DEPARTMENT OF SOFTWARE ENGINEERING





BOS Date	22.09.2020
36 th ACM Date	10.10.2020

CURRICULUM & SYLLABUS

FOR

B.Sc.COMPUTER SCIENCE

(Based on Outcome Based Education)

Learning Outcomes based Curriculum Framework (LOCF)

(I - VI Semester)

REGULATIONS – 2020

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PERIYAR MANIAMMAI INSTITUTE OF SCIENCE AND TECHNOLOGY

Our University is committed to the following Vision, Mission and core values, which guide us in carrying out our Software Engineering Department mission and realizing our vision:

	INSTITUTION VISION
To be	a University of global dynamism with excellence in knowledge and
innova	tion ensuring social responsibility for creating an egalitarian society.
	INSTITUTION MISSION
UM1	Offering well balanced programmes with scholarly faculty and state-of-art
	facilities to impart high level of knowledge.
UM2	Providing student - centered education and foster their growth in critical
	thinking, creativity, entrepreneurship, problem solving and collaborative
	work.
UM3	Involving progressive and meaningful research with concern for
	sustainable development.
UM4	Enabling the students to acquire the skills for global competencies.
UM5	Inculcating Universal values, Self-respect, Gender equality, Dignity and
	Ethics.
	INSTITUTION CORE VALUES
•	Student – centric vocation
•	Academic excellence
•	Social Justice, equity, equality, diversity, empowerment, sustainability
•	Skills and use of technology for global competency.
•	Continual improvement
•	Leadership qualities.
•	Societal needs
•	Learning, a life – long process
•	Team work
•	Entrepreneurship for men and women
•	Rural development
•	Basic, Societal, and applied research on Energy, Environment, and
	Empowerment.

DEPARTMENT OF SOFTWARE ENGINEERING

DEPARTMENT VISION

To be a leading department in the field of software development and digital design that offers the software education with the State-of-the-art skills. The Graduates will be recognized as globally competent by their dynamic work and produce valuable digital solutions for the society.

DEPARTMENT MISSION

DM1	To construct the software related technical skills among the students.
DM2	To practice the cutting-edge technologies in the various areas of digital
	design and software development.
DM3	To contribute towards the betterment of the society by producing
	enhanced software solutions through research.
DM4	To generate the spirit of inquiry, team work, novelty and professionalism
	among the students.

Sl.No.	Name	Designation	Membership
1.	Dr.P.Aruna	Asso. Professor & Head Dept. Of Soft. Engg., PMIST	Chairperson
2.	Dr.J.Jeyachidra	Asso. Professor/CSA & Dean i/c /FCSE	Member
	Dr.Jayanthi	Professor / Dept. of Civil Engineering, PMIST.	Member
3.	Dr.A.Sasikala	Asso. Professor & HOD Dept. of Mathematics., PMIST	Member
5.	Dr.K.Kesavan	Asst. Prof. & HOD Dept. of Physics., PMIST	Member
6.	Dr.K.Selvam	Asst. Prof. & HOD Dept. of English., PMIST	Member
7.	Ms.S.Manjula	Asst. Prof. Dept. of Soft. Engg., PMIST	Member
8.	Mr.D.Maghesh Kumar	Asst. Prof. Dept. of Soft. Engg., PMIST	Member
8.	Dr.K.Mohankumar	Asst. Prof. & Research Supervisor PG Research Department of Computer Science, Rajah Serfoji Govt. College, Thanjavur	External Member Representing academia
9.	Mr.J.Roy Jose ,	Team Lead Stead Fast Technologies, Chennai	External Member Representing industry
10.	Mr.A.M.Karthick	V Year M.Sc S/W Engg Dept. of Soft. Engg., PMIST	Student

MEMBERS OF THE BOARD OF STUDIES

The current Bachelor of science (B.Sc.) Curriculum is undergoing its **First Board of studies on 22.09.2020** to tune the syllabus towards Outcome based Education and meet the Learning Outcomes based Curriculum Framework (LOCF) of UGC and in turn the suggestions provided will be implemented in Regulations 2020 – 2021.

It is thoroughly felt there is a need to change the present curriculum in order to produce software engineers who possess skills that are employable. Hence, appropriate modification in the existing curriculum will augment the manpower and skill requirement of our country. The quality of an educational system can be judged from at least three perspectives: the inputs to the system, what happens within the system and the outputs from the system. In order to refine the input to the system, BoS members redefined the curriculum with the focus towards outcome-based education and Learning Outcomes based Curriculum Framework (LOCF).

In this connection, it is felt to frame the department vision and attain the vision through a well-structured mission framed in consultation with the faculty members and other administrators of PMIST.

Department Vision and Mission Definition Process

The development of vision and mission of the department is carried out as per the following steps.

Step: I	Brainstorming carried out at different levels
	First level - Department faculty by the HOD
	Second level - Current students by the faculty
	Third level - Employers, alumni and academia and industry experts
Step: II	Benchmarking with other Universities: Understanding the Vision and
	Mission
Step: III	Validation by the Board of studies and then Academic Council
Step: IV	Wide publicity in the department and institution

The University Vision is split up into small elements and verifies its compliance with Department Vision

UNIVERSITY VISION	DEPARTMENT VISION
Global dynamism	Graduates will be recognized as globally
	competent by their dynamic work
Excellence in knowledge and	Offers the education with the State-of-the-art
innovation	skills
Ensuring social responsibility for	Produce valuable digital solutions for the
creating an egalitarian society.	society.

To accomplish the vision stated, well-structured mission is established with consultation with administrators, faculty members and other officials.

UNIVERSITY MISSION	DEPARTEMNT MISSION
Well balanced programmes with scholarly	Excellence in various areas of digital design
faculty	and software development
State-of-art facilities to impart high level of	Facilities with respect to the cutting-edge
knowledge.	technologies.
Student - centered education and foster	Generate the novelty among the students.
their growth in critical thinking, creativity,	
entrepreneurship, problem solving and	
collaborative work.	
Progressive and meaningful research with	Producing valuable software solutions
concern for sustainable development.	through research.
Enabling the students to acquire the skills	Construct the software related technical
for global competencies.	skills among the students.
Inculcating Universal values, Self-respect,	Contribute towards the betterment of the
Gender equality, Dignity and Ethics.	society and generate the spirit of inquiry,
	team work and professionalism among the
	students.

Table: 1 Mapping of University Mission (UM) and Department Mission (DM)

	DM1	DM2	DM3	DM4	Total
UM1	2	3	1	0	6
UM2	1	2	0	2	5
UM3	1	1	3	0	5
UM4	3	1	1	1	6
UM5	0	0	2	3	5

1-Low 2- Medium



PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Based on the mission of the department, the programme educational objective is formulated as

The B.Sc. Computer Science dedicated to produce graduates who have ability to

PEO1	evolve as globally proficient computer professionals by giving enriched
	performance in problem solving, analysis and synthesis for computer
	science related issues.
PEO2	exercise with contemporary tools and technologies to provide an effective
	user-friendly interface for the real time social concerns.
PEO3	communicate effectively in a multidisciplinary team and manage the team
	members through the acquired leadership skills to achieve the target in
	time.
PEO4	handle the customers and stakeholders effectively with the awareness of
	human values and ethical concerns.
PEO5	pursue lifelong learning through the cutting-edge Learning Management
	Systems and thus satisfy the up-to-date industry expectations.

PEO PROCESS ESTABLISHMENT

The faculty members of the Software Engineering department at our institution met on different occasions for discussion and a final work session to complete the steps of the process in order to draft the set of PEOs for Software Engineering Department to assess the graduates few years after graduation.



The framework for the review and revision of the PEOs at the departmental level involving all the faculty members comprised the following broad stages.

- 1. Using the key words and phrases extracted from the Mission Statement of the institution and department to identify attributes to gauge graduates.
- 2. Capturing the distinction between the educational objective and the student outcomes.
- 3. Formulating each objective to be measurable.

The program educational objectives for the software engineering program describe accomplishments that graduates are expected to attain within five years after graduation. Graduates will have applied their expertise to contemporary problem solving, be engaged professionally, and have continued to learn and adapt, and have contributed to their organizations through leadership and teamwork.

Mapping of Program Educational Objectives (PEOs) with Department Mission (DM)

B.Sc. (CS)	PEO1	PEO2	PEO3	PEO4	Total
DM1	3	2	0	0	5
DM2	2	2	1	1	6
DM3	1	2	1	1	5
DM4	0	1	3	1	5
1-	Low	2 - 1	Medium	3- H	igh

The development of vision, mission and programme educational objectives is tuned in line with the global and national standards and it is assured that the department vision and mission will facilitate in meeting the vision and mission of the University.

The Program Educational Objectives shall cover both technical and professional aspects of the expected achievement in terms of technical skills required in the profession for which the program prepares the students

- Achievements in terms of professional, ethical, and Communicational aspects required by the profession for which the program prepares the students (team work, ethical behavior, effective communication, etc.)
- Achievements in terms of management and leadership skills (project managers, directors, CTOs, CEOs, etc.)
- Achievements in terms of life-long learning through continuous education (certifications, conferences and workshops attendance, etc.)
- Achievements in terms of advanced and pursuing graduate studies (graduate studies, research careers, etc.)
- Other aspects could be considered when defining educational objectives such as the ability to engage in entrepreneurship activities

SUMMARY OF THE FEED BACK OBTAINED

Total number of feedbacks collected: 63

In that the following suggestions given by the stakeholders,

- 1. Arrange expert lectures for each semester.
- 2. Curriculum should support to enhance the English communication both orally and in writing
- 3. New programming languages may be included in the curriculum.
- 4. Students are trained for global certificate examination.
- 5. New technologies should be updated in the curriculum periodically.
- 6. Exposure to events like seminars/conferences/Workshops beyond the campus
- 7. Improving social skills

Based on the stakeholders' input and the attainment results from stakeholder survey, PEO statements and targets were revised.

PROGRAMME OUTCOME (PO)

At the time of graduation, competency of the student is measured through the attainment of programme outcomes. The quantification of programme outcomes attainment is measured through the assessment of established course outcomes for each course.

Graduates of the B.Sc. Computer Science programme will have attained the ability to

	PROGRAMME OUTCOMES
PO 1	Demonstrate the aptitude of Computer Programming and Computer based problem solving skills and Display the knowledge of appropriate theory, practices and tools for the specification, design, implementation
PO 2	Ability to learn and acquire knowledge through online courses available at different MOOC Providers and to link knowledge of Computer Science with other two chosen auxiliary disciplines of study.
PO 3	Display ethical code of conduct in usage of Internet and Cyber systems and ability to pursue higher studies of specialization and to take up technical employment.
PO 4	Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
PO 5	Ability to operate, manage, deploy, configure computer network, hardware, software operation of an organization.
PO 6	Ability to present result using different presentation tools and Ability to appreciate emerging technologies and tools.
PO 7	Ability to formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.
	PROGRAMMME SPECIFIC OUTCOME
PSO1	provide the professional user-friendly interface with the help of state-of- the-art tools and technologies.
PSO2	design the interactive& responsive web based and mobile applications.

Table : 3Mapping of Program Educational Objectives (PEOs) with Program
Outcomes (POs)

BSc CS				PS	50	Total				
D.5C. C5	1	2	3	4	5	6	7	1	2	
PEO1	1	3	2	1	1	0	0	3	1	13
PEO2	0	2	2	3	1	1	0	2	1	13
PEO3	1	1	0	1	0	3	3	1	1	12
PEO4	0	1	1	2	2	1	0	1	3	13

1 - Low 2 - Medium 3 - High

Table :4Mapping of Program Outcomes (POs) with Graduate Attributes
(GAs)

SLNo	Graduate Attributes	РО								PSO	
		1	2	3	4	5	6	7	1	2	
GA1	Subject Specialist	3							3	3	
GA2	Problem analysis	3							3	3	
GA3	Design/Development of solutions		3						3	3	
GA4	Conduct investigations of complex problems			3					3	3	
GA5	Modern tool usage				3				3	3	
GA6	Environment and Sustainability					3			1	1	
GA7	Ethics and Social Responsibility		1			2	2		1	1	
GA8	Effective Communication							3	1	1	
GA9	Individual and Team Work						3		2	2	
. GA10	Life-long learning							3	2	2	

1- Slightly

2 - Supportive

3 - Highly related

PO PROCESS ESTABILSHMENT



CURRICULUM DEVELOPMENT

The software engineering curriculum is drawn to define the role of software engineer to meet the global challenges and equip themin implementing proven techniques and procedures to provide sustainable solutions for practical problems of society. In addition to their technical competencies, students must possess engagement skills, sustained learning and adapting, leadership, teamwork with good command in the communication skills.

The faculty members have been allotted for developing the courses and its outcomes as given below. They in turn conducted frequent discussions with each other and with students in drafting the course content.

The curriculum development is ensured that students receive integrated, coherent learning experiences that contribute towards their personal, academic and professional learning and development.

Courses and topics were designed and developed within a framework which comprises a specified curriculum, specified assessment arrangements, and clearly identified educational aims and learning outcomes.

Faculty members assigned for course development

S.No	Course Name	Staff In charge
1.	Programming Methodologies	UGC
2.	Computer Fundamentals	Mr. M. Chandrakumar Peter
3.	Data Structures	UGC
4.	Digital Electronics	Ms. C. Rajanandhini
5.	Multimedia Systems	Mr. M. Chandrakumar Peter
6.	Operating System	UGC
7.	Algorithms	UGC
8.	Object Oriented Programming	UGC
9.	Data Base Management System	UGC
10.	Principles of Management	Mr. B. Mahendra Mohan
11.	MATLAB Programming	UGC
12.	Programming in Java	UGC
13.	Python Programming	UGC
14.	Computer Networks	UGC
15.	Web Technologies	Dr. P. Aruna
16.	Mobile Application Development	UGC
17.	Cloud Computing	UGC

Facultv	members	assigned	for ele	ctive co	urse dev	elopment
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S.No.	Course Name	Staff Incharge
1.	Software Engineering	UGC
2.	Computer Ethics	UGC
3.	Computer Organization & Architecture	UGC
4.	Computer Networks	UGC
5.	. Net Technologies	Dr.P.Aruna
6.	GIMP (GNU Image Manipulation Program)	UGC
7.	Theory of Computation	UGC
8.	Image Processing	UGC
9.	Internet Technologies	UGC
10.	System Security	UGC
11.	Internet of Things	UGC
12.	Data Mining	UGC
13.	Artificial Intelligence	UGC
14.	Computer Graphics	UGC
15.	Machine Learning	UGC
16.	Human Computer Interface	UGC
17.	Data Analytics	UGC

Faculty members allotted to Common subjects

S.No	Subject Name	Responsible Staff
1	Human ethics, Values, Rights and Gender equality	Dr.S.Kumaran,AP(SG) / Biotechnology
2	Algebra, Differential calculus & Analytical Geometry	Dr C.Vimala HOD/Maths
3	Disaster Management	Dr. Jayanthi HOD/Civil
4	Discrete Mathematics	Dr C.Vimala HOD/Maths
5	Fundamentals of Statistics	Dr R.Arumugam AP/Maths
6	Allied Physics	Dr. Kesavan HOD/Physics
7	Environmental Studies	Dr Gomathy HOD/Chemistry
8	Comprehensive English	Dr Selvam HOD/Eng.
9	Communication Skills in English	Dr Selvam HOD/Eng.
10	English for Effective Communication	Dr Selvam HOD/Eng.

COURSE DEVELOPMENT

The following elements were developed by the faculty members involved after interaction and discussions.



In aligning programme outcome and graduate attributes, course offered to the degree programme are finalized based on the standard template finalized by the university.

