		2		1			3			
CO3	3	3		3		1			3			
CO4	3	3		3		2			3			
CO5	2	2		3		3	3					
	3/2/1 ]	Indicates S	Strength Of	Correlatio	n, 3 – High	, 2- Mediun	-					
Category	H&S Pr	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	P	actical roject/	oth	hers	
	I				elective			Jnte	ernship			

Thomas A. Powell(1999), *HTML: The Complete Reference*(2nd. ed.), Bpb Publication.

**REFERENCES:** 

Ed. Wilson (2006), *Microsoft VBScript: Step by Step*, Microsoft Press. Sterling Hughes(2001) *PHP:Developers's Cook book*,BPB publications. Ivan N Bayross(2000), Web Enabled Commercial Applications Development Using, HTML, DHTML, Java Script, Perl CGI(2nd ed.), BPB Publications.

UNIT I

Subject Code:

CBCA22OE1

Web Publishing: Web browser - WWW - Web design process: Implementation, Maintenance Phases of Website -

Web Publishing - HTML Documents: Overview, rules guidelines, structure of HTML documents, document types.

UNIT II

 $\label{eq:html} \textbf{HTML Tags: <} HTML > - < HEAD > - < TITLE > , < BODY >, < Marquee > - Paragraphs - Lists - Text Formatting, \\$ 

<Font>, Text Styles - Adding Graphics to HTML Docuements- Linking Documents.

## UNIT III

Tables, Frame and Forms: Table tag and its Attributes - Frame: Overview of frame, Frameset - Simple frame,

Frame targeting - Forms: Form objects and Methods.

Subject Name: WEB DESIGN

T/L/ETL : Theory / Lab / Embedded Theory and Lab

Prerequisite : Recognize good visual design

L : Lecture T : Tutorial SLr : Supervised Learning P: Project R : Research C : Credits

## UNIT IV

UNIT V

**DHTML**: Introduction to Dynamic HTML – CSS – Addition Style to a Document : Linking to a Style Sheet - Embedding and Importing Style Sheet.

**Introduction to PHP** : Including PHP in a page - Data types - Arrays -Regular expressions - Functions-Managing Cookies - Maintaining Sessions.

## Total No of Hrs: 45

# 9 Hrs



docume 9 Hrs

9 Hrs

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9 Hrs



Subject Code: CBCA22OE2	Subject N	ame: E-Co	ommerce		Ty/Lb/ ETP/IE		'/ .L	P/R	C		
	Prerequisi	te : Know	the usage	of internet			Ту	3 0		0	3
L : Lecture T : Tute T/L/ETL : Theory /		<b>.</b>	•		: Research	C: Credits	1 1	I			
OBJECTIVES											
• To obtain kr	nowledge of	Internet h	ardware as	sociated with	th E-comm	erce systems	8.				
Gain knowle	edge of selec	cted Stand	ard applica	tion commo	only used in	n business.					
Ability to de	esign, a fund	lamental E	-Business o	concept.							
<ul><li>Gain knowle</li><li>Introduction</li></ul>											
COURSE OUTCO											
Students completin											
CO1						the user env					
CO2	Demonstra	te the abili	ty to perfor	rm complex	a data mana	gement and	analysis.				
CO3	Understand	I the proce	sses of dev	eloping and	l implemen	ting information	ation system	ns.			
CO4	Be aware o	f the ethic	al, social, a	nd security	issues of in	nformation s	systems.				
CO5						nent informa		ns.			
<b>Mapping of Cours</b>	se Outcome	with Prog	gram Outc	ome (POs)							
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO	)8	Р	09
CO1	3	2	3	3	3	2	3	3	3	2	2
CO2	2	3	3	1	2	3	1	2	2		3
CO3	3	2	2	2	3	3	2	3	3		3
CO4	3	3	3	1	1	3	1	1			3
CO5	2	3	3	3	2	3	3	2	2		3
Cos/PSOs	PS	501	Р	<b>S02</b>	Р	S03		PS	504		
CO1		3		3		1		,	2		
CO2	1	2		3		2			3		
CO3		3		2		1			3		
CO4		3		3		2			3		
CO5		2		3		3			3		
			U		6	2- Medium,					
Category F	H&S Pi	rogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Prac Proj Interr	ect/	oth	ners



Subject Code: CBCA22OE2	Subject Name: E-Commerce	Ty/Lb/ ETP/IE	L	T / S.L	P/R	C
				r		
	Prerequisite : Know the usage of internet.	Ту	3	0	0	3
L : Lecture T : Tut	orial SLr : Supervised Learning P: Project R : Research C : Credits					•
T/L/ETL : Theory	/ Lab / Embedded Theory and Lab					
UNIT-I:					9 Hrs	

### **UNIT-I:**

Electronic Commerce Framework - Electronic Commerce and Media Convergence - The anatomy of E-Commerce Applications - Electronic Commerce Consumer Applications - Electronic Commerce Organization Applications. Market forces influencing the I-Way - Components of the I-Way - Net work Access Equipment - The Last Mile: Local Roads and Access Ramps - Global Information Distribution Networks - Public Policy issues shaping the IWay.

### **UNIT-II**

Architectural Framework for Electronic Commerce - World Wide Web (WWW) as the Architecture- Web Background: Hypertext Publishing - Technology behind the Web Security and the Web. - Consumer-Oriented Applications -Mercantile models form the consumer's perspective – Mercantile models from the merchant's perspective.

### **UNIT-III**

Types of Electronic Payment systems - Digital token based electronic payment systems - Smart Cards and Electronic Payment Systems - Credit card based electronic Payment Systems - Risk and Electronic Payment Systems - Risk and Electronic Payment Systems - Designing Electronic Payment Systems. Electronic Data Interchange - EDI Applications in business - EDI: Legal, Security and Privacy issues - EDI and electronic Commerce.

### **UNIT-IV**

Internet information systems - Macroforces and internal commerce - Works flows automation and Co-ordination -Customization and internal commerce - Supply chain commerce system - Making a business case for a document library - Types of digital documents - Issues behind Document infrastructure - Corporate data warehouse.

### **UNIT-V**

The new age of information - based marketing - Advertising on the internet - Charting the On-Line Marketing process -Market research - search and resource Discovery Paradigms - Information Search and Retrieval - Electronic Commerce Catalogs or directories - Information Filtering - Consumer Data Internet Emerging Tools.

### **TEXT BOOKS**

1. Jeffery F.Rayport, Bernard J.Jaworski, "E-Commerc e", TMCH, 2002. 2.P.T. Joseph, "E-commerce - A Managerial Perspecti ve", PHI, 2003.