S.No	Description	Credits	%
1	Ability Enhancement Compulsory Courses (AECC)	8	5.63
2	Core Courses (CC)	72	50.70
3	Skill Enhancement Course (SEC)	16	11.27
4	Discipline Specific Elective (DSE)	36	25.35
5	Generic Elective (GE)	6	4.23
6	Minor Course	2	1.41
7	IPT	2	1.41
8	Mandatory Courses	0	0
	Total Credits	142	

Distribution of courses to be included as per UGC and NAAC

SUMMARY OF CREDITS

Category	Ι	II	III	IV	V	VI	Total
AECC	4	4					8
СС	18	18	18	18			72
SEC			4	4	4	4	16
DSE					18	18	36
GE			3	3			6
IPT					2		2
Minor Course			1	1			2
Mandatory Course	0	0					0
Total	22	22	26	26	24	22	142

PREREQUEST MAPPING



CURRICULUM for B. Sc (Computer Science) REGULATIONS - 2020

(Applicable to the students admitted from the Academic year 2020 - 2021)

I SEMESTER

Category	Course	Course Name			Cre	edits			Hours				
	Code		L	Τ	Р	SS	Total	L	Τ	Р	SS	Total	
		Basic English	2	0	0	0	2	2	0	0	2	2+2	
AECC 1	XGL101	Communication											
		Skills											
	VCI 102 A /	Ariviyal Tamil/	2	0	0	0	2	2	0	0	0	2	
AECC 2	AGLIUZA/	Comprehensive											
	AGL102D	English											
CC-1A	XBC103	Programming	3	1	1	1	6	3	1	3	1	7+1	
		Methodologies											
CC-1B	XBC104	Algebra, Calculus &	4	1	0	1	6	4	1	0	1	5+1	
		Analytical Geometry											
CC-1C	XBC105	Computer	3	1	1	1	6	3	1	3	1	7+1	
		Fundamentals											
UMAN-1	XUM106	Human Ethics,	0	0	0	0	0	2	0	0	1	2+1	
		Values, Rights, and											
		Gender Equality											
		Total	14	3	2	3	22	16	3	6	6	25+6	

II SEMESTER

Category	Course	Course Name			Cre	edits		Hours						
	Code		L	Τ	Р	SS	Total	L	Т	Р	SS	Total		
AECC 3	XGL201	Advanced English	2	0	0	0	2	2	0	0	2	2+2		
		Communication Skills												
AECC 4	XES202	Environmental Studies	2	0	0	0	2	2	0	0	1	2+1		
CC-2A	XBC203	Data Structures	3	1	1	1	6	3	1	3	1	7+1		
CC-2B	XBC204	Discrete Mathematics	3	1	0	2	6	3	1	0	2	4+2		
CC- 2C	XBC205	Digital Electronics	3	1	1	1	6	3	1	3	1	7+1		
UMAN-2	XUM206	Disaster Management	0	0	0	0	0	3	0	0	0	3		
		Total	13	3	2	4	22	16	3	6	7	25+7		

III SEMESTER

Category	Course	Course		(Crec	lits				Ho	urs	
	Code	Name	L	Т	Р	SS	Total	L	Τ	Р	SS	Total
SEC-1B	XBC301	Multimedia	3	0	1	0	4	3	0	2	0	5
		Systems										
CC- 3A	XBC302	Operating	4	1	0	1	6	4	1	0	1	5+1
		System										
CC- 3B	XBC303	Algorithms	3	1	1	1	6	3	1	3	1	7+1
CC- 3C	XBC304	Allied Physics	4	1	0	1	6	4	1	0	1	5+1
GE-1		*Open Elective	3	0	0	0	3	3	0	0	0	3
		- To be chosen										
		by student										
Minor	XBC306	R	1	0	0	0	1*	1	0	0	0	1
Course		Programming										
* Extra												
Credit												
		Total					25+					
			17+1	3	2	3	1*	17+1	3	5	3	25+3+1

IV SEMESTER

Categor	Course	Course Name			Cre	dits		Hours					
у	Code		L	Τ	Р	SS	Total	L	Т	Р	SS	Total	
SEC-2B	XBC401	Object	3	0	1	0	4	3	0	2	0	5	
		Oriented											
		Programming											
CC - 4A	XBC402	Database	3	1	1	1	6	3	1	3	1	7+1	
		Management											
		Systems											
CC - 4B	XBC403	Statistics	4	1	0	1	6	4	1	0	1	5+1	
CC - 4C	XBC404	Principles of	4	1	0	1	6	4	1	0	1	5+1	
		Management											
GE-2		*Open Elective	3	0	0	0	3	3	0	0	0	3	
		- To be chosen											
		by student											
Minor	XBC406	Angular JS	1	0	0	0	1*	1	0	0	0	1	
Course													
*Extra													
Credit													
		Total	17					17					
			+1	3	2	3	25+1*	+1	3	5	3	25+3+1	

V SEMESTER

Category	Course	Course Name		(Crec	lits				Ho	urs	
	Code		L	Т	Р	SS	Tota 1	L	Т	Р	SS	Total
SEC-3A	XBC501A	MATLAB Programming	3	0	1	0	4	3	0	2	0	5
	XBC501B	Programming in Java	3	0	1	0	4	3	0	2	0	5
	XBC501C	Python Programming	3	0	1	0	4	3	0	2	0	5
DSE-1A	XBC502A	Software Engineering	4	2	0	0	6	4	2	0	0	6
	XBC502B	Computer Ethics	4	2	0	0	6	4	2	0	0	6
	XBC502C	Computer Organization & Architecture	4	2	0	0	6	4	2	0	0	6
	XBC502D	Computer Networks	4	2	0	0	6	4	2	0	0	6
DSE-1B	XBC503A	.NET Technologies	3	2	1	0	6	3	2	3	0	8
	XBC503B	GIMP (GNU Image Manipulation Program)	3	2	1	0	6	3	2	3	0	8
	XBC503C	Theory of Computation	3	2	1	0	6	3	2	3	0	8
DSE-1C	XBC504A	Image Processing	4	2	0	0	6	4	2	0	0	6
	XBC504B	Internet Technologies	4	2	0	0	6	4	2	0	0	6
	XBC504C	System Security	4	2	0	0	6	4	2	0	0	6
	XBC505	IPT 21 Days	0	0	0	0	2	0	0	0	0	0
			14	6	2	0	24	14	6	5	0	25

VI SEMESTER

Catego	Course	Course Name		(Crea	lits				Hou	ırs	
ry	Code		L	Т	Р	SS	Tota 1	L	Τ	Р	SS	Total
SEC-4A	XBC601A	Web Technologies	3	0	1	0	4	3	0	2	0	5
	XBC601B	Mobile Application Development	3	0	1	0	4	3	0	2	0	5
	XBC601C	Cloud Computing	3	0	1	0	4	3	0	2	0	5
DSE-2A	XBC602A	Internet of Things	4	0	0	2	6	4	0	0	2	4+2
	XBC602B	Data Mining	4	0	0	2	6	4	0	0	2	4+2
	XBC602C	Artificial Intelligence	4	0	0	2	6	4	0	0	2	4+2
	XBC602D	Computer Graphics	4	0	0	2	6	4	0	0	2	4+2
DSE-2B	XBC603A	Machine Learning	4	0	0	2	6	4	0	0	2	4+2
	XBC603B	Human Computer Interface	4	0	0	2	6	4	0	0	2	4+2
	XBC603C	Data Analytics	4	0	0	2	6	4	0	0	2	4+2
DSE-2C	XBC604	Project Work	0	0	6	0	6	0	0	12	0	12
			11	0	7	4	22	11	0	14	4	25+4

XGL	101					L	Т	P	SS	С		
AGE.			BASIC ENGLISH (COMMUNICATIO	N SKILLS	2	0	0	2	2		
C	Р	Α						P 0	<u>55</u>	H 1		
2	0	0				4	U	U	2	4		
COU	JRSE	OUT	COMES:			Domai	n	I	evel			
CO1	Re	c <i>all</i> th	e basic grammar and usi	ing it in proper conte	ext	Cognitiv	/e	Rem	ember	ing		
CO2	Ex	plain	he process of listening a	and speaking		Cognitiv	/e	Unde	rstand	ing		
CO3	Ad	apt in	portant methods of read	ling		Cognitiv	/e	Cı	eating	5		
CO4	De	- monst	<i>rate</i> the basic writing sk	tills		Cognitiv	/e	Unde	rstand	ing		
SYL	LAB	US	U			U		H	OUR	S		
UNI	ТΙ	Gra	mmar									
i. Ma	i. Major basic grammatical categories ii. Notion of correctness and attitude to error 9											
corre												
UNI	UNIT II Listening and Speaking											
iii. I	iii. Importance of listening skills iv. Problems of listening to unfamiliar dialects v. 9											
Aspe	ects of	pronu	nciation and fluency in	speaking vi. Intelligi	ibility in spea	aking						
UNI	T III	Bas	cs of Reading									
vii. I	ntrodu	iction	to reading skills viii. Int	roducing different ty	pes of texts				9			
	$\frac{11}{\mathbf{T} \mathbf{IV}}$	Bas	cs of Writing									
ix Ir	ntrodu	ction t	o writing skills x Asnee	rts of cohesion and c	oherence xi	Expandi	nσ		9			
a giv	en sei	itence	without affecting the str	ructure xii. Reorgani	zing jumbled	l sentenc	es		,			
into	a cohe	erent p	aragraph xiii. Drafting d	lifferent types of lett	ers (personal	notes,						
notic	es, co	mplai	its, appreciation, convey	ying sympathies etc.))	<u> </u>						
L	ECT	JRE	TUTORIAL	PRACTICAL	SELF ST	UDY		TO	TAL			
	30		0	0	30			6	0			
Text	t boo l 1. 1 M De	ks Aceve et.al. (Ibi Ol	lo and Gower M (1999) 2015). Oxford Advance IP	Reading and Writin ed Learner's Diction	g Skills. Lo ary of Englis	ndon, Lo h (Ninth	ngm Edit	an 2. ion).	Deute New	er,		
	3.1	Eastwo	od, John (2008). Oxford	d Practice Grammar.	Oxford. OU	Р						
	4.]	Hadefi	eld, Chris and J Hadefie	eld (2008). Reading	Games. Lond	don, Lon	gmai	n 5. F	Iedge	, T		
(2005). Writing. Oxford, OUP												
	6	folly,]	David (1984). Writing T	asks: Stuidents' Boo	k. Cambridg	e, CUP						
	7.]	Klippe	and Swan (1984). Kee	p Talking. Oxford,	OUP							
	8.5	Sarasv	ati, V (2005). Organize	d Writing I. Hyderal	bad, Orient E	lackswa	n					
	9. s 10.	Wall, Walte	r and Swan (1980) . Practic	ow English Works. (Dxford. OUP							

	PO1	Р	PO	PO4	PO5	PO6	PO7	PO8	PO9	PO1	PO11	PO12	PSO1	PSO2
		02	3							0				
CO1	2	0	0	0	0	0	2	0	1	0	0	0	0	0
CO2	2	0	0	0	0	0	2	0	1	0	0	0	0	0
CO3	1	0	0	0	0	0	1	0	1	0	0	0	0	0
CO4	2	0	0	0	0	0	1	0	1	0	0	0	0	0
Total	7	0	0	0	0	0	6	0	4	0	0	0	0	0
Scale	2	0	0	0	0	0	2	0	1	0	0	0	0	0
d														
Value														
	1	0	0	0	0	0	1	0	1	0	0	0	0	0

Table 1: Mapping of Cos with POs:

1-5=1, 6-10=2, 11-15=3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

Table 2: Mapping	g of COs wit	h GAs:
------------------	--------------	--------

	GA	GA1	GA1	GA1								
	1	2	3	4	5	6	7	8	9	0	1	2
CO1	0	0	0	0	0	0	0	1	1	2	0	0
CO2	0	0	0	0	0	0	0	0	0	2	0	0
CO3	0	0	0	0	0	0	0	0	0	1	0	0
CO4	0	0	0	0	0	0	0	0	0	0	1	0
Tota l	0	0	0	0	0	0	0	1	1	5	2	0
Scal e	0	0	0	0	0	0	0	1	1	1	1	0

1-5=1, 6-10 = 2, 11-15=3

0-No Relation, 1- Low Relation, 2 – Medium Relation, 3- High Relation

Performance Indicators

PI 8: 1 High Ethical Standards

1.1.1 Practice ethical codes and standards endorsed by professional engineers.

PI 9: 1 Leadership and team work

1.1.1 Perform as an individual and as a leader in diverse teams and in multi-disciplinary scenarios.

PI 10: 1Communication Skills

1.1.1 Professional communication with the society to comprehend and formulate reports, documentation, effective delivery of presentation and responsible to clear instructions.

PI 11:1. Life-long learners:

1.1.1 Update the technical needs in a challenging world in equipping themselves to maintain their competence

L T F XGL 102 A 2 0 (C 2	
	JE102 T	r	nwptpay;jkpo				U	U	U		
C	P A					L	Т	Ρ	SS	н	
						2	0	0	0	2	
PRERE			MES		DOMAU		T		C\/E1		
After t	he complet	ion of the course, students	s will be able to		DOMAI	N		L			
CO1	Recogniz Jiwrhu;e; jkpo;nkh	e (milahsk; jEl;gq;fs;>fiyr; nrhy;yh op %yk; mwpe;Jnfhs;sy;.	fhZjy;) gy;NtWn f;fcj;jpfs; Nghd	nwptpay; ;wtw;iwj;	Cognitive		R	eme	mber		
CO2	Choose (gw;wpg;	njupTnra;jy;)tlnkhopNtu;r; goe;jkpo; ,yf;fpaq;fs; %yk;	nrhw;fs;>Gtpapay;> mwpe;Jnfhs;sy;.	epytpay;	Cognitive		Remember				
CO3 Describe(tpsf;Fjy;) njhy;fhg;gpak; %yk; mwptpay; nra;jpfisczu;jy;. Cognitive Psychomotor										ł	
CO4	Apply CO4 (gad;gLj;Jjy;)gy;NtWfy;tpj;Jiwrhu;e;jgpupTfs;>gy;NtWfy;tpj;Jiwr Cognitive hu;e;jgpupTfs; Fwpj;JnjspTngwy;. Cognitive										
CO5	Analyze(tsu;r;rpe	<pre>view in the second second</pre>									
m	yF— 1	mwptpay;jkpo; mwpKfk;								6	
mwptj gzp—n nghJth	pay;jkpo; - rhy;yhf;fcj;j idfiyr; nrhw	nghwpapay;>njhopy;El;gk; pfs; - El;gkhdNtWghLfisc ;fiscUthf;Fjy; - tlnkhopNtu;	;>kUj;Jtk;>cotpay;.j zu;e;Jnrhy;yhf;fk; r ;r;nrhw;fiskpFjpahff	jkpopy; m nra;jy; - f ; nfhz;bUj;	wptpay; - jk iyr;nrhw;fs; jiyg; gad;gLj;	(pop , - ;Jjy;.	y; E e;jp	l;gk; ankh	. gilg; iopfSf	;Gg; f;Fg;	
m	yF— 2	gpwmwptpay; Jiwfs;								6	
Gtpap capup jkpo;.	ay;>epytpa ay;>kz;zpay	y; gw;wpgoe;jkpo; ,yf; ; gw;wpambg;gilr; nra;jpfs	fpak; Fwpg;gpLk; s; - jkpo; kUj;Jtf; fy;	jfty;fs; tp - mwpt	- njhy;fh pay; jkpOf;F	g;gp jo	oak; pay;	Fv cj;jp	vpg;g ofs; -	pLk; tsu;	
m	yF— 3	gy;NtWfiyfspy; mwptpay	;							6	
nkhop ,f;fhyf;	apay; fy;tp ; fy;tpg; ngł	–fl;llf; fiyf;fy;tp–rKjhaf;fy;t Jepiy–fiy>mwptpay; - vd;g	tp—Nra;ikf;fy;tp—kz; stw;wpd; tpsf;fq;fs;.	zpay;>Gtpa	apay;>fzf;fpa	ay; I	Mfp	ait,iz	e;jfy;	tp -	
m	yF— 4	mwptpay; jkpopy; rpWfij	fspd; gq;F							6	
rpWfij nkhop	-,yf;fzk; c ngau;g;Gkv	Jthf;Fk; cj;jpfs; - rpwe;jrµ /;Wk; mwptpay; rpWfijfs;.	pWfijfs; - rpWfij ti	ffs; - ey;y	rpWfijcUthf	;fk;	- tu	iyhW	/—r%f	[:] k; -	
m	iyF—5	mwptpay; jkpopy; ehlfq;l	fspd; gq;F							6	
ehlfk; eifr;Ri	- ehlf ,yf;f tehlfq;fs; - ı	zk;> ,Utifehlfq;fs; - gbg;gj nnkr;#u; ehlfq;fs; - njhopy;	w;Fupaehlfk; - ebg :Kiwehlfq;fs;.	;gjw;Fupae	ehlfk; - rupj	;jpu	ehlfl	<;>r%	6fehlf	ik; -	
L	ECTURE	TUTORIAL	PRACTICAL	SELF S	STUDY			ГОТ	۹L		
	30	0	0	()			30			
Nkw;g	hu;itEhy;fs	;									

mwptpay; jkpo; - lhf;lu; th.nr. Foe;ijr;rhkp
 tsu; jkpo; - ,jo;fs;
 ,yf;fpatuyhW–rpWfijgw;wpaJ
 ,yf;fpatuyhW–Gjpdk;gw;wpaJ

Table 1: CO Versus PO mapping.