### **REFERENCE BOOKS:**

1. Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Pearson Edu., 2003

## 9 Hrs

9 Hrs

9 Hrs

## 9 Hrs

## **Total 45 Hrs**

### 141



Subject Code: CBCA22OL1	Subject N	ame: WEB	DRY	Ty/Lb/ ETP/IE	L T/ S.Lr	P/R	C			
	Prerequisi	te : Have	the knowl	edge of the	foundatio	ns of UX	Lb	0 0	4	2
L : Lecture T : T T/L/ETL : Theor		<b>.</b>		0 5	t R : Resear	ch C : Cred	its			1
OBJECTIVES	:									
<ul> <li>Informat</li> <li>Become theories</li> </ul>	ion archited	cture. h graphic e.	design pri	nciples tha	it relate to	web design		considerati how to imp		
COURSE OUT	COMES (C	Cos)								
Students comple			able to							
CO1	Discover h			eally, what	makes web	sites work.				
CO2	Make Form	ns and vali	dations for	your webs	ite.					
CO3	Writing val									
CO4	Pro level sk					tent straters	gy for your	website.		
CO5	Setting up J	page layou	it, color sch	nemes, cont	tract, typogi	aphy in the	designs			
Mapping of Co	urse Outco	me with P	rogram O	utcome (P	Os)					
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	P09
CO1	3	2	3	2	3	2	2	3		2
CO2	3	3	3	1	3	3	1	3		3
CO3	3	2	2	2	2	3	2	2		3
CO4	3	3	3	1	1	3	1	1		3
CO5	2	3	3	3	2	3	3	2		3
Cos/PSOs	PS	501	P	S02	P	<b>S03</b>		<b>PS04</b>		
CO1		3		3		1		2		
CO2	2	2		3		2	3			
CO3	3	3		2		1		3		
CO4	3	3		3		2		3		
CO5	2 3 3 3									
	3/2/1	Indicates	Strength O	f Correlatio	on, 3 – High	, 2- Mediur	n, 1- Low			
Category H	I&S Pr	rogram core	Program Elective	Open elective	Skill enhancing	Interdisciplin ary/Allied	Skill component	Practical Project/	ot	thers
			Licenve	V	elective		· · · · · · · · · · · · · · · · · · ·	Internship		



Subject Code: CBCA22OL1	Subject Name: WEB PAGE DESIGNING LABORATORY	Ty/Lb/ ETP/IE		T / S.Lr	P/R	С
	Prerequisite : Have the knowledge of the foundations of UX	Lb	0	0	4	2
	utorial SLr : Supervised Learning P: Project R : Research C : Credi y / Lab / Embedded Theory and Lab	ts				

### List of experiments

- 1.Program to illustrate Text Formatting tags.
- 2. Create a web page using ordered list and unordered list.
- 3. A program to illustrate Hyperlink tag(Anchor tag).
- 4. Create a webpage which contains table with its Attributes.
- 5. Create a Web Page using frame tag with its attributes.
- 6. Create a webpage using img tag..
- 7. Create a web page using form tag.
- 8. Use Cascading Style Sheet to create web page.
- 9. Write a PHP program for Login Validation.
- 10. Finding page hit count and setting page expiry using PHP.

### Total No of Hrs needed to complete the Lab: 60



Subjec HBCC	et Code : 22003	Subject N	lame : I	Researcl	n Methodo	ology		Ty/Lb/E TL	L	T/ SLr	P/R	С
		Prerequis	site : No	one				Ту	2	1/0	0/0	3
	ture T : Tu L : Theory		-		0	•	tR:	Research	C: Cre	dits	I I	
<ul> <li>Desi</li> <li>Anal</li> <li>Carry</li> <li>Under Trad</li> </ul>	TIVES : gn and forn yze researc y out resear erstand the emarks.	h related in ch problem filing paten	formation individ t applica	on and st ually in ations pr	tatistical m a perfect s	cientific 1	netho	d	cools of 1	IPR, Cop	yright, a	and
	SE OUTCO		e were a	ble to	roblem							
CO1		esearch rela				ical meth	ods ir	research.				
CO3	Carry out	research pr	oblem iı	ndividua	lly in a per	rfect sciei	ntific	method				
<b>CO4</b>	Understan	d Patent Fi	ling app	lication	Process.							
CO5	Patent Sea	urch and var	rious too	ols used.								
	g of Cours											
COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	3	2	2	3	3	3	3	3	3
CO2	3	2	1	3	3	1	1	1	1	1	1	3
CO3	3	3	2	1	2	2	3	3	3	3	3	1
CO4	3	3	2	2	1	2	2	2	2	3	2	2
CO5	3	3	3	3	3	2	3	3	3	2	3	3
Categor y	H&S	Program core		ogram ective	Open elective	Skill enhanci electiv	ng	Interdiscipl inary/Allie d	Skill compo nent	Pract Proje Intern	ect/	others
	$\checkmark$											

# Intellectual property rights (IPR) patents copyrights Trademarks Industrial design geographical indication. Ethics of

Τ/

SLr

1/0

P/R

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С

3

L

2

# 9 Hrs

9 Hrs

# 9 Hrs

9 Hrs

# **Total 45 Hrs**

1. K. S. Bordens, and B. B.Abbott, "Research Design and Methods – A Process Approach", 8th Edition, McGraw Hill, 2011. 2. C. R. Kothari, "Research Methodology – Methods and Techniques", 2nd Edition,

# New AgeInternational Publishers

### **HBCC22003** ETL **Prerequisite : None** Ty

(Ar Perivar E.V.R. H

Subject Name : Research Methodology

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits T/L/ETL : Theory / Lab / Embedded Theory and Lab

### **Course objective:**

**Subject Code :** 

• Learn the meaning of interpretation, techniques of interpretation, precautions is to be taken in interpretation for research process,

STITUTE (

du, India

Tv/Lb/

- Application of statistical methods in research.
- Learn intellectual property rights and its constituents.

### Unit 1

9 Hrs Introduction to research, Definitions and characteristics of research, Types of Research, Research Process, Problem definition, Objectives of Research, Research Questions, Research design, Quantitative vs. Qualitative Approach, Building and Validating Theoretical Models, Exploratory vs. Confirmatory Research, Experimental vs. Theoretical Research, Importance of reasoning in research.

### Unit 2

Problem Formulation, Understanding Modeling & Simulation, Literature Review, Referencing, Information Sources, Information Retrieval, Indexing and abstracting services, Citation indexes, Development of Hypothesis, Measurement Systems Analysis, Error Propagation, Validity of experiments, Statistical Design of Experiments, Data/Variable Types & Classification, Data collection, Numerical and Graphical Data Analysis: Sampling, Observation, Interpretation of Results.