				РО				PSO		
B.Sc. A & M										
	1	2	3	4	5	6	7	1	2	
CO1		1								
CO2		1								
CO3		1					1			
CO4	1	2	2	1		1	2			
CO5	2	2	2	2		1	2			
Total	3	7	4	3		2	5			
Scaled Value	1	1	1	1			1			

1 - 5 -> 1 6 - 10 -> 2 11 - 15 -> 3

3-Strong Correlation, 2-Medium Correlation, 1-Low Correlation, 0-No Correlation

x	BC10	3			L	T	P 1	SS 1	C		
C	р	Δ	PROGRAMMING METHODO	LOGIES	3 T	т Т	I P	1	о Н		
2.5	1	0.5			<u> </u>	$1 \ 3 \ 1 \ 8$					
COU	RSE C	UTCC	OMES	DOMA	IN	LEVEL					
CO1	Red sin a p	cognize uple alg roblem	e the importance of developing gorithms and flow charts to solve n.	Cognitive Psychome	e otor	Rer Per	ner cept	iber tion			
CO2	Ide cou	<i>ntify</i> t upled v	he needs problem solving skills vith top down design principles.	Cognitive Psychome	e otor	Understand Perception					
CO3	Der pro iter	<i>monstr</i> ocessin cative r	<i>rate</i> the strategies of array g algorithms coupled with nethods.	Cognitive Psychome Affective	e otor	Ap Per Rec	ply cept ceive	tion			
CO4	Illı apı	<i>istrate</i> plicatio	the concept of Structures on development.	Cognitive Psychome Affective	e otor	Ap Me Res	ply char pon	nism d			
CO5	De tec	<i>velop</i> hnique hnique	and <i>Establish</i> searching and use of pointers. recursive in programming	Cognitive Psychome	e otor	Cre Ori	eate gina	ition	. 0		
UNIT	· I	INT	RODUCTION TO PROGRAMM	lING				9+3-	+9		

Introduction to Programming, Program Concept, Characteristics of Programming, Stages in Program Development, Algorithms, Notations, Design, Flowcharts, Types of Programming Methodologies, Introduction to C++ Programming - Basic Program Structure In C++, Variables and Assignments, Input and Output, Selection and Repetition Statements.

Lab:

Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code, execute and test it. Students should be given assignments on following:

a. To learn elementary techniques involving arithmetic operators and mathematical expressions, appropriate use of selection (if, switch, conditional operators) and control structures.

UNIT II FUNCTIONS

9+3+9

Top-Down Design, Predefined Functions, Programmer -defined Function, Local Variable, Function Overloading, Functions with Default Arguments, Call -By-Value and Call-By-Reference Parameters, Recursion.

Lab:

Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code, execute and test it. Students should be given assignments on following :

b. Learn how to use functions and parameter passing in functions, writing recursive programs.

	.
UNIT III	ARRAYS

9+3+9

Introduction to Arrays, Declaration and Referring Arrays, Arrays in Memory, Initializing Arrays. Arrays in Functions, Multi-Dimensional Arrays. Lab:

Write Programs to learn the use of strings and string handling operations.

1. Problems which can effectively demonstrate use of Arrays. Structures and Union.UNIT IVSTRUCTURES9+3+9

Structures - Member Accessing, Pointers to Structures, Structures and Functions, Arrays of Structures, Unions

Lab :

1. Write programs using pointers

UNIT VFILES AND SEARCHING ALGORITHMS9+3+9

Declaration and Initialization, Reading and Writing Strings, Arrays of Strings, String and Function, Strings and Structure, Standard String Library Functions. Searching Algorithms - Linear Search, Binary Search. Use of files for data input and output. merging and copy files.

Lab:

1.Write programs to use files for data input and output.

2.Write programs to implement search algorithms.

LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL	
45	15	45	15	105+15	

TEXT BOOKS

- 1. Problem Solving and Program Design in C, J. R. Hanly and E. B. Koffman, Pearson, 2015.
- 2. Programming and problem solving with C++: brief edition, N. Dale and C. Weems, Jones & Bartlett Learning, 2010.

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- 1. Brian W. Kernighan and Dennis M. Ritchie, "The C Programming Language", Pearson Education Inc. (2005).
- 2. Aho A.V. J.E. Hopcroft and J.D. Ullman., 2001. "The Design and Analysis of Computer Algorithms", Pearson Education Delhi. Second Edition.

E-REFERENCES

http://www.comptechdoc.org/basic/basictut/index.html

http://cse02-iiith.vlabs.ac.in/

http://textofvideo.nptel.iitm.ac.in/video.php?courseId=106104128

http://www.nptel.ac.in

http://www.vlab.co.in

B.Sc		PO								
CS	1	2	3	4	5	6	7	1	2	
CO1	2	2	2	2				2	1	
CO2	1			2				2		
CO3	1		2	1						
CO4	2	1	2	3				2	1	
CO5	2		1	3				2		
Total	8	3	7	11				8	2	
Scaled	2	1	2	3				2	1	
Value	4	1	4	5				~	T	

Table 1: Mapping of Cos with POs.

 $1 - 5 \rightarrow 1$, $6 - 10 \rightarrow 2$, $11 - 15 \rightarrow 3$ 0-No relation 1-Low relation 2-Medium relation 3-Strong relation

XBC104	ALCERD	ALGEBRA, CALCULUS AND					SS	C			
								6			
C P A		IICAL GEOWIETK	1		P	55	H				
				4	1	0	I	6			
FREEQUISITES Basics of Mathematics COURSE OUTCOMES DOMAIN											
	<u>OMES</u>	ES DOMAIN									
COI Evalu	te the derivatives	derivatives of given functions Cognitive						Understand			
CO2 Calcu	Understand,										
using	Remember										
CO3 Apply	Understand,										
invers	e of a matrix					Apply					
CO4 Solve problems using Binomial, exponential and Cognitive											
logarithmic series expansions.											
CO5 Calcu	ate the distance	between two poin	its and	Cogn	itive	Un	ders	stand			
explai	n section formula	e, slope form and in	tercept								
form.											
UNIT I – DIFFE	RENTIAL CALC	ULUS						12+3			
Derivative of a function - Various formulae - Product and quotient rule of differentiation											
- Differentiation	of function of fun	ction (chain rule) – 🕻	Trigonor	netric	funct	ions	– In	verse			
trigonometric functions - Exponential function - Logarithmic functions - Logarithmic											
differentiation -	ligher derivative	s – Successive differ	rentiatior	n – Lei	bnitz	theo	orem	l			
UNIT II – INTEGRAL CALCULUS 12+3											
Constant of integration – Indefinite integral – Elementary integral formulae – Methods											
of integration – I	ntegration by sub	stitution - Integratio	on by par	ts – In	tegra	tion	thro	ough			
partial fractions	 Concept of defir 	ite integral – Prope	rties of d	efinite	e integ	gral.					
UNIT III – MAT	RICES AND DE	FERMINANTS						12+3			
Definition and ty	pes of matrices –	Matrix Operation – I	Determir	nants –	Solu	tion	of sy	vstem			
of linear equatio	s by Matrix meth	nod.			0010		010)				
UNIT IV - SERI	ES							12+3			
Binomial theorem	for a rational in	dex – Exponential au	nd Logai	rithmi	- serie	- 29		1-0			
Summation of th	e above series		na 208a		court						
UNIT V - TWO-DIMENSIONAL ANALYTICAL GEOMETRY 12+3											
Cartesian coordinate system _ Introduction to polar coordinates _ Distance between two											
points - Section formulae - Area of triangle - Locus and its equations - Straight line											
Found of a straight line parallel to an avis - slope form normal form. Intercent form											
through two point _condition of concurrency of three lines											
through two poi	11 - (())) ())) ()) ()) () ()	LECTURE TUTORIAL SELESTUDY PRACTICAL TOTAL									
through two poi	TUTORIAL	SELE STUDY	PRACT	ICAL		Т		T.			
through two poi LECTURE	TUTORIAL 15	SELF STUDY	PRACT	TCAL		T(DTA 5+15	L			
through two poi LECTURE 60	TUTORIAL 15	SELF STUDY 15	PRACT 0	TCAL		T(7	DTA 5+15	L			
through two poi LECTURE 60 TEXT BOOKS	TUTORIAL 15	SELF STUDY 15	PRACT 0	TICAL		T (7	DTA 5+15	L 5 mc L			
through two poi LECTURE 60 TEXT BOOKS 1. T. K. Man	TUTORIAL 15 cavachagom Pilla	SELF STUDY 15 ay, T. Natarajan, K. S	PRACT 0	athy, A	Algeb	T(7 ra, V	DTA 5+15 Volu	L 5 meI,			
through two poi LECTURE 60 TEXT BOOKS 1. T. K. Man S.Vishvar	TUTORIAL 15 cavachagom Pilla athan Printers and	SELF STUDY 15 ny, T. Natarajan, K. S d Publishers Pvt., Lt	PRACT 0 5. Ganap td, Cheni	athy, Anai 200	Algeb	T(7 ra, V	DTA 5+15 Volu	me I ,			

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1. P.Kandasamy & K.Thilagavathi, B.Sc Mathematics for branch I – Vol I & Vol II, S.Chand& Co, 2004.

E-REFERENCES

www.nptel.ac.in

Advanced Engineering Mathematics, Prof. Pratima Panigrahi, Department of Mathematics, Indian Institute of Technology, Kharagpur.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1	3						2		
CO2	3						2		
CO3	3						2		
CO4	3						2		
CO5	3						2		
Total	15						10		
Scaled	3						2		
Value									

Mapping of COs with POs:

1-5→1, 6-10→2, 11-15→3

0 – No Relation, 1 – Low Relation, 2- Medium Relation, 3- High Relation

COU	RSE CODE	XBC105	L	Т	P	SS	C			
COU	COURSE NAME COMPUTER FUNDAMENTALS			1	1	1	6			
PRER	REQUISITES	L	Т	Р	SS	Η				
C:P:A	C:P:A 3:1:0				3	1	8			
COU	RSE OUTCO	ME	Do	main	Level					
	<i>Recognize</i> the importance of computer system,					Understand				
CO1	application a	nd practice in Libre Office (FOSS)	Psych	omotor	Origination					
	Writer.	1 Sych	omotor		/igin	20011				
	<i>Identify</i> and	<i>define</i> basic terms and concepts in	Cogni	tive	Understand					
CO2	computer has	rdware and peripheral devices and	Psych	omotor	Origination					
	Libre Office (FOSS) Impress.	1 Sych	omotor		/igina				
	<i>Establish</i> the	relationship between hardware and	Comi	tivo		Apply				
CO3	software. Arr	<i>cange</i> data and Apply formula in Libre	Deveh	omotor	C	147 Drigin	ny			
	Office (FOSS) Calc.	1 Sych	omotor	Origination					
COA	Identify the I	O devices. <i>Design</i> database using	Cogni	tive	Remembrance					
04	Libre Office (FOSS) Base.	Psych	omotor	C	Drigina	ation			
	Identify flow	chart component and <i>apply</i> in	Comi	tivo	U	Inders	stand			
CO5	program and	design a project using Libre Office	Peych	omotor	Apply					
	(FOSS).		1 Sych	omotor	Origination					
UNIT	UNIT I - INTRODUCTION 9+3+9									
Introduction - Characteristics of computer - Evolution of computer - Generation of computer										
– clas	sification of co	mputer - The Computer system -Applie	cations	of comp	uters					
Lab:										
Libre	Office Writer									
Text]	Processing									
Table	Creation									
Resu	me Creation									
Mail	Merge			,						
UNIT	<u> TII - COMPU</u>	TER ARCHITECTURE			L		9+3+9			
The C	entral proces	sing unit (CPU) – Main Memory Unit	– Interc	onnectio	on Ur	nit – (Lache –			
Com	nunication be	tween various units of a computer syste	m.							
.										
Lab:										
Libre	Office Calc									
Work	sheet Creation	n 								
Empl	Employee Pay Details									
Student Kesult Sheet										
Simple Charts										
	III - PRIMA	KY AND SECONDARY MEMORY	1	D 1	L		9+3+9			
Prima	ary memory :	viemory representation – memory hiera	rchy -	Kandom	acce	ss me	mory –			
Types of Memory – Read only memory – types of ROM – Secondary Memory – Classification										
of secondary storage devices -Magnetic tape - Magnetic disk - Optical disk - Memory stick										
- Universal serial bus – Mass storage devices										

Lab:										
Libre Office Impress										
Power Point Prepara	ation									
Create Text And Im	Create Text And Images With Effects									
Create Animation And Sound Effects										
UNIT IV - INPUT AND OUT PUT DEVICES 9+3+9										
Input devices Type	es of input dev	ices - Optical	character recognition	n – Optical Mark						
recognition - Magne	tic ink character	recognition – Ba	r code reader – Outpu	ut devices : Types						
of output - Classific	ation of output	devices - Termi	nals	51						
1	1									
Lab:										
Libre Office Access										
Importing Data Fron	n Data Base									
Creating Macro										
Result Processing										
UNIT V	COMPUTER I	PROGRAM AN	D LANGUAGES	9+3+9						
Computer Program	: Developing a	program - Alg	orithm - flow chart	- decision table -						
program testing an	d debugging- F	Program docum	entation - Programn	ning paradigms -						
Characteristics of g	ood program -	- Computer la	nguages : Evolution	of programming						
language – Classifie	cation of prog	ramming Langu	age - Generation of	f a programming						
language – features o	of a good progra	mming languag	e							
Lab:										
Libre Office Project										
Creating A Greeting	; Card									
Creating A Cover Pa	age Of A Project									
LECTURE	TUTORIAL	PRACTICAL	Self-Study	TOTAL						
45	15	45	15	105+15						
Text books										
Dorling Kindersley, 2009. Introduction to Computer Science ITL Education Solutions										
Limited fourth Edition.										
References:										
1. Roger Hunt and John Shelly, penguin Edition, 2007. Computers and common sense, (PHI)										
2. Internet for everyone, Lenon & Lenon (Lenon Tech World), 2009.										
E-References:										
3. http://www.nptel.ac.in										
4. http://www.vlab.co.in										
	.00.111									

Course	Program Outcomes										
Outcomes	1	2	3	4	5	6	7	PSO 1	PSO 2		
CO1	2	1	1	1							
CO2			1	1							
CO3	1	2	1	1	1						
CO4	1	2	1	1	1						
CO5	1	1	1	1	2	2		1			
Total	5	6	5	5	4	3		1			
Scaled Value	1	2	1	1	1	1		1			

Mapping of COs with POs

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$

0 - No relation, 1 - Low relation, 2 - Medium relation, 3 - High relation
COU	RSE CODE	XUM106		L	Τ	Р	SS	C	
COU	RSE NAME	2	0	0	1	0			
		AND GENDER EQUALIT	Y	-	•	•	-	•	
PRER	REQUISITES	-		L	T	P	SS	H	
C:P:A		1.5: 0:0.5	D '	2	0	0	1	3	
	RSE OUTCOME	5	Domain			L	evel		
CO1	relationships	rpret the numan ethics and numan	Cognitiv	ve	Rei	men	nber		
CO2	<i>Explain</i> and <i>A</i> violence against	<i>pply</i> gender issues, equality and twomen	Cognitiv	ve	Un Ap	Understanding, Applying			
CO3	<i>Classify</i> and <i>De</i> and their violation	Cognitiv Affective	ve e	An Ree	alyz ceiv:	zing ing			
CO4	<i>Classify</i> and <i>D</i> and report on v	Cognitiv	ve	Un An	ders alyz	stand: ze	ing,		
CO5	List and response brotherhood, fig man and good g	Cognitiv Affective	ve e	Rea Rea	men spor	nber, nd			
UNIT	I HUMAN	ETHICS AND VALUES	L				6+3	3	
Social and S WHO Empa UNIT Gendo empo Emplo Phule UNIT Womo Womo Marri and R	Human Ethics and values - Understanding of oneself and others- motives and needs- Social service, Social Justice, Dignity and worth, Harmony in human relationship: Family and Society, Integrity and Competence, Caring and Sharing, Honesty and Courage, WHO's holistic development - Valuing Time, Co-operation, Commitment, Sympathy and Empathy, Self-respect, Self-Confidence, character building and Personality. UNIT II GENDER EQUALITY 6+3 Gender Equality - Gender Vs Sex, Concepts, definition, Gender equity, equality, and empowerment. Status of Women in India Social, Economic, Education, Health, Employment, HDI, GDI, GEM. Contributions of Dr.B.R. Ambetkar, ThanthaiPeriyar and Phule to Women Empowerment. 6+3 Women Issues and Challenges- Female Infanticide, Female feticide, Violence against women, Domestic violence, Sexual Harassment, Trafficking, Access to education, Marriage. Remedial Measures – Acts related to women: Political Right, Property Rights, and Disclete to Education after and Deverse Bachibilities								
UNIT	TV HUMA	NRIGHTS					6+3	3	
Huma Right Econc Labor Comr Awar occup	Human Rights Movement in India – The preamble to the Constitution of India, Human Rights and Duties, Universal Declaration of Human Rights (UDHR), Civil, Political, Economic, Social and Cultural Rights, Rights against torture, Discrimination and forced Labor, Rights and protection of children and elderly. National Human Rights Commission and other statutory Commissions, Creation of Human Rights Literacy and Awareness Intellectual Property Rights (IPR). National Policy on occupational safety, occupational health and working environment.Human RightsUNIT VGOOD GOVERNANCE AND ADDRESSING SOCIAL ISSUES6+3								
Good audit, fight	Governance - De Corruption, Imp against corruptic	emocracy, People's Participation, Tr act of corruption on society, whom on and related issues, Fairness in c	ransparen to make co riminal ju	cy i orru 1stic	n go iptio ce ac	verr n co lmir	nance mpla nistra	and ints, tion,	

Government system of Redressal. Creation of People friendly environment and universal brotherhood.