### Unit 3 (This Unit has to be handled by Mathematics Faculty)

Statistics: Probability & Sampling distribution, Estimation, Measures of central Tendency, Arithmetic mean, Median, Mode, Standard deviation, Co efficient of variation (Discrete serious and continuous serious), Hypothesis testing & application, Correlation & regression analysis, Orthogonal array, ANOVA, Standard error, Concept of point and interval estimation, Level of significance, Degree of freedom, Analysis of variance, One way and two way classified data, 'F' test.

### Unit 4

Preparation of Dissertation and Research Papers, Tables and illustrations, Guidelines for writing the abstract, introduction, methodology, results and discussion, conclusion sections of a manuscript. References, Citation and listing system of documents.

### Unit 5

Research Scientific Misconduct Forms of Scientific Misconduct. Plagiarism, Unscientific practices in thesis work,

# **Text Book:**

Ethics in science.

### **Dr. M.G.R. EDUCATIONAL AND RESEARCH INSTITUTE** <u>DEEMED TO BE UNIVERSITY</u> <u>UNIVARITY WILL GRACELATIONARY STOLE</u> (An ISO 21001: 2018 Cortified Institution) Periyar E.V.R. High Boad, Maduravoyal, Chennai-95, Tamilnadu, India.

		Pe	riyar E.V.Ŕ. High R	toad, Maduravoyal,	Chennai-95. Tamilr	adu, India.				
Subject Code:	Subject Nai	me: DATA	VISUAL	JZATION	[		T/L/ ETL	L T / S.Lr	P/R	C
CBCA22013	Prerequisite Metrics.	e : Knows	Digital M	arketing N	letrics, So	cial Media	Lb	3 1	0	4
L : Lecture T :					ct R : Resea	arch C : Creo	lits	L	1	
T/L/ETL : The	•	mbedded 1	heory and	l Lab						
OBJECTIVE										
	rpret data p			l core data	visualizat	ion concept	ts such as	correlatio	n, line	ear
relatior	ships, and l	log scales.								
• To exp	lore the rela	tionship b	between t	wo continu	ious varial	oles using s	catter plo	ots and lin	e plot	s.
• To tran	slate and pr	esent data	and data	correlatio	ons in a sin	nple way, d	ata analys	sts use a w	ide ra	nge
of tech	niques — cł	harts, diag	grams, ma	ips, etc.						
COURSE OU										
Students comp				<u></u>		11 5				
C01			_			and key Te				
CO2					1	pping and I				
CO3				-	-	ntation of <b>E</b>				
CO4	Will demo	onstrate un	derstandi	ng of Visu	alization o	classificatio	on and its	technique	s.	
CO5				ating diffe	erent types	of Represe	ntation M	lapping wi	th	
	Programm									
Mapping of C					-	1	1			
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	)9
CO1	3	2	3	2	3	2	2	3	2	2
CO2	3	3	3	1	3	3	1	3	3	3
CO3	3	2	2	2	2	3	2	2	3	3
CO4	3	3	3	1	1	3	1	1	3	}
CO5	2	3	3	3	2	3	3	2	3	}
Cos/PSOs	PS	01	P	<b>S02</b>	P	S03		<b>PS04</b>		
CO1	3	3		3		1		2		
CO2	2	2		3		2		3		
CO3	3	3		2		1		3		
CO4	3	3		3		2		3		
CO5	2	2		3		3		3		
			•			n, 2- Mediur	n, 1- Low			
Category	H&S Pr	ogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Practical Project/ Internship	oth	ers

Visualization of volumetric data, vector fields, processes and simulations, Visualization of maps, geographic

information, GIS systems, collaborative visualizations, evaluating visualizations.

# **Reference Books**

- 1) Bateman, S., R. Mandryk, C. Gutwin, A. Genest, D. McDine, and C. Brooks. 2010.
- 2) Becker, R. A., W. S. Cleveland, and M.-J. Shyu. 1996.
- 3) Bergstrom, C. Τ., and J. West. 2016. "The Principle of Proportional Ink." http://callingbullshit.org/tools/tools_proportional_ink.html.
- 4) Brewer, Cynthia 2017. "ColorBrewer 2.0. Color Advice for A. Cartography." *http://www.ColorBrewer.org*.
- 5) Cleveland, W. S. 1979. "Robust Locally Weighted Regression and Smoothing Scatterplots." ...

Subject Code:	Subject Name: DATA VISUALIZATION	T/L/ ETL	L	T / S.Lr	P/R	С
CBCA22013	Prerequisite : Knows Digital Marketing Metrics, Social Media Metrics.	Lb	3	1	0	4
	Tutorial SLr : Supervised Learning P: Project R : Research C : Credit ory / Lab / Embedded Theory and Lab	S	•			•

# **OBJECTIVES:**

- To interpret data plots and understand core data visualization concepts such as correlation, linear relationships, and log scales.
- To explore the relationship between two continuous variables using scatter plots and line plots.
- To translate and present data and data correlations in a simple way, data analysts use a wide range of techniques — charts, diagrams, maps, etc.

# Unit I

Introduction of visual perception, visual representation of data, Gestalt principles, information overloads.

# Unit II

Creating visual representations, visualization reference model, visual mapping, visual analytics, Design of visualization applications.

# **Unit III**

Classification of visualization systems, Interaction and visualization techniques misleading, Visualization of

one, two and multi-dimensional data, text and text documents.

# **Unit IV**

Visualization of groups, trees, graphs, clusters, networks, software, Metaphorical visualization