LECTU	JRE	TUTORIAL	SELF STUDY	PRACTICAL	TOTAL
3	30	0	15	0	45
Textbo	ook				
1.	Aftab A,	(Ed.), Human Ri	ghts in India: Iss	sues and Challen	ges, (New Delhi: Raj
	Publicatio	ons, 2012).			
2.	Mani. V.	S., Human Right	s in India: An O	verview (New D	Pelhi: Institute for the
	World Co	ongress on Huma	n Rights <i>,</i> 1998).		
3.	Singh, B.	P. Sehgal, (ed) Hu	aman Rights in Ir	ndia: Problems ai	nd Perspectives (New
	Delhi: De	ep and Deep, 199	9).		
4.	Veerama	ni <i>,</i> K. (ed) Periyaı	on Women Righ	ıt, (Chennai: Eme	rald Publishers, 1996)
5.	Veerama	ni, K. (ed) Periya	ar Feminism, (Pe	riyarManiamma	i University, Vallam,
1	Thanjavu	r: 2010).			
Refere	nce Book	S			
1. Bajv	wa, G.S. a	and Bajwa, D.K. H	Iuman Rights in	India: Implemen	tation and Violations
(Ne	ew Delhi:	D.K. Publications	, 1996).		
2. Cha	atrath, K.	J. S., (ed.), Educat	ion for Human R	ights and Democ	racy (Shimala: Indian
Inst	titute of A	Advanced Studies,	1998).		
3. Jaga	adeesan. 1	P. Marriage and S	Social legislations	s in Tamil Nadu,	Chennai: Elachiapen
Puł	olications,	, 1990).			
4. Kai	ıshal, Rac	hna, Women and	Human Rights in	India (New Dell	ii: Kaveri Books, 2000)
E-Refe	rence				
1. http	p://planr	ningcommission.n	ic.in/aboutus/co	ommittee/wrkgr	p12/wg_occup_safet
y.p					
2. http	p://cvc.n	ic.in/welcome.ht	ml.		
3. http	ps://www	w.transparency.or	·g/		

4. https://www.hrw.org/world-report/2015/country-chapters/india

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1					2	2	1			
CO2					2	2				
CO3						2				
CO4						2	1			
CO5						3				
Total					4	11	2			
Scaled					1	2	1			
Value										

Mapping of COs with Pos

0 – No relation, 1 – Low relation, 2 – Medium relation, 3 – High relation

 $^{1 - 5 \}rightarrow 1$, $6 - 10 \rightarrow 2$, $11 - 15 \rightarrow 3$

								T	Т	р	SS	C
X	GL2	01		WANCED I	INCI			2	0	0	0	2
C	D	•	AD	VANCEDE	Sungt S	SKILLS	TUNICATION	- T	Т	D	56	
	r 0	A 05			L.				1	r 0	33	
1.3 PRF		0.5 11151	TE. N					2	U	U	Ζ	4
				MES					ЛЛЛ	INI	IEV	/FI
Ont	thas			omplation	of th	ie courso et	udante would b	$\frac{100}{100}$	n to	111		LL
COI	l l	Reca	<i>Il</i> the	basic gramm	ar and	d using it in p	proper context	Cogi	nitive	;	Remer	nberi
CO2	2	Expl	<i>ain</i> th	e process of	listen	ing and speal	cing	Cogi	nitive	;	Under ing	stand
CO3	3	Adap	t imp	ortant metho	ods of	reading		Cogi	nitive	;	Creatin	ng
CO4	1	Dem	onstra	te the basic	writin	g skills		Cogi	nitive)	Under ing	stand
UNI	UNIT I Advanced Reading											6
i. Reading texts of different genres and of varying length ii. Different strategies of comprehensi									nsion			
iii. R	iii. Reading and interpreting non-linguistic texts iv. Reading and understanding incomplete texts											
(Clo	(Cloze of varying lengths and gaps; distorted texts.)											
UNI	ΤI		Ad	vanced Wri	ting							6
v. A	nalys	ing a t	opic f	or an essay o	r a rej	oort vi. Editii	ng the drafts arrive	ed at a	nd p	repai	ring the	final
draft	t vii.	Re-di	aft a	piece of ter	xt wi	th a differen	nt perspective (M	lanipu	latio	n ex	(ercise)	viii.
Sum	mari	se a pi	ece of	prose or poe	etry ix	. Using phra	ses, idioms and pu	inctua	tion	appr	opriate	y
UNI	T II	[Pri	nciples of co	ommi	inication and	d communicative	com	peter	ıce		6
x. In	trodu	iction	to con	nmunication	– prir	ciples and p	rocess xi. Types o	f com	mun	icatio	n - vei	rbal
and	non-v	/erbal	xii. Id	entifying and	d over	coming prob	lems of communi	cation	l			
X111.	Com	munic	ative of	competence	0	• .•						
UNI ·		1.		oss Cultural	Com	munication						6
X1V.	LEC	s-cultu FURE	ral co	TUTORI	n AL	SELF	PRACTICAL		ŗ	гот	AL	
	2	20		0		30	0			6(1	
REE	FRE	NCE	3.	0		50	0			00	<u> </u>	
1) R		Steph	$\frac{1}{2}$	$\overline{)03}$ Acade	mic V	Vriting Lond	on and New Vork	Rou	tleda			
(1) D (2) D	2) Department of English Delhi University (2006) Eluency in English Part II New Delhi OUP											
3) G	3) Grellet, F (1981), Developing Reading Skills: A Practical Guide to Reading Skills. New York											
CUP	CUP											
4) H	edge.	, T. (20	005).	Writing. Lor	ndon,	OUP						
5) K	umar	, S and	l Push	p Lata (2015	5). Č	ommunicatio	n Skills. New Del	hi, Ol	JP			
6) La	azar,	G. (20	10). L	iterature and	l Lang	guage Teachi	ng. Cambridge, C	UP				
7) N	uttall	, C (19	996). 7	Feaching Rea	ading	Skills in a Fo	oreign Language.	Londo	on, N	lacm	nillan	

8) Raman, Meenakshi and Sangeeta Sharma (2011). Technical Communication: Principles and Practice. New Delhi, OUP

				T	Т	р	SS	C		
	XES202	2		0	0	0	0	0		
C	Р	А	ENVIRONMENTAL STUDIES	L	Т	Р	SS	Н		
1.5	0	0.5		2	0	0	1	3		
PREI	REQUIS	SITE :	Nil							
Cour	se Outc	comes		Domair	۱	Level				
After	the cor	npleti	on of the course, students will be able t	:0						
CO1	Descr explat	<i>ibe</i> the in anth	e significance of natural resources and propogenic impacts.	Cogniti	ve	Remember Understand				
CO2 <i>Illustrate</i> the significance of ecosystem, biodiversity and natural geo bio chemical cycles for maintaining ecological balance.										
CO3 <i>Identify</i> the facts, consequences, preventive Cognitive measures of major pollutions and <i>recognize</i> the Affective Receiving										
CO4	CO4 <i>Explain</i> the socio-economic, policy dynamics and <i>practice</i> the control measures of global issues for Cognitive sustainable development.									
CO5	the in variou techno	mpact us wel plogy f	of population and the concept of fare programs, and <i>apply</i> the modern towards environmental protection.	Cogniti	ve	Unde: Apply	rstan 7	ıd		
UNI	ГІ	INT ST	FRODUCTION TO ENVIRONMENT UDIES AND ENERGY	AL				6		
Defir and d and utiliz benef of ex probl agric resou of alt degra indiv susta	Definition, scope and importance – Need for public awareness – Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over- utilization of surface and ground water, flood, drought, conflicts over water, dams- benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – Role of an individual in conservation of natural resources – Equitable use of resources for									
UNI	ΓII	EC	OSYSTEMS AND BIODIVERSITY					6		
Conc consi Food	Concept of an ecosystem – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession – Food chains, food webs and ecological pyramids – Introduction, types, characteristic									

features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT III	ENVIRONMENTAL POLLUTION	6
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Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: flood, earthquake, cyclone and landslide.

UNIT IV	SOCIAL ISSUES AND THE ENVIRONMENT	

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 and holocaust, Wasteland reclamation – Consumerism and waste products – Environment Protection Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

UNIT V

HUMAN POPULATION AND THE ENVIRONMENT

6

6

Population growth, variation among nations – Population explosion – Family welfare programme – Environment and human health – Human rights – Value education - HIV / AIDS – Women and Child welfare programme– Role of Information Technology in Environment and human health – Case studies.

Lecture	Tutorial	Self-Study	Practical	Total
30	0	15	0	45

Text book

- 1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co, USA, 2000.
- 2. Townsend C., Harper J and Michael Begon, Essentials of Ecology, Blackwell Science, UK, 2003

Reference Books

- 1. Trivedi R.K and P.K.Goel, Introduction to Air pollution, Techno Science Publications, India, 2003.
- 2. Disaster mitigation, Preparedness, Recovery and Response, SBS Publishers & Distributors Pvt. Ltd, New Delhi, 2006.
- 3. Introduction to International disaster management, Butterworth Heinemann, 2006.

- 4. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, New Delhi, 2004.
- 5. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media, India, 2009.
- 6. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
- 7. S.K.Dhameja, Environmental Engineering and Management, S.K.Kataria and Sons, New Delhi, 2012.
- 8. Sahni, Disaster Risk Reduction in South Asia, PHI Learning, New Delhi, 2003.
- 9. Sundar, Disaster Management, Sarup & Sons, New Delhi, 2007.
- 10. G.K.Ghosh, Disaster Management, A.P.H.Publishers, New Delhi, 2006.

E-references

- 1. http://www.e-booksdirectory.com/details.php?ebook=10526
- 2. https://www.free-ebooks.net/ebook/Introduction-to-Environmental-Science
- 3. https://www.free-ebooks.net/ebook/What-is-Biodiversity
- 4. https://www.learner.org/courses/envsci/unit/unit_vis.php?unit=4
- 5. http://bookboon.com/en/pollution-prevention-and-control-ebook
- 6. http://www.e-booksdirectory.com/details.php?ebook=8557
- 7. http://www.e-booksdirectory.com/details.php?ebook=6804

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10
CO1	2						2		2	2
CO2	1						2			2
CO3	2	1	2				3		2	3
CO4	2	2	2				2			3
CO5	2				3	3				2
	9	3	4		3	3	9		4	12
Scaled value	2	1	1		1	1	2		1	3

					T	Т	р	SS	C			
x	BC2	03		ŀ	3	1	1	1	6			
	DCL	00	DATA STRUCTURES	-	0	-	-	-	U			
С	Р	Α		ŀ	L	Т	Р	SS	H			
3	1	0		Ī	3	1	3	1	7			
PRE	EREC	DUIS	TE: Computer Programming		-				<u> </u>			
Cou	rse	~ Outco	omes Do	mai	n	Lev	vel					
Afte	er the	e com	pletion of the course, students will be able to									
	1	Expla	ins the concept of data structures and with the Co	gniti	ve	Un	dor	etan	d			
CO		mple	mented; become accustomed to the description	ycho	mot	Ap	ply	,	u			
of algorithms in both functional and procedural styles												
Choose To have a knowledge of complexity of basic												
CO2 operations like insert, delete, search on these data Cognitive Remember structures												
Ability to choose a data structure to suitably model Cognitive Apply												
	í	ny da	ta used in computer applications or Set									
CO4	 	Desig nclud	n programs using various data structures Co	⁵ Cognitive Analyze								
	6	and ge	eneral search trees, heaps, graphs etc.									
	1	Abilit	y to assess efficiency tradeoffs among different									
CO		lata	structure implementations. Implement and	~~:+:		C						
	1	know	the applications of algorithms for sorting,	gniti	ve	Cre	eate					
	1	oatter	n matching etc.									
UN	IT I		INTRODUCTION					9+3-	+ 9			
Basi	C C	oncep	ts- Algorithm Specification-Introduction, Recurs	sive	algo	orith	ms	, Da	ata			
Abs	tract	ion P	erformance analysis, Linear and Non-Linear data st	truct	ures,	Sing	gly	Link	ed			
List	s-Op	eratio	ons, Concatenating, circularly linked lists-Operation	ns to	r Cir	cula	rly	link	ed			
lists	, Do	ubly l	Linked Lists- Operations. Representation of single, t	two (dime	nsio	nal	arra	ys,			
spai	se n	natrice	es-array and linked representations.									
		~~~~~	that was functions to northern the fallowing									
	e pro	ogram on of	list of elements where the size of the list elements to	o ho	incor	tod a	nd					
dole	tod	on or aro da	rest of elements where the size of the list, elements to	u be	liisei	ieu a	mu					
b) Ir	nnle	ment	the operations insertion deletion at a given position	n in f	he lie	st an	d s	earcl	h			
for	npic an el	emen	t in the list		ine m	Jt un	u b	curci				
c) T	c) To display the elements in forward / reverse order											
UN	UNIT II LINEAR DATA STRUCTURES 9+3+9											
Stac	k- (	perat	tions, Array and Linked Implementations. Applic	ation	ıs- It	nfix	to	Post	fix			
Con	vers	ion, P	Postfix Expression Evaluation, Recursion Implementa	ation	, Que	eue-	De	finiti	on			
and	Op	eratio	ns, Array and Linked Implementations, Circular (	Quei	ies -	Inse	erti	on a	nd			
Dele	etion	Oper	ations, Dequeue (Double Ended Queue).	-								
Lab		-										

1. Write a pr	ogram that demon	strates the applicat	tion of stack operat	ions (Eg: infix
expression	to postfix convers	ion)		
2. Write a pro	ogram to implement	nt queue data stru	cture and basic ope	erations on it
(Insertion,	deletion, find leng	(th) and code at lea	ist one application	using queues
	IKEE5	· · D		<u>9+3+9</u>
Penrocontations	Arrow and Links	hary tree, Proper	Binamy Tree Trees	ees, binary free
Bipary Troos Pri	and Linker	montation Hoan	Definition Insertic	n Dolotion
	Siny Queue- inipie	mentation, meap-	Deminion, insertic	n, Deletion.
Lab			<b>a</b> 1.	
1. Write a pro	ogram that uses we	ell defined function	is to Create a binary	y tree of elements
and Trave	rse a Binary tree in	preorder, inorder	and postorder.	
	GRAPHS		1 0 11	9+3+9
Graphs, Graph A	DT, Graph Repres	entations, Graph T	raversals, Searchin	g, Static
Hashing- Introdu	ction, Hash tables,	Hash functions, Ov	verflow Handling. S	Sorting Methods,
Comparison of So	orting Methods.			
Lab				
1. Write prog	gram that impleme	ents linear and bina	ary search methods	s of searching for
an elemen	t in a list.			
2. Write and	trace programs to	understand the va	rious phases of sor	ting elements
using the 1	nethods.			
a) Insertion	n Sort			
b) Quickso	ort			
c) Bubble s	sort			
UNIT V	ALGORITHM	DESIGN TECHN	IQUES	9+3+9
Search Trees- Bir	hary Search Trees,	AVL Trees- Defin	ition and Example	s. Red-Black and
Splay Trees, Con	mparison of Searc	ch Trees, Pattern	Matching, Algorit	hm- The Knuth-
Morris-Pratt Algo	orithm, Tries (exan	nples).		
Lab				
1. Write and	trace programs to	Create a Binary sea	arch tree and insert	t and delete from
the tree.				
2. Represent	suitably a graph d	ata structure and c	lemonstrate operat	ions of
traversals	on it.			
LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
45	15	45	15	105+15
<b>REFERENCES:</b>				
1. Fundamentals	s of Data structure	s in C, 2nd Edition	n, E. Horowitz, S.	Sahni and Susan
Anderson-Fre	ed, Universities Pr	ess.		
2. Data structure	es and Algorithm A	Analysis in C, 2nd o	edition, M. A. Weis	ss, Pearson
3. Lipschutz: Scl	naum's outline seri	es Data structures	Tata McGraw-Hill	
1. www.tuto	rialspoint.com			
2. www.npte	el.com			
3. www.virtu	allab.ac.in	1		
4. Lecture	Slides, Multip	ble Choice (	Questions, Anii	mations Link:

http://highered.mheducation.com/sites/0072967757/student_view0/index.html 5. Lecture Slides : http://www.mhhe.com/engcs/compsci/forouzan/

COU	<b>JRSE CODE</b>	XBC	204	L	Т	Р	SS	C				
COU	JRSE NAME	DISCRETE MA	ATHEMATICS	3	1	0	2	6				
PRI	EREQUISTE	N	IL	L	Т	Р	SS	Н				
	C:P:A	3:0	):0	3	1	0	2	6				
Course	e Outcome			Domai	n	Le	vel					
				•								
CO1	<i>Define</i> the pr functions and ven Diagram	operties and laws of s d <i>Apply</i> the operation	sets, relations and n of the sets using	Cognit	ive	R,	Ар					
CO2	<i>Apply</i> the co forms. <i>Expla</i> Contradictio	ncepts of logic and t <i>in</i> the tautologies and n.	o find the normal d	Cognit	ive	U,	Ар					
CO3	CO3Apply the counting principle permutation and combination and to solve the problem. Explain the pigeonhole principle.CognitiveU, Ap											
CO4	CO4 <i>Explain</i> the types of lattices and to <i>show</i> lattices as Cognitive U, Ap partially ordered sets.											
CO5	CO5 <i>Apply</i> the properties of semi groups and groups <b>Cognitive</b> U, Ap and Explain any set with binary operation as a semigroup and group with examples.											
UNIT	I	<u> </u>				1	12					
set the Equiva Classif <b>UNIT</b> Statem	ory – D Morg lence classes. ication of func II ents - Normal	gan's law. Relations: Functions: Definition tion.	Properties of relation – Domain – Ra	tions – ' inge and	Type 1 typ	s of es c	relati f fun 12 radict	ons – ction-				
		TI 11	1 0		n		12	1				
Counti Combi	ng principles nations – Corr	- The Pigeonhole binatorial arguments	r = Countable and t	inting – incount	able s	mut sets.	ations	s and				
UNIT	IV						12					
Lattice	s as partially c	ordered set – Types of	f lattices – Lattices a	as algeb	raic s	yste	m.					
UNIT	V						12					
Binary	Binary operations – Semi groups - Groups – Examples and elementary properties.											
LEC	CTURE	TUTORIAL	PRACTICAL	SELF STUD	Y		TO	ΓAL				
	45	15	0	3	0		60 -	+ 30				
TEXT	BOOK											
<b>1.</b> I	Ralph. P. Gri ntroduction" <i>.</i>	maldi, "Discrete an Fourth Edition, Pears	d Combinatorial	Mathen Delhi	natics 2002.	s: A	n Ap	oplied				

**2.** Kenneth Levasseur and Alan Doerr, "Applied Discrete Structures, Department of Mathematical Sciences, University of Massachusetts Lowell, Version 2.0, 2013.

### REFERENCES

- 1. Kenneth H.Rosen, "Discrete Mathematics and its Application", Fifth edition, Tata McGraw-Hill Publishing company pvt. Ltd., New Delhi, 2003.
- 2. Dr. M.K.Venkataraman, Dr.N.Sridharan N.Chandrasekaran, "Discrete Mathematics", the National Publishing Company, 2003.
- 3. Veerajan T., Discrete Mathematics with Graph Theory and Combinatorics", 10th edition, Tata McGraw Hill Companies, 2010.

### **E REFERENCES**

- 1. www.nptel.ac.in
- 2. Graph Theory A NPTEL Course S.A. Choudum.
- **3.** Graph Theory by Prof. L. Sunil Chandran Computer Science and Automation Indian Institute of Science, Bangalore.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	1				1		1
CO2	3	1	1			1		1
CO3	3		1			1		1
CO4	3					1	1	1
CO5	3					1	1	1

#### Mapping of CO's with PO's:

3-Strong Correlation, 2-Medium Correlation, 1-Low Correlation, 0-No Correlation

				L	Т	Р	SS	С		
x	BC2	205		3	1	1	1	6		
			DIGITAL ELECTRONICS							
C	Р	Α		L	Т	Р	SS	Η		
2.5	0.5	0.5		3	1	3	1	8		
PRE	REQ	JUISI								
<u>Cou</u>	rse (	Outcon	nes I lation of the course students will be able to	Joma	In	Level				
After the completion of the course, students will be able to										
CO1		system differe	s and perform number conversions between ht number systems.	ognitiv	ve	Un	dersta	nd		
CO2	2 1 2	Demon algebra tion, and Ka	stratethe operation of logic gates, Booleanincluding algebraic manipulation/simplificaCoapplicationofDeMorgan'stheoremsrnaugh map reduction method.or	ognitiv ychor	ve not	Un Ap	dersta ply	nd		
CO3	3	Identif	<i>y, Analyze</i> and <i>Design</i> combinational circuits Or	ognitiv ychor	ve not	Un Ap	Jnderstand Apply			
CO4		Analyz flip-flo	<i>e</i> and <i>Design</i> sequential digital circuits like Ps or or	ognitiv ychor	ve not	Un Ap	Understand Apply			
CO5	5 1 1	Explain 3085mi Unders progra	<i>t</i> the architecture of the Intel croprocessor for its various applications and <i>tand</i> 8085 instruction set and develop simple Commes and practice.	ognitiv	ve	Un	dersta	nd		
τ	JNI	ГΙ	NUMBER SYSTEMS AND MINIMIZATION TECHNIQUES				9+3+9	9		
Bina Bina Exce Gate Imp Lab	nary, Octal, Decimal, Hexadecimal-Number base conversions – complements – signed nary numbers. Binary Arithmetic- Binary codes: Weighted –BCD – 2421 - Gray code- ccess 3 code-ASCII –Error detecting code – conversion from one code to another- Logic ates : AND, OR, NOT, NAND, NOR, Exclusive – OR and Exclusive – NOR- plementations of Logic Functions using gates, NAND –NOR implementations. <b>ab :</b> Logic gates – verification									
U	NIT	II	<b>BOOLEAN ALGEBRA &amp; SIMPLIFICATION</b>				9+3+9	9		
Bool Stan Imp	lean Idar Iem	Algeb d Form entatio	ra – Basic Theorems and properties – Boolean Fu s – Karnaugh Map Simplification – Two, ThreeVari n – Don't Care Conditions.	nctior ables	ns – – N4	Can ANI	onical ) and I	and NOR		
Lab	:Ap	oplicati	on of Boolean functions							
U	NIT III COMBINATIONAL CIRCUITS 9+3+9									

Combinational Circuits - Adder - Subtractor - Design and Analysis procedures - Binary Parallel Adder - Decimal Adder - Encoder - Decoder - Multiplexer - Demultiplexer -Magnitude comparators – Read Only Memory (ROM) – Programmable Logic Array(PLA).

Lab : Applications of combinational circuits.

#### UNIT IV SEQUENTIAL CIRCUIT

9+3+9

Sequential circuits - Latches - Flip-flops - Triggering of Flip-Flops - Analysis of clocked sequential circuits - State reduction and state assignment - Design procedure of clocked sequential circuits - Design of counters - Registers - Shift registers - Ripple counter and Synchronous counter.

Lab: Design and verify the circuits of Flip Flops, Registers and counters.

9+3+9

UNIT V **MEMORIES** Classification of memories -RAM organization - Write operation -Read operation -Memory cycle - Timing wave forms - Memory decoding - memory expansion - Static RAM Cell-Bipolar RAM cell - MOSFET RAM cell - Dynamic RAM cell - ROM organization -PROM -EPROM -EEPROM -EAPROM -Programmable Logic Devices.

Lab :Verification of timing waveforms.

LECTURE	TUTORIAL	PRACTICAL	SELF- STUDY	TOTAL
45	15	45	15	105+15

# **TEXT BOOK**

- 1. M. Morris Mano, "Digital Design", 3rd Edition, Prentice Hall of India Pvt. Ltd., New Delhi, 2003/Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.
- 2. John .M Yarbrough, "Digital Logic Applications and Design", Thomson-Vikas publishing house, New Delhi, 2002.
- 3. Microprocessor Architecture Programming and Application, Ganonker, Ramesh, PHI Learning, New Delhi.

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- 1. Salivahanan and S. Arivazhagan, "Digital Circuits and Design", 2nd Edition, Vikas Publishing House Pvt. Ltd New Delhi, 2004
- 2. Charles H.Roth. "Fundamentals of Logic Design", Thomson Publication Company, 2003.
- 3. Donald P.Leach and Albert Paul Malvino, "Digital Principles and applications", 5th Edition., Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.

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- 1. www.tutorialspoint.com/computer_logical_organization/pdf/quick_guide.pdf
- 2. www.vlab.co.in/ba_labs_all.php?id=1
- 3. www.nptel.ac.in/video.php?subjectId=117105080
- 4. https://www.youtube.com/watch?v=CeD2L6KbtV

R Sa				РО				PSO	
D.5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

							L	Т	Р	SS	C
3	XUM206						0	0	0	0	0
			DISA	STER MANAGEM	ENT				1		
С	Р	А					L	Т	Р	SS	Η
2.75	0	0.25					3	0	0	0	3
PREREC	QUISTE: 2	XES202									
Course	Outcome	s				Don	nain		Leve	1	
CO1	Underst	and and	d Recognize	the concepts of disas	ster	Cog	nitiv	re	Und Rem	erstar embe	nd r
CO2Recognize and describe the causes and effects of disasterCognitiveUnderstand Remember									nd r		
CO3	Describe	e the va	rious approa	ches of risk reduction	on	Cog	nitiv	'e	Rem	embe	r
CO4	<i>Demons</i> disaster	<i>trate</i> th and de	e inter-relat velopment	ionship between		Cog	nitiv	'e	Und	erstar	nd
CO5	Discuss and resr	hazard oond to	and vulnera drills related	bility profile of Indi 1 to relief	a	Cog Affe	nitiv ctive	'e e	Rem Resp	embe onse	r
UNIT -	I I	NTROI	DUCTION T	<b>O DISASTERS</b>				<u> </u>	1		6
Concep	ts and de	finition	s- Disaster, I	Hazard, Vulnerabilit	y, Res	silien	ce, R	isks			
UNIT -	II D	DISAST	ERS: CLAS	SIFICATION, CAU	SES,	IMP	ACT	S			12
Differer	ntial impa	cts- in t	terms of cast	e, class, gender, age,	, locat	ion, c	lisal	oility	Glob	al tre	nds
in disas	ters, urba	n disas	ters, panden	nics, complex emerg	encies	s, Clii	nate	cha	nge		
UNIT -	III A	PPRO	ACHES TO	DISASTER RISK R	EDU	CTIC	)N				10
Disaster	cycle -	its an	alysis, Phas	ses, Culture of safe	ety, p	oreve	ntio	n, m	nitiga	tion	and
prepare	dness co	mmuni	ity based D	RR, Structural- nor	nstruc	ctural	me	easur	es, r	oles	and
respons	ibilities	of- co	mmunity,	Panchayati Raj In	stituti	ions/	Urb	an	Local	Boo	dies
(PRIs/U	JLBs), sta	tes, Cer	ntre, and oth	er stake-holders.							
UNIT -	IV II	NTER-I	RELATION	SHIP BETWEEN DI	ISAS	ΓERS	AN	D			6
Factors	L affecting	Vulner	JPMEN I abilitios diff	arantial impacts imp	pact of	f Dov	alan	mon	t proj	octe e	uch
as dame	anecting Sembank	ments	changes in ]	Land-use etc. Climat	te Cha	ange	Ada	ntati	ion R	eleva	ince
of india	enous kn	owledg	e appropria	te technology and lo	ocal re	nige Sollr	res	Puu			ince
UNIT -	V L	DISAST	ER RISK M	ANAGEMENT IN	INDL	A	ceb				11
Hazard	and Vul	nerabili	ity profile of	India Components	s of D	isaste	er Ro	elief:	Wat	er. Fo	<u></u>
Sanitati	on, Shelte	er, Hea	lth, Waste M	Aanagement Institu	tional	arra	ngei	ment	ts (M	itigat	ion,
Response and Preparedness, DM Act and Policy, Other related policies, plans,											
programmes and legislation).											
The pro	ject / fiel	ldwork	to understa	nd vulnerabilities w	vork o	n rec	lucti	on c	of disa	aster	risk
and bui	ld a cultu	ral safe	ety.								
LEC	TURE	TU	TORIAL	PRACTICAL	SEI	F-ST	UD	Y	T	OTA	L
	45		0	0		0			45	;	
TEXT B	OOKS:										
1. (	Coppola	P Dar	mon, "Intro	duction to Interr	nation	al D	Disas	ter	Mana	agem	ent,
E	Butterworth-Heinemann, 2015										

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- 2. K. N. Shastri, "Disaster Management in India", Pinnacle Technology, 2012
- 3. Gupta Anil K, Sreeja S. Nair, "Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi, 2011
- 4. Lee Allyn Davis, "Natural Disasters", Infobase Publishing, 2010
- 5. Andharia J, "Vulnerability in Disaster Discourse", JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008