# Unit V

Total 60 Hrs

12Hrs

# 12Hrs

# 12Hrs

12Hrs



Subject Code: CBCA22014	Subject N	ame: <b>Soft</b>	Computi	ing			Ty/Lb/E TP/IE	T / L S.Lr	P/R	C
	Prerequisi MATHE			U <b>TER KN</b>	OWDEGE	& BASIC	Ту	3 1	0	4
L : Lecture T : T					t R : Resear	rch C : Cred	its			
T/L/ETL : Theorem	ry / Lab / En	nbedded T	heory and	Lab						
<b>OBJECTIVES</b>										
$\blacktriangleright$ To learn the	key aspects	of Soft co	mputing							
To know abo				block hypo	thesis of G	enetic algor	ithm.			
To understar						U				
To study the	fuzzy logic	componer	nts							
To gain insig				and control.						
To gain know						chines.				
COURSE OUT	COMES (C	Cos)								
Students comple										
CO1	Understan	ding the So	ft Computir	ng Constitue	nts					
CO2	Getting en	riched the H	Building blo	ock hypothes	is, working J	principle and	the operato	rs		
CO3	Understan	d the Machi	ine Learning	g using Neu	ral Network,	Adaptive Ne	etworks			
CO4	1				zzy Sets and	2				
CO5	-	- -	Inference S		<b>)</b>	<b>j</b>				
Mapping of Co					Os)					
Cos/POs	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P	<b>P09</b>
CO1	3	2	3	2	3	2	2	3		2
CO2	3	3	3	1	3	3	1	3		3
CO3	3	2	2	2	2	3	2	2		3
CO4	3	3	3	1	1	3	1	1		3
CO5	2	3	3	3	2	3	3	2		3
Cos/PSOs	PS	501	P	S02	Р	S03		PS04		
CO1	3	3		3		1		2		
CO2	2	2		3		2		3		
CO3		3		2		1		3		
CO4		3		3		2		3		
CO5		2		3		3		3		
			U		on, 3 – Higł	-	-			
Category H	I&S Pr	rogram core	Program Elective	Open elective	Skill enhancing elective	Interdisciplin ary/Allied	Skill component	Practical Project/ Internship	ot	hers
								interniship		

### **REFERENCES:**

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, EijiMizutani (2003), Neuro-Fuzzy and Soft Computing, Prentice-Hall of India.

2. Kwang H.Lee(2005), First course on Fuzzy Theory and Applications, Springer-Verlag Berlin Heidelberg.

3. George J. Klir & Bo Yuan(1995), Fuzzy Sets and Fuzzy Logic-Theory and Applications, Prentice Hall. 4. James A. Freeman and David M. Skapura(2003), Neural Networks Algorithms, Applications, and Programming Techniques, Pearson Edn.

5. David E. Goldberg(2007), Genetic Algorithms in Search, Optimization and Machine Learning, Addison Wesley..

6. Mitsuo Gen & RunweiCheng(2000), Genetic Algorithms and Engineering Optimization, Wiley Publishers.

### UNIT IV FUZZY LOGIC

Fuzzy Sets - Operations on Fuzzy Sets - Fuzzy Relations - Membership Functions-Fuzzy Rules and Fuzzy Reasoning - Fuzzy

Introduction, Building block hypothesis, working principle, Basic operators and Terminologies like individual, gene, encoding, fitness function and reproduction, Genetic modeling: Significance of Genetic operators, Inheritance operator, cross over, inversion & deletion, mutation operator, Bitwise operator, GA optimization problems, JSPP (Job Shop Scheduling Problem), TSP (Travelling

UNIT II GENETIC ALGORITHMS 12 Hrs

**OBJECTIVES:** To learn the key aspects of Soft computing  $\geq$ 

Prerequisite : BASIC COMPUTER KNOWDEGE & BASIC

### $\triangleright$ To know about the components and building block hypothesis of Genetic algorithm.

L: Lecture T: Tutorial SLr: Supervised Learning P: Project R: Research C: Credits

To understand the features of neural network and its applications

MATHEMATHICS

Subject Code:

CBCA22014

- $\geq$ To study the fuzzy logic components
- $\triangleright$ To gain insight onto Neuro Fuzzy modeling and control.

T/L/ETL : Theory / Lab / Embedded Theory and Lab

 $\geq$ To gain knowledge in machine learning through Support vector machines.

Subject Name: Soft Computing

### UNIT I INTRODUCTION TO SOFT COMPUTING

12 Hrs Evolution of Computing - Soft Computing Constituents - From Conventional AI to Computational Intelligence - Machine Learning

# **Basics**

Salesman Problem), Differences & similarities between GA & other traditional methods, Applications of GA.

### **UNIT III NEURAL NETWORKS**

Machine Learning using Neural Network, Adaptive Networks - Feed Forward Networks - Supervised Learning Neural Networks -

Radial Basis Function Networks - Reinforcement Learning- Unsupervised Learning Neural Networks - Adaptive Resonance

Architectures – Advances in Neural Networks.

Inference Systems - Fuzzy Expert Systems - Fuzzy Decision Making

# **UNIT V NEURO-FUZZY MODELING**

Adaptive Neuro-Fuzzy Inference Systems - Coactive Neuro-Fuzzy Modeling - Classification and Regression Trees - Data Clustering Algorithms - Rule base Structure Identification - Neuro-Fuzzy Control - Case Studies.