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- 1. Alexander David, Introduction in 'Confronting Catastrophe', Oxford University Press, 2000
- 2. Carter, Nick 1991. Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila Philippines.

# **E- RESOURCES:**

- 1. NIDM Publications at http://nidm.gov.in- Official Website of National Institute of Disaster Management (NIDM), Ministry of Home Affairs,
- 2. http://cwc.gov.in , http://ekdrm.net , http://www.emdat.be ,
- 3. http://www.nws.noaa.gov , http://pubs.usgs.gov , http://nidm.gov.ini
- 4. http://www.imd.gov.in

	Mapping of CO with GA											
COs	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA1	GA11	GA12
CO1	1					3	2	1				1
CO2	1					3	2	1				1
CO3	1					3	2	1				1
CO4	1					3	2	1				1
CO5	1					3	2	1				1
Total	5					15	10	5				5
Scaled value	1					3	2	1				1

V		01			L	Т	Р	S S	C
X	BC3	501			3	0	1	0	4
			MULTIMEDIA SYSTEMS					5	
C	Р	Α			L	Т	Р	S	H
3	1	0			3	0	2	0	5
PR	ERE	QUIS	SITE: XBC103	1					
Cou	irse	Outc	comes	Domain	L	evel			
Afte	er tr	ne con	npletion of the course, students will be able to		1				
со	1	<i>Ident</i> vario	bus html tags, Image editing open source	Cognitive	U	nde	erst	and	
software tools									
	Cognitive	U	Inde	erst	and				
CO2 (text) and animation and practice in HTML. Psychomot or									
CO	3	Gain	a working knowledge and <i>develop</i> their skills in	Cognitive	U	Inde	erst	and	
	5	editi	ng and altering photographs.		A	ppl	icat	ion	
		Stud	ents can renovate the damaged photos. And	Cognitive	U	Inde	erst	and	
CO	4	expo	rt the files with various formats and printing	Psychomot	A	nal	yze		
		devid	ces.	or	S	et			
		Stude	ents can <i>draw</i> and <i>develop</i> short clips and		Understand				
CO	_	bann	ers with animation using flash and create Audio	Cognitive		nae	erst	and	
	5	mes.	Using num image eating and 2D animation	Psychomot	Create				
		in inf	ternet	01	5	el			
UN		·	MULTIMEDIA SYSTEMS DESIGN		9+6				
Int	odı	iction	– Multimedia applications and its impact – Mul	timedia Syste	m	Arcl	nite	ctu	re
-Ne	etwo	ork a	rchitecture for multimedia. Evolving technolog	ies for Multi	me	edia	-H	DTV	V-
UD	TV-	3D te	echnologies and digital signal processing. Defir	, ning objects f	or	Mu	ltin	ned	ia
syst	tem	s-Text	t-image – Audio and Video, Audio-recording	0,					
Lab	Ex	perim	ents Using Image Editing Tools						
UN	UNIT II IMAGE EDITING -BASICS 9+6								
Intr	Introduction about Image Editor- Navigating - Menus and panels-Working with Images-								<b>S-</b>
Zoc	Zooming & Panning an Image-Working with Multiple Images, Rulers, Guides & Grids-								
Uno	doir	ig Ste	ps with History- Adjusting Color with the New	Adjustments I	ar	lel-1	he	Ne	w
	SKS I	ranel	- The New Note 1001 & the Save for Web & Device	ces Interface-	i ne	2 INC	W I	Auto	)-
Ima		x Aut	derstanding Pixels & Resolution The Image C	izo Common	ig ( d t	st C	rop	pin atic	¹ 8
Opt	iges	- UII s-Roei	izing for Print & Web-Cropping & Straightening	an Image_ Ad	1115	ting	pu Ca	anc	лц ас
Size	، ج& د	Canv	as Rotation	un mage- Mu	jus	, in le	, <i>C</i>		40
	u								
Lab	Ex	perim	ents Using Image Editing Tools						
UN	IT I	II	IMAGE AND TEXT EDITING-LAYERS					9-	-6

Layers -Background Layer- Creating, Selecting, Linking & Deleting Layers- Locking & Merging

Layers-Copying Layers, Using Perspective & Layer Styles- Filling & Grouping Layers-Introduction to Blending Modes-Blending Modes, Opacity & Fill Creating & Modifying Text

Lab Experiments Using Image Editing Tools								
UNIT IV	IMAGE AND TEXT EDITING- EFFECTS	9+6						
Photo Retou	<b>Iching -</b> The Red Eye Tool-The Clone Stamp Tool- The Patch Too	l & the Healing						
Brush Tool-	Color Correction: -Adjusting Levels-Adjust Curves-Creating S	pecial Effects-						

Brush Tool-**Color Correction**: -Adjusting Levels-Adjust Curves-**Creating Special Effects**-Getting Started with Filters-Creating Text Effects- Applying Gradients to Text-**Exporting**-Saving with Different File Formats-Saving for Web & Devices-Printing Options

### Lab Experiments Using Image Editing Tools

UNIT V 2D ANIMATION

9+6

Exploring the 2D environment – working with images - basic drawing and selection – shapes –

color – text – layers – scene and frame label – symbol and instance – animation

# Lab Experiments Using 2D Animation Tools

LECTURE	TUTORIAL	PRACTICAL	SELF- STUDY	TOTAL	-
45	-	30		75	

### **TEXT BOOK**

1.Prabat K Andleigh and KiranThakrar, "Multimedia Systems and Design", PHI Resent, 2003.

2.R.Lavanya, HTML 5, Ane Books Pvt. Ltd, 2011"

3. JudithJeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.

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1.Adobe Photoshop CS 2 - One on One (2005 edition) by Deke McClelland Macromedia Flash MX 2004: The Complete Reference by Brian Underdahl

2.Foley, Vandam, Feiner, Huges, 2003. "Computer Graphics: Principles & Practice", Pearson

Education, second edition.

3. PhotoShopCS for digital photographers by Colin Smith Publisher: Charles River Media. 1st edition.

4. ActionScript for Flash MX: The Definitive Guide, 2nd Edition By Colin Moock. **E-REFERENCES** 

1. https://www.youtube.com/watch?v=ZGXS5HoBYAQ

2. https://www.youtube.com/watch?v=spoJ7Z8LzW8

3. www.tutorialspoint.com/listtutorials/multimedia/1

4. http://www.vlab.co.in

R Sa CS		PO							50
D.3CC3	1	2	3	4	5	6	7	1	2
CO1	2	2	2	2	2	1	1	2	2
CO2	2	3	2	1	1	1	1	2	2
CO3	2	2	3	1	2	1	1	3	2
CO4	2	3	1	1	1	1	1	2	2
CO5	2	1	1	2	2	1	1	2	2
Average	2	2	2	1	2	1	1	2	2

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

3-Strong Correlation, 2-Medium Correlation, 1-Low Correlation, 0-No Correlation

	DCana			L	Т	Р	SS	С	
X	BC302			4	1	0	1	6	
С	P     A     OPERATING STSTEMS       0     0		OPERATING SYSTEMS	L	Т	Р	SS	Η	
4	0	0		4	1	0	1	6	
PRERI	EQUIS	ITE	Computer Fundamentals						
Course	e Outco	omes	Dom	ain	Lev	/el			
After t	he com								
CO1	<i>Ident</i> the road and a	<i>ifying</i> ble of c lgoritl	the important computer system resources and operating system in their management policies nms.	Cogn	itive	Rei	Remember		
CO2	Abilit Calcu	ty to e ilate so	xplain the process scheduling algorithms and heduling problems	Cogn	itive	Un Ap	Understand Apply		
CO3	Abilit	ty to <i>e</i> :	xpress various process synchronization issues.	Cogn	itive	Un Ap	Understand Apply		
CO4	Indica impo	ate tl rtance	ne memory management techniques and of file system.	Cogn	itive	Un	Understand		
CO5	<i>Classi</i> vario	<i>fy</i> fu us typ	nctionality and have sound knowledge of es of operating system android.	Cogn	itive	Un	dersta	and	
UNIT	I II	NTRO	DUCTION TO OPERATING SYSTEM				1	2+3	
What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.									
UNIT	II P	ROCE	SS CHARACTERIZATION				1	2+3	
Process Process Thread	Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread, Libraries: Process Scheduling, Non Procemptive, and Procemptive Scheduling								

UNIT III INTER PROCESS COMMUNICATION AND 12+3

Algorithms.

Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery. Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter-process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IVMEMORY MANAGEMENT12+3Physical and Virtual Address Space; Memory Allocation Strategies-Fixed and -Variable<br/>Partitions, Paging, Segmentation, Virtual Memory. (File and I/O Management, OS security)DirectoryStructure, File Operations, File Allocation Methods, Device Management, Pipes,<br/>Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal<br/>Access Authorization.

UNIT V INTRO	DUCTION TO AN	<b>IDROID OPER</b> A	ATING SYSTEM	12+3			
Introduction to An	ndroid Operating S	ystem, Android	Development Fra	mework, Android			
Application Archit	ecture, Android Pro	cess Managemer	nt and File System,	Small Application			
Development using	g Android Developn	nent Framework					
				r			
LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL			
60	15	0	15	75			
Text book							
1. A Silberscha	ıtz, P.B. Galvin, G. G	Gagne, Operating	Systems Concepts	s, 8th Edition, John			
Wiley Public	cations 2008.						
2. A.S. Tanenk	oaum, Modern Oper	ating Systems, 3	rd Edition, Pearsor	n Education 2007.			
3. G. Nutt, Op	erating Systems: A I	Modern Perspect	tive, 2nd Edition Pe	earson Education			
,1997.							
4. W. Stallings	s, Operating Systems	s, Internals & De	sign Principles 200	8 5th Edition,			
Prentice Hal	l of India.						
5. M. Milenko	vic, Operating Syste	ems- Concepts ar	nd design, Tata Mc	Graw Hill 1992			
E-References							
1. NPTEL Evic	lence, 2009. IISc Bang	galore. [Online] A	vailable at:				
2. http://npte	l.ac.in/courses/Web	ocoursecontents/	'IIScBANG/Opera	ting%20Systems/			
New_index1	l.html						
3. http://npte	l.iitg.ernet.in/Comp	_Sci_Engg/IISc%	%20Bangalore/Ope	erating%20System			
s htm							

# CO Versus PO mapping.

R Sa CS				PO				PSO	
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	3	2	1						2
CO2	2	1	2	2			2		2
CO3	2	2	1				2		3
CO4	2	2	1						
CO5	2	1				1			1
Total	11	8	5	2		1	2		8
Scaled Value	3	2	1	1		1	1		2

0-No relation 1- Low relation 2- Medium relation 3- Highly relation

							_	0		
					L	Т	Р	S S	С	
X	BC3	303			3	1	1	1	6	
	-		ALGORITHMS							
C	Р	Α			L	Т	Р	S S	Н	
2.8	1	0.2			3	1	3	1	7	
PRE	REG	QUISI	<b>TE:</b> XBC105							
			COURSE OUTCOMES	Domain		L	evel			
Afte	r th	e comp	pletion of the course, students will be able	e to	1					
CO	L	<i>Recog</i> algori	<i>mize</i> to learn good principles of thm design.	Cognitive Psychomotor	Ren Per	men cep	nber tion			
		Identi	<i>fy</i> and <i>Achieve</i> to learn how to analyses	Comitivo	Un	dore	tan	1		
CO2 algorithms and estimate their worst -case and Psychomotor Set										
average- case behavior (in easy cases);										
	Illustrate and practice to become familiar Cognitive Apply									
CO	CO3 with fundamental data structures and with Psychomotor Guided									
		the m	anner in which these data structures can		Res	spor	ise			
	best be implemented;									
	<b>CO4</b> theoretical knowledge in practice (via the Psychomotor Mechanism									
CO4 theoretical knowledge in practice (via the Psychomotor Mechanism										
-	practical component of the course).									
CO	5	Devel	op and Maintain Advanced Analysis	Cognitive	Cre		ata (	<b>-</b>	~~L	
TINT	ד ידיי	Techn	ITRODUCTION	Psychomotor	C0:	mpi	ete (	) ) ) )		
UNI			Recip Design and Analysis Techniques of	Algorithman Co			2	<b>)</b> +:	)+9	
	)uu 	1	assic Design and Analysis Techniques of	Algoriums, Co.	rrect	ness I Co	5 01 nau	0.14		
Dun	ami	c Prog	ramming Croady Algorithms	Iniques, Divide			nqu	er,		
Lah	ann	c i iog	ranning, Greedy Algorithms.							
1	V	Vrite a	test program to implement Divide and C	onquer Strategy	7 Εσ	· Oı	iick	sor	۰t	
-	. , а	lgorith	im for sorting list of integers in ascending	order	•	· 2·	licit		•	
2	2. V	Vrite a	program to implement Merge sort algori	thm for sorting	a lis	t of i	integ	ger	s	
	iı	n ascer	nding order.	0			C	)		
			0							
UN	[T I]	[ <b>S</b> (	DRTING AND SEARCHING TECHNIQ	UES			Ģ	9+3	3+9	
Elen	nent	ary S	orting techniques- Bubble Sort, Inserti	on Sort, Merge	e So	rt, /	Adva	ano	ced	
Sort	ing	techni	ques- Heap Sort, Quick Sort, Sorting in	Linear Time - E	Buck	et S	ort, İ	Ra	dix	
Sort	an	d Cou	nt Sort, Searching Techniques- Median	s & Order Stat	istic	s, co	omp	lex	ity	
anal	ysis	•								
Lab	)				_					
1	. V	Vrite p	rogram to implement the DFS and BFS al	lgorithm for a gi	aph	•				
2	2. V	Vrite p	rogram to implement backtracking algor	ithm for solving	pro	blen	ns li	ke	N-	
<b>T</b> TN TI	<u>q</u>	ueens.						<u></u>	<u>, , , , , , , , , , , , , , , , , , , </u>	
UN			thma: Cranh Algorithma, Dreadth Eire C	Coard Douth T:	MOL C	007	h ar	<b>7+3</b>	) <b>+</b> 9	
Gra]	lice	rigori	Minimum Spanning Troos String Process	earch, Depth FI	151 3	earc	n ar	iu 1	us	
App   I ah	inca	uons, l	minimum opanimig rices. Sung ricess	Juig						
Luv										

1. Write a program to implement the backtracking algorithm for the sum of subsets problem.

2. Write program to implement greedy algorithm for job sequencing with deadlines.UNIT IVLOWER BOUNDING TECHNIQUES9+3+9

Lower Bounding Techniques: Decision Trees, Balanced Trees, Red-Black Trees Lab

- 1. Write a program to implement Dijkstra's algorithm for the Single source shortest path problem.
- 2. Write a program that implements Prim's algorithm to generate minimum cost spanning tree.
- 3. Write a program that implements Kruskal's algorithm to generate minimum cost spanning tree

9+3+9

UNIT V ADVANCED ANALISIS IECHNIQUE
------------------------------------

Advanced Analysis Technique: Randomized Algorithm, Distributed Algorithm, Heuristics.

Lab

- 1. Write program to implement Dynamic Programming algorithm for the 0/1 Knapsack problem.
- **2.** Write program to implement Dynamic Programming algorithm for the Optimal Binary Search Tree Problem.

LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL
45	15	45	15	105+15

**TEXT BOOKS:** 

- 1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3rd Edition 2009.
- 2. Sara basse & A.V. Gelder Computer Algorithm Introduction to Design and Analysis, Publisher Pearson 3rd Edition 1999

### **REFERENCES:**

- 1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education, 2007.
- 2. Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Galgotia Publications Pvt. Ltd., 2002
- 3. A.V. Aho, J.E. Hopcroft and J.D. Ullman "Data Structures and Algorithms" Pearson Education Delhi, 2002

# **E-REFERENCES:**

- 1. www.tutorialspoint.com
- 2. www.nptel.com
- 3. www.virtuallab.ac.inLecture Slides,
- 4. Multiple Choice Questions, Animations Link: http://highered.mheducation.com/sites/0072967757/student_view0/index.html
- 5. Lecture Slides : http://www.mhhe.com/engcs/compsci/forouzan/

R Sa CS				PO				PSO		
D.50 C5	1	2	3	4	5	6	7	1	2	
CO1	3				1					
CO2	2	3								
CO3	1	3	3	2	2					
CO4	1	3	3	2	2	3	2			
CO5		3	3	3	2	3	2	2	3	
Total	7	12	9	7	7	6	4	2	3	
Scaled	2	3	2	2	2	2	1	1	1	
Value										

# Mapping of COs with Pos

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

x	BC30	4			L 4	<b>T</b>	<b>P</b>	<b>SS</b>	C 6
	DCOU	-	ALLIED PHYSICS		-	*	Ū	*	
С	Р	Α			L	Т	Р	SS	Η
3	1	0			4	1	0	1	5
PRE	REQ	UISI	<b>TE:</b> Students with fundamental physics know	vledge in HSC	Cor	SSL	C le	vel.	
On t	he su	Icces	sful completion of the course, students will be	e able to					
Cou	rse O	utco	me	Domain			Le	evel	
CO1	Sta las	<i>ate</i> tl ser sy urce	ne basics of laser and <i>distinguish</i> the various rstems and <i>identify</i> various optical fiber and and detector.	Cognitive		Kno Ana	wle lyze	dge,	
CO2Recall the semiconductor fundamentals and Explain characterization and applications.CognitiveKnowledge, Comprehension							;e, .on		
CO3 <i>Know</i> the basics of operational amplifier and <i>Construct</i> various oscillators <i>Explain</i> various applicationsCognitive, PsychomotorK A							wle lysis	dge, s, Set	
CO4Understand the digital and gate principles distinguish Boolean algebra from algebra.Cognitive						Kno	wle	dge	
CO5 <i>Know</i> the basics of IC's <i>understand</i> the fabrication methods of IC'sCognitivePerception, Knowledge									
UNI	T - I	:	LASER PHYSICS					12	+3
Prin Type	ciples es -N	s of l d-Ya	aser- population inversion - meta stable sta g - CO2 laser - Helium - neon laser - applica	ate – conditions of laser	ons s.	for 1	aser	actio	ns -
UNI	T - II	:	FIBER OPTICS PHYSICS					12	+3
Prin	ciple	and	propagation of light in optical fibers – Numeri	ical Aperture	and	d acc	epta	nce a	ngle
– Ty com	pes muni	of oj catio	ptical fibers – Source & detector – LED ser n system – Applications.	nsor – Block	dia	gran	n fil	oer oj	ptics