### Total no. of Hrs : 60

Ty/Lb/E

TP/IE

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# 12 Hrs

12 Hrs





	Subject Code: CBCA22015			Subject	t Name	: Machi	ne Lear	ning		Ty/Lb/E TP/IE	L	T/ S.Lr	P/R	C
LitectureT:TutorialSL:SupervisedLearningP:ProjectR:ResearchC:CreditsT/L/ETL:Theory/Lab/Embe         OBJECTIVE:         > To introduce students to the basic concepts and techniques of Machine Learning.         > To study the various probability based learning techniques         > To understand graphical models of machine learning algorithms         > To understand GUI optimization for neural networks         COURSEOUTCOMES(COS): (3-5)         CO         Distinguishbetween,supervised, unsupervised and disemi-supervised learning         CO2         Apply the apt machine learning strategy for any given problem         CO3         Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem         CO4         Design systems that uses the appropriate graph models of machine learning         CO5         Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency         Modes of PO4         PO8         PO1         PO1         CO4         PO2         CO4         CO4         PO3         PO4         PO8       PO9			Preree	quisite: B		-		ge and E	Basic	Ту	3	1	0	4
<ul> <li>             To introduce students to the basic concepts and techniques of Machine Learning.         </li> <li>             To tohaveathoroughunderstandingoftheSupervisedaldUnsupervisedlearningtechniques         </li> <li>             To understand graphical models of machine learning algorithms         </li> </ul> <li>             To understand graphical models of machine learning algorithms         </li> <li>             To understand GUI optimization for neural networks         </li> <li>             COURSEOUTCOMES(COs): (3-5)         <ul> <li>             CO1             Distinguishbetween, supervised, unsupervised and semi-supervisedlearning             CO2             Apply the apt machine learning strategy for any given problem             CO3             Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem             CO4             Design systems that uses the appropriate graph models of machine learning             CO5             Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency                 Mapping of Course Outcomes with Program Outcomes (POs)                 CO3             3</li></ul></li>			Supervis	edLearni				hC:Cree	ditsT/L/	ETL:The	ory/La	ıb/Embe	.]	
<ul> <li>To have a thorough understanding of the Supervise dand Unsupervise dlearning techniques</li> <li>To study the various probability based learning techniques</li> <li>To understand GUI optimization for neural networks</li> </ul> COURSEOUTCOMES(COs): (3-5)           CO1         Distinguish between, supervised, unsupervised and semi-supervised learning           CO2         Apply the apt machine learning strategy for any given problem           CO3         Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem           CO4         Design systems that uses the appropriate graph models of machine learning           CO5         Modifyexisting machine learning algorithms to improve classification efficiency           Mapping of Course Outcomes with Program Outcomes (POS)         PO1         PO1         PO1           CO4         2         3         3         2         2         1         1         2           CO5         PO1         PO2         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO1           CO4         2         3         2         2         3         3         1         2           CO4         2         3         2         2         3         3         2         2         1         1         2         1         2         1		1	1	1					<b>N</b> 4 <b>1</b>					
<ul> <li>To study the various probability based learning techniques</li> <li>To understand graphical models of machine learning algorithms</li> <li>To understand GUI optimization for neural networks</li> </ul> COURSEOUTCOMES(COs): (3-5)           CO1         Distinguishbetween, supervised, unsupervisedandsemi-supervisedlearning           CO2         Apply the apt machine learning strategy for any given problem           CO3         Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem           CO4         Design systems that uses the appropriate graph models of machine learning           CO5         Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency           Mapping of Course Outcomes with Program Outcomes (POs)         PO1           CO3         3         2         2         2         1         1         2           CO3         3         2         2         3         3         2         2         1         1         2           CO4         Design systems that uses the appropriate graph models of machine learning         CO5         Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency         Mapping of Course Outcomes with Program Outcomes (POs)           CO3         3         2         2         3         3         2         1         2         1         2         1         2         1         2						•		•			-			
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➤ To understand GUI optimization for neural networks         COURSEOUTCOMES(COs): (3-5)         CO1       Distinguishbetween, supervised, unsupervisedandsemi-supervisedlearning         CO2       Apply the apt machine learning strategy for any given problem         CO3       Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem         CO4       Design systems that uses the appropriate graph models of machine learning         CO5       Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency         Mapping of Course Outcomes with Program Outcomes (POs)         CO3       3       2       3       3       1       2         CO3       3       2       2       1       1       2         CO5       PO1       PO2       PO3       PO4       PO5       PO6       PO7       PO8       PO9       PO10       PO11       PO1         CO1       3       3       2       2       2       1       1       2         CO3       3       2       2       3       3       2       2       1       2       1       2         CO4       2       3       2       2       3       3       3       2       1       1       2<	•		•	•		-	•		) C					
COURSEOUTCOMES(COs): (3 - 5)           CO1         Distinguishbetween, supervised, unsupervised and semi-supervised learning           CO2         Apply the apt machine learning strategy for any given problem         CO3           CO3         Suggest supervised, unsupervised or semi-supervised learning algorithms for any given problem           CO4         Design systems that uses the appropriate graph models of machine learning         CO5         Modifyexistingmachinelearningalgorithmstoimproveclassificationefficiency           Mapping of Course Outcomes with Program Outcomes (POs)         CO3         3         2         3         3         2         2         1         1         2           CO3         3         2         2         3         3         2         2         2         1         1         2           CO4         PO2         PO3         PO4         PO5         PO6         PO7         PO8         PO9         PO10         PO11         PO1           CO4         2         2         3         3         2         2         2         3         3         2         1         1         2           CO3         3         2         2         3         3         3         2		-	•					5011111	15					
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H/M/L indicates Strength of Correlation       H- High, M- Medium, L-Low         Category       H&S       Program core       Program core       Open elective       Skill enhanci iplinary/ compon Allied       Practical others         Allied       ent       Internshi p       Program elective       Program elective       Internshi elective       Internshi elective       Program ent       Program ent <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>2 1</td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td></t<>							2 1			1				
Category       H&S       Program core       Program Elective       Open elective       Skill enhanci ng elective       Interdisc Skill opinary/ compon       Practical others       others         Allied       ent       ng       Allied       ent       p       p         Interdisc       Skill       statical       others       others         Interdisc       statical       statical       others         Interdisc       statical       statical       others         Interdisc       statical       statical       statical         Interdisc       statical       statical       statical         Interdisc       statical       statical       statical       statical       statical			-			f Corre	lation	H- Hig	-	ledium. I	Low			
elective p ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	Category		Program	Program	Open	Skill	Interdisc iplinary/	Skill	Practical Project/					
								ent						
	A ppg		$\checkmark$											

# Mathematics L:LectureT:TutorialSLr:SupervisedLearningP:ProjectR:ResearchC:CreditsT/L/ETL:Theory/Lab/Embe ddedTheoryand Lab

Subject Name: Machine Learning

Prerequisite: Basic Computer Knowledge and Basic

# Unit 1

Subject Code:

CBCA22015

Introduction to Machine Learning, Examples of Machine Learning applications - Learning associations, Classification, Regression, Unsupervised Learning, Reinforcement Learning. Supervised learning- Input representation, Hypothesis class, Version space, Vapnik-Chervonenkis(VC) Dimension.

# Unit 2

Advanced machine learning topics: Bayesian modelling and Gaussian processes, randomized methods, Bayesian neural networks, approximate inference.

# Unit 3

Deep learning: regularization, convolutional neural networks, recurrent neural networks, variationalautoencoders, generative models, applications.

# Unit 4

Applications of machine learning in natural language processing: recurrent neural networks, backpropagation through time, long short term memory, attention networks, memory networks, neural Turing machines, machine translation, question answering, speech recognition, syntactic and semantic parsing, GPU optimization for neural networks.

# Unit 5

Evaluation in ML: metrics, cross-validation, statistics, addressing the multiple comparisons problem.

# Total No. of Hrs: 60

# **Reference Book:**

- 1. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. MIT Press 2012
- 2. Ian Good fellow, Yoshua Bengio and Aaron Courville. Deep Learning. MIT Press 2016.
- 3. Bayesian Reasoning and Machine Learning David Barber, Cambridge University Press, 2012.





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**TP/IE** 

### 12 Hrs

12 Hrs

# 12 Hrs

12 Hrs

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4



SubjectCode: CBCA22I03	Subject Nam	e: Mini Project	Ty/Lb/E TP/IE	L	T / S.Lr	P/R	С
	Prerequisite:	Nil	IE	0	0/0	4/0	2
L : Lectu	re T:Tutorial	SLr : Supervised Learning P : Project T/L/ETL : Theory/Lab/Embedded T			Credits		

Students will have an opportunity to expose their knowledge and talent to make an innovative project. Students are supposed to do innovative projects useful to industries/society in the area of relevant field, inter and multi-disciplinary areas, under the guidance of a staff member . They have to prepare a project report and submit to the department.

At the end of the semester Viva-Voce examination will be conducted by the internal Examiner duly appointed by the Head of the department and the students will be evaluated.



SubjectCode: CBCA22I04	Subject Nam	e: Internship	Ty/Lb/E TP/IE	L	T/ S.Lr	P/R	С
	Prerequisite:	Nil	IE	0	0/0	2/0	1
L : Lectu	Prerequisite: Nil         L : Lecture T:Tutorial         SLr : Supervised Learning P : Project I         T/L/ETL : Theory/Lab/Embedded T				Credits		

Students are supposed to undergo internship in related Industries for a minimum period of 15days cumulatively during the semester. They have to prepare a report on the Internship with a certificate in proof from competent authority in the industry. At the end of the semester Viva-Voce examination will be conducted by the Examiners duly appointed by the Head of the department and the students will be evaluated.



Subject Code:HE	BCC22004		Subject [ STRAT]			Г UP		Ту	/Lb	L	T	Р	C
			Prerequ	isite:	Nil				Ту	3	0	0	3
T/L/:The	eory/LabL	:Lectur	eT:Tuto	rialP:P	Practica	al/Proje	ctR:Re	search	C:Cred	its			
OBJECT	FIVE: .												
	stand new	venture	creation	opportu	inities, i	its resou	irces an	d requi	rements	for			
	e Start-up.												
	EOUTCO												
CO1	Deve	elop a sta	art-up En	terprise	e with E	Big Idea	Genera	tion.					
CO2	Anal	yze star	t-up capi	tal requ	iremen	t by ana	lyzing l	egal fac	ctors.				
CO3	Inter	pret feas	sibility A	nalysis	toward	s fundir	ng issue	s.					
CO4	Acce	ess grow	th stages	in new	ventur	e and re	asons f	or scalir	ig ventu	res.			
CO5	Evalu	uate fina	incial sta	bility a	nd deci	de on ex	kpansio	n possit	ilities.				
Mapping	g of Cours	e Outco	omes wit	h Prog	ram Oı	utcome	s(POs)						
COs/POs	s PO1	PO2	PO3	PO4	PO5	PO6	<b>PO7</b>	PO8	PO9	PSO1	PSC	)2	PSO3
COs/POs	<b>s PO1</b> 2	<b>PO2</b> 3	<b>PO3</b>	<b>PO4</b> 2	<b>PO5</b> 2	<b>PO6</b>	<b>PO7</b> 3	<b>PO8</b>	<b>PO9</b>	PSO1	PSC	)2	PSO3
										PSO1	PSC	)2	PSO3
CO1	2	3	3	2	2	3	3	3	3	PSO1	PSC	)2	PSO3
CO1 CO2	2 2	3 2	3	2 2	2 2	3 3	3 3 3	3 2	3 2	PSO1	PSC	)2	PSO3
CO1 CO2 CO3	2 2	3 2 2	3 3 3	2 2 2	2 2 1	3 3 3	3	3 2 3	3 2 2	PSO1	PSC	)2	PSO3
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Subject Code:HBCC22004	Subject Name: START UP STRATEGIES	Ty/Lb	L	Т	Р	C
	Prerequisite: Nil	Ту	3	0	0	3
T/L/:Theory/LabL:Le	ctureT:TutorialP:Practical/ProjectR:Res	earchC:Cred	its			

### Unit I: Start-up opportunities:

The New Industrial Revolution - The Big Idea -Generate Ideas with Brainstorming- Business Start-up - Ideation-Venture Choices - The Rise of the startup Economy- The Six Forces of Change - The Start-up Equation- The Entrepreneurial Ecosystem- Entrepreneurship in India. Government Initiatives.

### Unit II: Startup Capital Requirements and Legal Environment:

Identifying Startup capital Resources requirements- Estimating startup cash requirements- Develop financial assumptions- Constructing a Process Map- Positioning the venture in the value chain- Launch strategy to reduce risks-Startup financing metrics- The Legal Environment- Approval for New Ventures- Taxes or duties payable for new ventures.

### Unit III: Startup Financial Issues: Feasibility Analysis-

The cost and process of raising capital- Unique funding issues of a high- tech ventures – Funding with Equity-Financing with Debt- Funding Startup with bootstrapping- crowd funding- strategic alliances.

### Unit IV: Startup survival and Growth:

Stages of growth in a new venture- Growing with the market- Growth within the industry- Venture life patterns-Reasons for new venture failures- preparing for change- Leadership succession. Support for the growth and sustainability of the venture.

### Unit V: Planning for Harvest and Exit:

Dealing with Failure: Bankruptcy, Exit Strategies- Selling the Business- Cashing out but staying in being- Going Public (IPO)- Liquidation.

### **Reference Books:**

- 1. Kathleen R Allen, Launching New Ventures, An Entrepreneurial Approach, Cengage Learning 2016.
- 2. Anjan Raichaudhuri, Managing New Venture Concepts and Cases, Prentice Hall International 2010.
- 3. S. R. Bhowmika& M. Bhowmik, Entrepreneurship, New Age International, 2007.
- 4. Steven Fisher, Ja-nae Duane, The Startup Equation- A Visual Guidebook for Building your Startup, Indian Edition, Mc Graw Hill Education India Pvt. Ltd, 2016.
- 5. Donald F Kuratko, Jeffrey S. Hornsby, New Venture Management: The Entrepreneur's Road Map, 2e, Routledge,2017.
- 6. Vijay Sathe, Corporate Entrepreneurship, le, Cambridge, 2009



Subject Code: HBCC22005		Subject	t Name: <b>PR</b>	INCIPLE	ES OF DIG	ITAL MA	ARKETINO	G Ty/L b/ ETL	-	`/ .Lr	P/R	C
		Prerequ	uisite : Nil					Ту	3	0/0	0/0	3
L : Lecture T : T/L/ETL : Theo					oject R : Resear	ch C: Credits						
OBJECTIVES	S											
٠			-		ts to unders otential of l		indamental j rketing.	principles	s of D	igital	mark	etin
•							to identify vith appropr					
COURSE OU	TCO	MES (Co	os)									
Students comp												
CO1		Unders	stand the con	ncepts and	uses of Dig	ital Market	ing					
CO2		Develo	p Strategic	Planning f	for the Marke	et						
CO3		Evalua	te the Ethica	al and Lega	al Values							
CO4		Predict	the Market	ing Trends								
Mapping of C	ourse	Outcon	e with Progra	am Outcome	(POs)							
Cos/POs		PO1	PO2	PO3	PO4	PO5	PO6	P07	P	08	PO	)9
CO1		3	2	2	1	1	1	3		1	1	1
CO2		3	2	1	2	2	2	3		2	1	1
CO3		2	2	2	1	2	2	3		3	2	2
CO4		2	2	2	3	3	2	3		1	2	2
			3/2/1 Inc	licates Streng	gth Of Correlati	ion, 3 – High,	2- Medium, 1-	Low				
Category	H&S		Program core	Program Elective	Open elective	Skill enhancing elective	Interdisciplina ry/Allied	Skill component	Pro	ctical ject/ nship	oth	ers
		~										

# L : Lecture T : Tutorial S.Lr : Supervised Learning P : Project R : Research C: Credits Ty/Lb/ETL : Theory/Lab/Embedded Theory and Lab **OBJECTIVES:**

PRINCIPLES OF DIGITAL MARKETING

- This course helps the students to understand the fundamental principles of Digital marketing, • the past, present and future potential of Digital marketing.
- At the end of the course students will be able to identify the role of e-marketing in the present • context and develop an e-marketing plan with appropriate e-marketing strategies.