UNI	T - II	I:	SEMICONDUCTOR PHYSICS					12	+3
Semiconductor fundamentals – Properties – Types of semiconductor– Volt – Ampere Characteristics of P-N junction Diode – Zener diode – applications of Zener diodes - Volt – Ampere Characteristics of common emitter NPN transistor, FET, UJT and SCR – Principles of LED and LCD.									
UNI	T - IV	V:	OPERATIONAL AMPLIFIER					12	+3
Ope subt and	ration racto Twin	nal a r, int -T os	amplifier characteristics – inverting and egrator and differentiator circuits – Wien bridg scillators	non-invertin ge oscillator –	g a Pha	ampl ase sl	ifier nift (	- ac oscilla	lder, itors

UNIT	T - V:     INTEGRATED ELECTRONICS     12+3									
Basic monolithic ICs – Steps in fabrication of Monolithic IC's – epitaxial growth – masking – etching impurity diffusion fabricating monolithic resistors, diodes, transistors and capacitors – circuit layout – contacts and inter connections– General applications of IC's										
L	ECTURE		TUTORIAL	SELF - STUDY	PRACTICAL	TO	ΓAL			
	60		15	15	0	75+	+15			
TEXT BOOKS:										
1.	1. V.K. Mehta, Principles of Electronics, S.Chand and CompanyLtd., 2009.									
2.	2. Laser Physics – Thiagarajan, Springer									
3.	3. Digital principles and Applications – Malvino & Leech, McGraw Hill Publication 7 th edition, 2011.									
REFERENCE BOOKS:										
1.	Basic El	ectro	nics – B.L. Theraja, S	Chand & company	y Ltd, New Delh	ii.				
2.	Fundan	nenta	ls of digital computer	rs – Bartee, McGra	w-Hill.					
3.	A. Mott	ershe	ed, Semiconductor De	evices and Applica	itions, New Age	Int Pub,				

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

R Sa		PO							
D.5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

							т	T	D	66	
		_					L	1	P	55	C
	XBC30	)7					1	0	0	0	1
			R P	ROGRAMMING				T			
C	Р	Α					L	Т	Р	SS	Η
0.5	0.4	0.1					1	0	0	0	1
PRE	REQU	JISITE	: Nil								
001											
COL	JKSE	ourc	OMES:								
			COURSE OUTCO	OMES		DOM	[AI]	N	Ι	LEVE	L
Afte	r the c	omple	tion of the course,	students will be ab	ole to						
CO1	Red	cognize	the significance of	f R		Cognit	ive		Re	mem	ber
		0	0			Psycho	mot	or	Per	rcepti	ion
$CO^2$	Fri	iress th	e knowledge on ev	vents and function	s of R	1090110			IIn	derst	an
		1035 11	ie knowledge on e	vents and ranction	5 01 K	Cognit	ive		1	uci 3	un
CO	Em	nlar 1	o undorstandine -	f the P and Fatal-1	ich an				u		
COS		pioy if		their own and a		Cognit	ive		Ap	ply	
	app		n programme on	their own and ac		Psycho	mot	or	Set		
	par	ticipat	e in the teams	for designing va	arious	Affecti	ve		Re	spon	đ
	pro	jects								I	
Intro	oducti	on - H	istory - Features -	• Setting up path •	- Work	king wit	h R	- Ba	asic	Synta	ix -
Vari	able a	and Da	ata Types - Opera	ator - Conditiona	1 State	ments -	Lo	opir	ng -	Con	trol
State	ement	s - Ob	ject - Functions -	Strings- Vector-Lis	sts-arra	ays-Pack	age	s- D	)ata	fram	es-
Data	base-	Visuali	zation								
Lab	:										
Obta	ining	user d	ata								
Usin	g con	ditiona	ls								
Usin	o g Ran	dom n	umbers								
Usin	σ Iter	ation									
Usin	o Vec	tor-I is	ts_arravs								
Usin	ig vee or Fun	ctions	to allayo								
	CTU		TUTODIAI		CELI		v	то		r	
L.		KE		INACIICAL	JELI 0	F-510D	1	10	1 E	L	
	15		0	0	0				15		
IEX	I RO	OKS:		1.5.6				1.	-		
1	. Hai	nds-On	Programming wit	th R, Garrett Grole	mund,	O'Reilly	y Me	edia,	, Inc	, 2014	±.
REF	EREN	CES:									
1	. Ma	stering	Predictive Analyt	ics with R, Rui Mig	guel Fo	orte, 2015	5 Pao	ckt I	Publ	lishin	g.
F-RI	FFRF	INCES	•								
1	h+++	$\frac{1}{100}$	• www.tutorialenoint	com/r/index htm							
		);; / / W	www.tutoriaispoint	$\frac{1}{1}$	u National						
	. ntt	)5://W	ww.statinethods.n	iet/r-tutorial/inde	ex.ntm						
3	. nttp	os://w	ww.guru99.com/1	-tutorial.html							
4	. http	os://w	ww.edureka.co/b	log/r-tutorial/							

XI	L 3	<b>T</b> 0	<b>P</b> 1	<b>SS</b> 0	C 4				
			<b>OBJECT ORIENTED PROGRAMMING</b>						
С	Р	Α		L	Т	Р	SS	Η	
2.5	1	0.5		3	0	2	0	5	
PRER	REQ	UISIT	E: Problem Solving Using C				-	1	
Cours	se C	outcon	es Do	mair	1		Leve	el 👘	
After	the	comp	etion of the course, students will be able to			D		1	
CO1	K	ecogni	ze the concepts of data, abstraction and Cogn	tive		Ke:	mem	iber	
	e	ncapsu	lation. Psycr	omo	tor	Pei	cept	:10n	
CO2	CO2Memorize the knowledge of classes and objects, packages and write the programs using them.Cognitive AffectiveOfficerstand d Receive								
CO3	D	evelop	the solution to the Complex problems. Cogn	itive		An	alyz	e	
CO4Implement good programming design methods for program development using exception and basic event handling mechanisms.Cognitive Affective									
<b>CO5</b> <i>Recognize</i> the typical object-oriented constructs of specific object-oriented programming language. Cognitive Psychomotor									
UNIT	Ī		NTRODUCTION					9+6	
<ul> <li>Basics: Introduction to Object Oriented Programming and its Basic Features, Basic Components of C++, Characteristics of Object-Oriented Language, Structure of a C++ Program, Flow Control Statements in C++, Functions - Scope of Variables, Inline Functions, Recursive Functions, Pointers to Functions, C++ Pointers, Arrays, Dynamic Memory Allocation and De-Allocation.</li> <li>Lab:</li> <li>1. Number of vowels and number of characters in a string.</li> <li>2. Write a function called zeros maller () that is passed with two introduce arguments by reference and</li> </ul>									
set the	sma	aller of	he number to zero. Write a man () program to access this fur	ction					
UNIT	II		DBJECT ORIENTED AND PROCEDURE ORIENTED PROGRAMMING					9+6	
Differ Overv Define Opera	Differences Between Object Oriented and Procedure Oriented Programming, Abstraction, Overview of Object-Oriented Programming Principles, Encapsulation, C++ Classes, Objects, User Defined Types, Constructors and Destructors, this Pointer, Friend Functions, Data Abstraction, Operator Overloading, Type Conversion.								
Lab: 3.Dem 4 Usi	10NS ng th	tration	of array of object.						
UNIT			NHERITANCE					9+6	
Class Static Virtua	Inhe and 1 Fu	eritance Dynan nctions	Base and Derived Classes, Virtual Base Class, Virtual Fu ic Bindings, Base and Derived Class Virtual Functions, Dy , Pure Virtual Functions, Abstract Classes, Virtual Destru	nctior nami ctors.	ns, Po c Bir	olym Idinş	orph g thro	ism, ough	
Lab:									

5.Demonstration of virtual function.

6. Demonstration of static function

UNIT IV FILE STREAMS

Stream Classes Hierarchy, Stream I/O, File Streams, Overloading the Extraction and Insertion Operators, Error Handling during File Operations, Formatted I/O.

9+6

Lab:

7. Accessing a particular record in a student's file.

8. Demonstration of operator overloading.

UNIT V	EXCEPTION HANDLING	9+6

Exception Handling- Benefits of Exception Handling, Throwing an Exception, the Try Block, Catching an Exception, Exception Objects, Exception Specifications, Rethrowing an Exception, Uncaught Exceptions.

9. Write a program to create a database for students that contains Name, Enrolment no,

Department, Programme using Constructors, destructors, input and output functions ; input and output for 10 people using different methods.

10. Create a class holding information of the salaries of all the family members (husband, wife, son, daughter). Using friend functions give the total salary of the family.

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
45	0	30	0	75

#### **TEXT BOOKS**

- 1. Problem solving with C++: The Object of Programming, Walter Savitch, 4th Edition, Pearson Education.
- 2. C++: The Complete Reference, Herbert Schildt, 4th Edition

### REFERENCES

- 1. Object Oriented Programming with C++, Sourav Sahay, 2nd Edition, Oxford
- 2. The C++ Programming Language, B. Stroutstrup, 3rd Edition, Pearson Education
- 3. Programming in C++, Ashok N Kamthane. Pearson 2nd Edition

### **E-REFERENCE**

- 1. https://www.**tutorials**point.com/cplusplus/
- 2. www.cprogramming.com/tutorial/c++-tutorial.html

### Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

P Sa CS				PSO					
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	2	1	1	1	1	2	1	1	1
CO2	3	2	2	2	2	2	2	2	1
CO3	2	2	2	2	3	2	2	2	1
CO4	3	2	2	2	2	2	2	3	1
CO5	3	3	3	3	3	3	3	3	1
Average	3	2	2	2	2	2	2	2	1

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

					т	T	n	0					
M					L	1	P	5 S	С				
XE	3C402			3									
			DATA BASE MANAGEMENT SYSTE	Μ									
С	Р	Α		L	Т	Р	S S	Н					
3	1	0			3	1	3	1	8				
PRERI	EREQUISITE: Computer Fundamentals												
Course	e Outo	Domain		Lev	vel								
After t	he cor	nplet	ion of the course, students will be able to										
CO1	<b>Reco</b> Man	e and <i>Express</i> the fundamentals of Data Base nent System and Relational database system	Cognitive	ç	Remember Understand			er nd					
CO2	Reco and	ogniz Stora	e and <i>Explain</i> the Transaction Management ge implementation techniques	Cognitive	Ç	Remember Understand			er nd				
CO3	<i>Sket</i> real	<i>ch an</i> time	ad show the Relational data base design for the application.	Cognitive Psychomory or	e ot	Apply Set							
CO4	Ana	lyze i	and Apply proper Relational data base queries	Cognitive	5	Analyze Apply							
CO5	<b>Dest</b> form	<i>ign ar</i> 1 desi	<i>ud Construct</i> an application with suitable gn and data base	Psychom or	ot	Origination		m					
UNIT	I		INTRODUCTION			9+3	3+9						
<u>р · г</u>	× 1	0		( D . 1		-							

Basic Database Concepts, Terminology, and Architecture; Types of Database Management Systems. Differences between Relational and other Database Models. Data Modelling: Relations, Schemas, Constraints, Queries, and Updates; Conceptual vs. Physical Modeling; Entity Types, attributes, ER Diagrams.

# Lab:

# 1: E-R Model

Analyze the organization and identify the entities, attributes and relationships in it. . Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

# 2: Concept design with E-R Model

Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any).

UNIT II	RELATIONAL DATABASES	9+3+9									
SQL Data Definiti	SQL Data Definition: Specifying Tables, Data Types, Constraints; Simple SELECT, INSERT,										
UPDATE, DELET	E Statements; Complex SELECT Queries, including Joins and	Nested									
Queries; Actions a	and Triggers; Views; Altering Schemas. Relational Algebra: D	efinition of									
Algebra; Relation	s as Sets; Operations: SELECT, PROJECT, JOIN, etc. Normaliz	zation									
Theory and Funct	ional Dependencies, 2NF, 3NF, BCNF, 4NF, 5NF.										
Lab:											

# 3: Relational Model

Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion.

# 4: Normalization

Apply the First, Second and Third Normalization levels on the database designed for the organization

UNIT III	DATABASE DESIGN	9+3+9

Indexing: Files, Blocks, and Records, Hashing; RAID; Replication; Single-Level and Multi-Level Indexes; B-Trees and B+-Trees. Query Processing Translation of SQL into Query Plans; Basics of Transactions, Concurrency and Recovery.

# Lab:

# 5: Installation of Mysql and practicing DDL commands

Installation of MySql. Creating databases, how to create tables, altering the database, dropping tables and databases if not required. Try truncate, rename commands etc.

6: Practicing DML commands on the Database created for the example organization

DML commands are used to for managing data within schema objects. Some examples:

- SELECT retrieve data from a database
- INSERT insert data into a table
- UPDATE updates existing data within a table
- DELETE deletes all records from a table, the space for the records remain

# UNIT IV TRANSACTION MANAGEMENT

9+3+9

DATABASE PROGRAMMING: Embedded SQL; Dynamic SQL, JDBC; Avoiding Injection Attacks; Stored Procedures; Lightweight Data Access Layers for Python and JavaScript Applications; PHP and MySQL, Object Relational Modeling: Hibernate for Java, Active Record for Rails.

# Lab:

# 7: Querying

practice queries (along with sub queries) involving ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

# 8 and 9: Querying (continued...)

Practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

UNIT V	IMPLEMENTATION TECHNIQUES	9+3+9									
BIG DATA: Motiv	vations; OLAP vs. OLTP; Batch Processing; MapReduce and H	Hadoop;									
Spark; Other Systems: HBase. Working with POSTGRES, REDIS, MONGO, and NEO:											
Setting up the san	Setting up the same Database on Four Platforms; Basic Queries and Reporting.										
Lab:											
10: Triggers											

Work on Triggers. Creation of, insert trigger, delete trigger, update trigger. Practice<br/>triggers using the above databaseLECTURETUTORIALPRACTICALSELF-STUDYTOTAL45154515105+15REFERENCES:

- 1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, 2011"Database System Concepts", Sixth Edition, Tata McGraw Hill.
- 2. Ramez Elmasri, Shamkant B. Navathe., 2008. "Fundamentals of Database Systems", Fifth Edition, Pearson.
- 3. Raghu Ramakrishnan., 2010. "Database Management Systems", Fourth Edition, Tata McGraw Hill.
- 4. G.K.Gupta, 2011."Database Management Systems", Tata McGraw Hill.

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc CS	PO							PS	0
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	0	1	2	0	1	0	0	3	3
CO2	0	1	1	1	0	0	0	1	1
CO3	1	3	1	1	1	0	0	3	3
CO4	1	3	2	1	1	1	1	3	3
CO5	3	3	2	2	1	1	1	3	2
Average	1	2	2	1	1	0	0	3	2

3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

					L	Т	Р	S S	C
	XBC403		STATISTICS		4	1	0	1	6
	D			-	т	T	р	c	
C	P	A		_	L	1	P	S	н
3.0	0.5	0.5			4	1	0	1	6
PRERE		E: SOM	E BASIC KNOWLEDGE OF STA	TISTICS IS	RE	QUI	REI	)	
COUR	SE OUI	COMES	:	Domain		Ιev	പ		
CO1:	Explain	the stat	istical data in the form of table.	Cognitive		Api	olvii	ησ	
	diagran	n and gra	aph.				<i>-</i> - <i>j</i>	6	
CO2:	Find th	ne meas	ures of central tendency and	Cognitive		Apj	olyiı	ng	
	measur	es of dis	spersion and skewness for the	Understan	l				
CO3	given a	lata.	Cognitive		Un	lore	tand	lin	
000.	Pearson	n's and f	ind the regression line for the	Coginave		σA	nnly	zing	, 1111 F
	given d	lata.				0	<b>F F -</b> J	/C	,
CO4:	Solve t	he probl	em in the time series using the	Cognitive		App	olyiı	ng	
	method	l of sea	sonal variation and find the						
	interpo	lation u	sing Newtons and Lagranges	Psychomo	ot	Imi	tatic	n	
COE	methoc	1		or Constitutes		Dau		1	
CO5:	relative	ne indez	ost of living index number	Cognitive		An	nem alvii	beri	ing
	method	l. Define	the sampling technique and			np	91 y 11	цġ	
	Apply	the conce	ept of test of significance for t, f	Affective		Rec	eivi	ng	
	and chi	-square.						U	
UNIT I	I IN I	FRODU	CTION					12	2+3
Introdu	action -	Classific	ation and tabulation of statistic	al data - D	iag	gram	mat	ic a	ind
graphic	cal repre	sentatior	n of data.						
UNIT I	I ME	EASURE	S OF CENTRAL TENDENCY					12	2+3
Measu	es of Ce	ntral ten	dency - Mean, Median and Mode	- Dispersion	n, F	Rang	e, O	uar	tile
deviati	on, Mea	n Deviati	ion, Standard Deviation - Measur	res of Skew:	nes	55.	~	•	
UNITI		RRELA	TION					12	2+3
Correla	tion - K	arl Pears	on's co-efficient of correlation - S	Spearman's	Ra	nk (	Corr	elat	ion
regress	ion lines	and Co-	efficient.						
UNIT I	V TIN	ME SERI	ES ANALYSIS					12	2+3
Time s	eries Ar	nalysis -	Trend - Seasonal variations - I	nterpolation	n -	Ne	wtoi	ns a	ind
Lagran	ges metl	hod of es	timation.	*					
UNIT	V INI	DEX NU	MBERS					12	2+3

Index numbers - aggregative and relative index - chain and fixed indeed wholesale index - Cost of living index - Sampling Techniques - types of sample and sampling procedure - tests of significance - Normal, t, F, chi -square - Simple Problems.