### **UNIT I: INTRODUCTION**

Subject Code:

HBCC22005

Digital-Marketing Past, Present & Future – Digital-Marketing Landscape, Digital-marketing's Past - Web 1.0, Digital Marketing Present - Web 2.0, Future -Web 3.0, Strategic Digital-Marketing, and Digital -Business Models - Online Revenue Models, Value Models, and Strategic Digital-Business Models.

# **UNIT II: DIGITAL MARKETING PLAN**

Process, Creating a Digital-Marketing Plan, Seven Steps -Situation Analysis, Strategic Planning, Objectives, Digital-Marketing Strategies – Product, Price, Distribution, Communication, Relationship Management; Implementation plan, Budget, Evaluation.

### **UNIT III: DIGITAL -MARKETING ENVIRONMENT**

Subject Name :

Prerequisite: Nil

Overview of Digital-Marketing Environment, Global Digital -Markets, Wireless Internet Access, Digital divide, Building inclusive Digital markets, social networking, Ethical and Legal Issues - Overview, Digital Property, Emerging issues. 9 Hrs

### **UNIT IV: DIGITAL-MARKETING MANAGEMENT**

Online offer - Creating customer value online, Product Benefits, Digital Marketing enhanced product development, Payment options, Pricing Strategies; Internet as distribution, Digital Marketing Communication - Owned Media, Paid media, Earned Media.

### **UNIT V: EMERGING TRENDS**

Emerging trends in Digital-marketing, Content Marketing, Social Media Marketing, Email Marketing, Affiliate Marketing, Video Marketing, Mobile Marketing, Interactive advertising, International Online Marketing, Search Engine Marketing, Online Partnership, Viral Marketing, E-CRM, E-Business, E-Tailing. Total Hours: 45

### **TEXT BOOK:**

1. Strauss Judy, Frost Raymond (2013), E-Marketing, 7/e; New Delhi: Prentice Hall.

### **REFERENCE BOOKS:**

- 1. Chaffey Dave and Smith PR (2013), Emarketing Excellence: Planning and Optimizing your Digital Marketing; 4/e; Routledge.
- 2. Ryan Damian, (2014), Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, 3/e; Kogan Page Limited.



# 9 Hrs

9 Hrs

9 Hrs

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HBCC22006		PROPER		HTS A	ND PA	TENT	S.				-		
	ŀ	Prerequisi	te: Nil						Ту	3	0	0	3
T/L/:Theory	/Lab	L:Lectur	eT:Tuto	rialP:P	ractica	l/Proje	ctR:Re	esearch	C:Credi	ts			
<b>DBJECTIVE</b>	· .												
Fo introduce	funda	mental as	pects of	Intellec	tual pro	perty R	ights to	studer	its who a	re going	to pla	y a m	ajor
ole in develop													
To develop ex	<b>•</b>					sues an	d sensit	ize the	learners	with the	emerg	ging is	sues in
PR and the ra	tional	e for the j	protectio	n of IPI	<b>ર</b> .								
COURSEO	UTCO	DMES(C	Os):The	studen	ts will	be able	to						
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				U U						Ū.			
CO2	é	apply the	knowled	ge of IF	PR for p	orofessi	onal dev	velopm	ent				
CO3		develop a	•	n for pro	otection	and co	mplianc	ce of In	tellectual	Propert	y Rigł	nts &	
	1	knowledg	e										
CO4							durature	of IDD	and Cam				
		create awa							and Cop	yright co	прпа	nce	
CO5	c c	deliver the	e purpose	e and fu	inction	of IPR	and pate	enting					
Mapping of	Cour	se Outco	mes witl	1 Progr	am Ou	tcomes	(POs)						
				. 9			( )						
COs/POs	PO		PO3	PO4	PO5	PO6	PO7	PO8	PO9	PSO1	PS	02	PSO3
	<b>PO</b>		<b>PO3</b>	<b>PO4</b> 2	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b> 2	PSO1	PS	02	PSO3
CO1		1 PO2								PSO1	PS	02	PSO3
CO1 CO2	3	1 PO2 3 3	2 1	2 2	2 3	3 2	3 2	2 2	2 3	PSO1	PS	02	PSO3
CO1 CO2 CO3	3 3 3	1 PO2 3 3 3	2 1 2	2 2 2	2 3 3	3 2 3	3 2 2	2 2 3	2 3 2	PSO1	PS	02	PSO3
CO1 CO2 CO3 CO4	3 3 3 3	1 PO2 3 3 3 3 3	2 1 2 2	2 2 2 3	2 3 3 2	3 2 3 2	3 2 2 2	2 2 3 1	2 3 2 2	PSO1	PS	02	PSO3
CO1 CO2 CO3 CO4 CO5	3 3 3 3 3 3	1 PO2 3 3 3 3 2	2 1 2 2 1	2 2 2 3 2	2 3 3 2 2	3 2 3 2 2	3 2 2 2 3	2 2 3	2 3 2	PSO1	PS	02	PSO3
CO1 CO2 CO3 CO4 CO5 1/2/3indicate	3 3 3 3 3 esStre	1 PO2 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 2 1 correlation	2 2 2 3 2	2 3 3 2 2	3 2 3 2 2	3 2 2 2 3	2 2 3 1	2 3 2 2	PSO1	PS		PSO3
COs/POs CO1 CO2 CO3 CO4 CO5 1/2/3indicate	3 3 3 3 3 esStre	1 PO2 3 3 3 3 2	2 1 2 1 Correlation	2 2 3 2 001-Hi	2 3 2 2 gh,2-M	3 2 3 2 2	3 2 2 3 <b>3-Low</b> Ski	2 2 3 1 2 11 2	2 3 2 2 terdisciplin	ı Skill	Pract	ical	PSO:
CO1 CO2 CO3 CO4 CO5 1/2/3indicate	3 3 3 3 3 esStre	1 PO2 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2	2 1 2 1 Correlation	2 2 3 2 0 <b>01-Hi</b>	2 3 2 2 gh,2-M	3 2 3 2 2 <b>fedium</b> ,	3 2 2 3 <b>3-Low</b> Ski enhano	2 2 3 1 2 II In cing In	2 3 2 2 2	n Skill compone	Pract	ical ect/	
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# Prerequisite: Nil T/L/:Theory/LabL:LectureT:TutorialP:Practical/ProjectR:ResearchC:Credits

### UNIT – I:

HBCC22006

Introduction to IPRs, Basic concepts and need for Intellectual Property – Meaning and practical aspects of Patents, Copyrights, Geographical Indications, IPR in India and Abroad. Nature of Intellectual Property, Industrial Property, technological Research, Inventions and Innovations – Important examples of IPR.

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(An ISO 21001 : 2018 Certifie E.V.R. High Road, Maduravoval, Cher

UNIT – II: 9Hrs Intellectual Property Rights. The IPR tool kit, Patents, the patenting process, Patent cooperation treaties: International Treaties and conventions on IPRs: Trade Related Aspects of Intellectual Property Rights Agreement, Patent Cooperation Treaty, Patent Act of India, Patent Amendment Act, Design Act, Trademark Act, Geographical Indication Act.

### UNIT – III:

Intellectual Property Protections IPR of Living Species, protecting inventions in biotechnology, protections of traditional knowledge, biopiracy and documenting traditional knowledge, Digital Innovations and Developments as Knowledge Assets – IP Laws, Cyber Law and Digital Content Protection. Case studies: The basmati rice issue, revocations of turmeric patent, revocation of neem patent. 9Hrs

### UNIT – IV:

Exercising and Enforcing of Intellectual Property Rights Rights of an IPR owner, licensing agreements, criteria for patent infringement. Case studies of patent infringement, IPR - contract, unfair competitions and control, provisions in TRIPS,

### UNIT-V:

Role of Patents in Product Development & Commercialization Recent changes in IPR laws impacting patents and copy rights, intellectual cooperation in the science and allied industry. Patentable and non-patentable research. Case studies . Text book: Total hours:45

- 1. Nithyananda, K.V. (2019). Intellectual Property Rights : Protection and Management. India, IN: Cengage Learning India Private Limited.
- 2. Neeraj, P., & Khusdeep, D. (2014). Intellectual Property Rights. India, IN: PHI learning Private Limited. **References**:

1.P.B. Ganguli, Intellectual Property Rights: Unleashing the Knowledge Economy. Tata Mc Graw Hill, 2001. Steve Smith, The Quality Revolution.1st ed., Jaico Publishing House, 2002.

2. Kompal Bansal and Praishit Bansal. Fundamentals of IPR for Engineers, 1st Edition, BS Publications, 2012.

3. Prabhuddha Ganguli. Intellectual Property Rights. 1st Edition, TMH, 2012.

4.R Radha Krishnan & S Balasubramanian. Intellectual Property Rights. 1st Edition, Excel Books, 2012.

5. M Ashok Kumar & Mohd. Iqbal Ali. Intellectual Property Rights. 2nd Edition, Serial Publications, 2011. VinodV. Scople, Managing Intellectual Property. Prentice Hall of India PvtLtd, 2012.

6.Deborah E. Bouchoux. Intellectual Property: The Law of Trademarks, Copyrights, Patents and Trade Secrets. Cengage Learning, 3rd ed. Edition, 2012.

7. Prabuddha Ganguli. Intellectual Property Rights: Unleashing the Knowledge Economy. McGraw Hill Education, 2011. Edited by Derek Bosworth and Elizabeth Webster. The Management of Intellectual Property. Edward Elgar Publishing Ltd., 2013.

8. Wadhera (2004), Intellectual Property Rights, Universal Law Publishing Co.

9.Ramappa (2010), Intellectual Property Rights Law in India, Asia Law House

### **E-resources:**

1.Subramanian, N., & Sundararaman, M. (2018). Intellectual Property Rights - An Overview. Retrieved from http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf

2. World Intellectual property Organisation. (2004). WIPO Intellectual property Handbook. Retrieved from https://www.wipo.int/edocs/pubdocs/en/intproperty/489/wipo pub 489.pdf

### **Reference Journal:**

1. Journal of Intellectual Property Rights (JIPR): NISCAIR

### **Useful Websites:**

1.Cell for IPR Promotion and Management (http://cipam.gov.in/)

2.World Intellectual Property Organisation (https://www.wipo.int/about-ip/en/)

3.Office of the Controller General of Patents, Designs & Trademarks (http://www.ipindia.nic.in/)

### Ty/Lb Subject Code: Subject Name: INTELLECTUAL

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SubjectCode: CBCA22L10	Subject Nam	e: Major Project	Ty/Lb/E TP/IE	L	T/ S.Lr	P/R	С
	Prerequisite:	Nil	Lb	0	0/0	12/0	6
L : Lectu	re T:Tutorial	SLr : Supervised Learning P : Project T/L/ETL : Theory/Lab/Embedded T			Credits		

To make the students to make use of the knowledge and skill developed during their four years of study and to apply them for making an innovative product/process for the development of society and industries.

Students are expected to do a Project work either in an Industry or at the University in the field of relevant field /inter-disciplinary /multi-disciplinary area . The work to be carried out in Phase II should be continuation of Phase I. Each student will be allotted a guide based on the area of Project work. In case of industrial Project external guide has to be allotted from Industry. Inter disciplinary/multi-disciplinary project can be done with guidance of relevant department. Monthly reviews will be conducted during the semester to monitor the progress of the project by the project review committee. Students have to submit the Project thesis at the end of the semester and appear for the Project Viva-Voce examination conducted by the examiners duly appointed by the Controller of Examination. In case of industrial project certificate in proof has to be included in the report along with the bonofide certificate.



SubjectCode: CBCA22I05	Subject Nan	e: Research Publication	Ty/Lb/E TP/IE	L	T/ S.Lr	P/R	С
	Prerequisite:	Nil	IE	0	0/0	4/0	2
L : Lectu	re T:Tutorial	SLr : Supervised Learning P : Project T/L/ETL : Theory/Lab/Embedded T			Credits		

Students are supposed to prepare and publish the article based on his/her area of research in peer reviewed referred journal. Code of research publication ethics should be followed. After publishing the article students should present a seminar in presence of department faculties and PG students. At the end of semester viva examination will be conducted by the examiners appointed by the Head of the department.