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
60	15	0	15	75+15

TEXT

1. Statistical methods - S.P. Gupta - S. Chand & Co., New Delhi.

### REFERENCES

1. The Fundamentals of Statistics - Elhance. Elhance publication.

2. Business Mathematics and Statistics - Dr. P. R. Vittal - Margham Publications, Chennai.

### E REFERENCES

www.nptel.ac.in

Advanced Engineering Mathematics by Prof. Somesh Kumar

Department of Mathematics, Indian Institute of Technology, Kharagpur.

### TABLE 1: COs VS GAs Mapping

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10
CO 1	3	2		1	1				1	
CO 2	3	2		1					1	
CO 3	3	2		1					1	0
CO 4	3	2		1	1				1	0
CO 5	3	2		1	1				1	0
	15	10	0	5	3	0	0	0	0	5

1 - Low , 2 - Medium , 3- high

					L	Т	Р	S S	C	
	BC404	L	PRINCIPLES OF MANAGEMENT		4	1	0	1	6	
С	Р	Α			L	Т	Р	S S	н	
3	0.5	0.5			4	1	0	1	6	
PRER	EQUI	SITE	Basic principles in an organization.							
Cours	se Out	come	<b>S</b>	Domain		L	eve	1		
After	the co	mplet	tion of the course, students will be able to			-				
CO1	Reco	ognizo	e the significance of Management Principle.	Cognitive Psychom r	e oto	Re Pe	eme erce	emb eptic	er on	
CO2	Cognitive	2	U d	nde	ersta	in				
CO3	9	Apply Respond								
CO4	CO4 <i>Utilize</i> the directing effectively in the real-world class Cognitive room management.									
CO5	Dest conc	<i>ign</i> ar cept in	nd <i>Establish</i> the principles of management n day to day activities.	Cognitive Psychom r	e oto	Create Set				
UNIT	Ί	0	VERVIEW OF MANAGEMENT				12	2+3		
Defin: Orgar Globa	ition - nizatio Il Scen	Mar n anc ario.	agement - Role of managers - Evolution l the environmental factors – Trends and Cha	of Manage allenges of	eme Ma	ent inag	Tho gem	ougl ent	nt- in	
UNIT	' II	P	LANNING				12	2+3		
Natur by ob decisi under	e and jective on - D differ	purpo (MB) ecisic rent co	ose of planning - Planning process - Types of p O) Strategies - Types of strategies - Policies - on Making Process - Rational Decision-Makin onditions.	olans –Obje Decision I g Process -	ectiv Mal - De	ves - king ecisi	- Ma g - T .on	anag Jype Mal	ging 28 0 king	
UNIT	' III	0	RGANIZING				12	2+3		
Natur organ Centr Recru Appra	e and ization alizati itmen aisal.	purpo n - l on ar t - Ori	ose of organizing - Organization structure - Fo Line and Staff authority - Departmentat ad Decentralization - Delegation of authority entation - Career Development - Career stage	ormal and ion - Spa 7 - Staffing 8 – Trainin	info in g - S g	orm of Selee Per	al g con ctio forı	rou trol n a nar	ps - nd ice	
UNIT	ĪV	DI	RECTING				12	2+3		
Creati Leade	ivity a ership nunica	and I Style	nnovation - Motivation and Satisfaction - es - Leadership theories - Communication Organization Culture - Elements and type	Motivatio - Barrier s of cultur	on ' s to e -	The The o ef Ma	orie fect	es - tive		
					-			00		

cultural diversity.

UNIT V	CC	ONTROLLING				12+3					
Process of co	ontr	olling - Types of	f control - Budge	etary and non-buo	dgeta	ry control					
techniques - Managing Productivity - Cost Control - Purchase Control - Maintenance											
Control - Quality Control - Planning operations.											
LECTURE TUTORIAL PRACTICAL SELF STUDY TOTAL											
60         15          15         75+15											
REFERENCE	S:										
1. Stephen P.	. Ro	bbins and Mary C	Coulter, 'Manageme	ent', Prentice Hall o	of Inc	lia,8th					
edition.		-	_								
2. Charles W	LΗ	lill, Steven L McSł	nane, 'Principles of	Management', Mc	graw	[,] Hill					
Education, Sp	vecia	al Indian Edition, 2	2007.	U U	0						
3. Hellriegel,	Slo	cum & Jackson, ' N	/lanagement - A C	ompetency Based A	Appr	oach',					
Thomson Sou	th V	Vestern, 10th editi	ion, 2007.	1 2							
4. https://w	ww	.pearsonhighered	.com								

5. www.miracleworx.com

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B.Sc CS	РО								50
	1	2	3	4	5	6	7	1	2
CO1	0	0	1	1	0	0	0	2	2
CO2	0	1	0	1	0	1	1	2	2
CO3	0	2	2	1	1	2	2	2	1
CO4	0	1	1	1	0	1	1	2	2
CO5	0	1	1	1	0	1	1	3	3
Average	0	1	1	1	1	1	1	2	2

3-Strong Correlation, 2-Medium Correlation, 1-Low Correlation, 0-No Correlation

XBC406			ANGULAR JS					Т 0	<b>P</b> 0	<b>S</b> <b>S</b> 0	C 1
С	Р	Α		ý			L	Т	Р	S S	Н
0.5 0.5 0						1	0	0	0	1	
PREREQUISITE: Nil											
COURSE OUTCOMES:											
Course Outcomes						Doma	in	Level			
After the completion of the course, students will be able to											
CO1: <i>Recognize</i> the fundamentals and techniques of Angular JS.						Cognitive		Remember			
CO2	: <i>Express</i> the knowledge on Invoking, MVC, Validation, Communication over http, cookies and file upload in AngularJS					Cognitive Psychomoto	or	Understand Guided Response			
<ul> <li>Organization - Tools - Running Your Application - Testing with AngularJS - Relationship Between Model, Controller, and Template - Communicating Over \$http - Directives and HTML Validation - API Overview - Communicating Between Scopes with \$on, \$emit, and \$broadcast - Cookies - Internationalization and Localization - Wrapping a jQuery Date picker - File Upload in AngularJS</li> <li>Lab: <ol> <li>Create single page web applications using the MVC pattern of AngularJS</li> <li>Understand the programming model provided by the AngularJS framework</li> <li>Define Angular controllers and directives</li> <li>Control Angular data bindings</li> </ol> </li> </ul>											
LI	ECTU	RE	TUTORIAL PRACTICAL		SELF	STUDY	TOTAL				
	15		0	0	0		1	15			
TEXTBOOKS											
<ol> <li>Brad Green, Shyam Seshadri "Angular JS", O'Reilly Media, 2013.</li> <li>Ken Williamson "Learning Angular JS: A Guide to AngularJS Development" O`reilly Media, 2015.</li> </ol>											
REFERENCES											
E-REFERENCES											
E-K	LFEKI		www.w?achoola.com/	angular/							
1. https://www.woscnools.com/angularis/ 2. www.tutorialsteacher.com/angularis/angularis-tutorials											
v		٨		L 2	T	P 1	SS	C			
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------	----------------------------------------------------	--------	--------	--------	--------	------------	--	--	--
	DC301.	A	MATI AB PROCRAMMING	5	0	1	0	4			
C	Р	Α		L	Т	Р	SS	Н			
3	0	0.5		3	0	2	0	5			
Pre	requis	ite	Computer Fundamentals								
			Course Outcome	Do	main		Leve	<u>.</u> 1			
CO1	Recog progra	<i>nize</i> ammin	the fundaments of procedural and functional g.	Cog	nitive	Re	mem	ber			
CO2	Expres	ss the f	unctionalities of Matlab data types and structures	Cog	nitive	Uı	nderst	and			
CO3	Describethe concepts and guidelines of Be able to set up simpleUnderstandCO3real-life numerical problems such that they can be solved and visualized using basic codes in Matlab.CognitiveUnderstand										
CO4	Actively <i>Participate</i> in <i>Choosing</i> the appropriate techniques and Affective Response Cognitive Apply										
CO5	CO5 Analyze the techniques used in the various stages of Software Cognitive Analyze Analyze										
UNIT I INTRODUCTION TO MATLAB 9+6											
MATI progra Lab: Explor Arithr Array:	MATLAB, Loops and execution control, working with files: Scripts and Functions, Plotting and program output. <b>Lab:</b> Explore MATLAB Arithmetic Operations Arrays										
UNIT	TII A	PPRO	XIMATIONS AND ERRORS				9+6				
Approximations and Errors- Defining errors and precision in numerical methods, Truncation and round-off errors, Error propagation, Global and local truncation errors. <b>Lab:</b> Functions Control flow Plotting											
UNIT	III L	INEAI	REQUATIONS				9+6				
Linear Equations- Linear algebra in MATLAB, Gauss Elimination, LU decomposition and partial pivoting, Iterative methods: Gauss Siedel Method. Lab:											
Programming in MATLAB Loading and saving data Linear equations											
UNIT	IV R	EGRE	SSION AND INTERPOLATION				9+6				

Regression and Interpolation - Introduction, Linear least squares regression (including lsq curve fit function), Functional and nonlinear regression (including lsqnonlin function), Interpolation in MATLAB using spline and pchip.

Lab:

Linear regression Linear least squares regression

### UNIT V NON - LINEAR EQUATIONS

9+6

Nonlinear Equations- Nonlinear equations in single variable, MATLAB function fzero in single variable, Fixed-point iteration in single variable, Newton- Raphson in single variable, MATLAB function fsolve in single and multiple variables, Newton-Raphson in multiple variables.

Lab:

Nonlinear Equations

Newton- Raphson in single variable

45 0 30 0 75	LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL
	45	0	30	0	75

### **TEXT BOOKS:**

1. Fausett L.V. (2007) Applied Numerical Analysis Using MATLAB, 2nd Ed., Pearson Education

2. Essential MATLAB for Engineers and Scientists, 6th Edition, Brian Hahn; Daniel T. Valentine, Academic Press, Web ISBN -13: 978-0-12-805271-6,

### **REFERENCES:**

- 1. Roger.S. Pressman, Software Engineering A Practitioner's Approach, Sixth Edition, Tata McGraw Hill Higher Education, 2010.
- 2. Ian Sommerville, Software Engineering, Ninth Edition, Pearson Education Inc., 2012.

# **E- REFERENCES:**

- 1. http://www.rspa.com/spi/
- 2. https://www.wiziq.com/tutorials/software-engineering
- 3. http://www.tutorialride.com/software-engineering/software-engineering-tutorial.htm
- 4. https://www.tutorialspoint.com/software_engineering/software_engineering_tutorial.pdf

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc CS		РО							
<b>D.5C C5</b>	1	2	3	4	5	6	7	1	2
CO1	2	1	1	2	1	1	1	1	2
CO2	3	1	3	2	1	1	1	1	2
CO3	2	2	2	2	1	2	1	1	1
CO4	3	2	2	2	1	1	1	2	2
CO5	2	2	2	2	2	1	1	2	1
Average	2	2	2	2	1	1	1	1	2

VD		р			L	T P	s	S	C		
ХВ	C501	В			3	0 1	(	J	4		
C	D	•	PROGRAMMING IN JAVA		т	тр		_	тт		
25	P 0 E	A		·			5	>	<u> </u>		
<b>3.3</b>			TE: Computer Fundamentals		3	0 2		,	5		
PKE	KEQU	151	TE: Computer Fundamentals	Damai		aa1					
Cour	se O	utco	mes	Domai	n	level					
Artei	the c	comj	bletion of the course, students will be able to								
CO1		Bas Sys	se Management System and Relational database tem	Cognitiv	re F L	Remem Indersta	oer Ind				
CO2		Ree and	<i>cognize</i> and <i>Explain</i> the Transaction Management d Storage implementation techniques	Cognitiv	re R L	lememb Indersta	er Ind				
CO3		Ska the	<i>cetch and show</i> the Relational data base design for e real time application.								
CO4		An que	<i>alyze and Apply</i> proper Relational data base eries	<i>lyze and Apply</i> proper Relational data base Cognitive Analyze Apply							
CO5		De: for	Design and Constructan application with suitablePsychom otorOriginationorm design and data baseOriginationOriginationOrigination								
UNIT I INTRODUCTION 9+6											
Fundamentals of Object-Oriented Programming – Java Evolution – Overview of Java											
Lang	guage	- C	onstants, Variables and Data Types - Operators a	nd Expr	essi	ons – I	Deci	isic	on		
Mak	ing ar	nd B	ranching – Decision Making and Looping								
Lab											
1	. Sim	ple J	ava Programs								
2	. Dec	isior	n Making, Branching and Looping								
UNI	<u>T II</u>		CLASSES, OBJECTS AND METHODS					9-	+6		
Intro	ducti	on -	Defining a Class – Adding Variables – Adding Me	ethods –	Crea	ating C	)bje	cts	; –		
Acce	ssing	Clas	ss Members – Constructors – Method Overloading	– Static I	Vlem	bers –	Ne	stir	ng		
of M	lethoo	1s –	Inheritance – Overriding Methods – Final Varia	bles and		ethods	- ]	H1n	al		
Class	ses – I	Fina.	lizer Methods – Abstract Methods and Classes – Vi	sibility C	Lonti	:01					
Lau	Con	otru	ctors and Mothod Overloading								
1	Inha	orita	nce and Method Overriding								
I INII'	T III	lina	ARRAYS INTERFACE AND PACKAGES					9.	+6		
Arrays One Dimensional Array Creating an array Two Dimensional Array Strings											
Arrays - One-Dimensional Array – Creating an array – Iwo-Dimensional Array – Strings –									,		
Lab	010			6111800							
5.Arrays and Strings											
6. Interfaces and Packages											
UNI	ΓΙ		MULTITHREADED PROGRAMMING					9-	+6		
Crea	Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life										
Cycl	Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority –										

Synchronization – Implementing the 'Runnable' Interface – Managing Errors and Exceptions – Types of Errors – Exceptions – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions

Lab

7.Multi Threading

8. Exception Handling

## UNIT V APPLET PROGRAMMING

9+6

Introduction – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to HTML File – Running the Applet – Passing Parameters to Applets – Getting Input from the User – Abstract Windowing Toolkit Lab

9. Applet Programming

10. Event Handling

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
45	-	30	-	75

**REFERENCES:** 

1. Bruce Eckel, Thinking in Java (4th edition) Herbert Schildt,

2. Java: The Complete Reference (9th edition)

- 3. Y. Daniel Liang, Introduction to Java Programming (10th edition)
- 4. Paul Deitel, Harvey Deitel, Java: How To Program (10th edition)
- 5. Cay S. Horsttnann, Core Java Volume I Fundamentals (10th edition)

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

R Sa CS	PO							PS	0
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	0	1	2	0	1	0	0	3	3
CO2	0	1	1	1	0	0	0	1	1
CO3	1	3	1	1	1	0	0	3	3
CO4	1	3	2	1	1	1	1	3	3
CO5	3	3	2	2	1	1	1	3	2
Average	1	2	2	1	1	0	0	3	2

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

					L	Т	Р	S S	С		
>	(BC501	lC			3	0	1	0	4		
-	D		PYTHON PROGRAMMING		Ŧ	m	n	S			
	P	A				1	r o	S			
3.5 PRFI	0.25 REOUI	0.25 SITE: `	XBC402		3	0	2	0	5		
Cour	se Out	comes		Domain		Level					
After	the co	mpletio	on of the course, students will be able to	2 0							
CO1	Anal typic	<i>yze</i> Mu al syste	ltidimensional Intelligent model from m	Cognitive	2	Analyze					
CO2	<i>Evalı</i> objec	<i>uate</i> va ts	rious mining techniques on complex data	Cognitive	ę	E	valı	ıate	5		
CO3Understand Data Mining processes using Open Source Data Mining tool.Under d								erst	an		
CO4Choose the appropriate techniques and algorithms for extracting dataCognitive AffectiveA							ppl esp	y onc	1		
CO5 <i>Recognize</i> the knowledge of data mining, data preprocessing and data warehousingCognitive Psychomoto r							Analyze Perception				
UNI	ГΙ	INT	RODUCTION					9	+6		
Intro Writi Inter Expr Mod Argu Lab: 1.Wr 2. Wr 3. Wr a giv	<ul> <li>Introduction to Python, Python, Features of Python, Execution of a Python, Program, Writing Our First Python Program, Data types in Python. Python Interpreter and Interactive Mode; Values and Types: int, float, boolean, string, and list; Variables, Expressions, Statements, Tuple Assignment, Precedence of Operators, Comments; Modules and Functions, Function Definition and use, Flow of Execution, Parameters and Arguments.</li> <li>Lab:</li> <li>1.Write a program to demonstrate different number data types in Python.</li> <li>2. Write a program to perform different Arithmetic Operations on numbers in Python.</li> <li>3. Write a program to create, concatenate and print a string and accessing sub-string from a given string.</li> </ul>										
UNIT II OPERATORS IN PYTHON								9	+6		
Operators in Python, Input and Output, Control Statements. Boolean Values and operators, Conditional (if), Alternative (if-else), Chained Conditional (if-else if-else); Iteration: state, while, for, break, continue, pass; Fruitful Functions: Return Values, Parameters, Local and Global Scope, Function Composition, Recursion.											
Lab: 4.Wr 02:26 5.Wi	Lab: 4.Write a python script to print the current date in the following format "Fri Oct 11 02:26:23 IST 2019" 5. Write a program to create, append, and remove lists in python										

6. Write a program to demonstrate working with tuples in python.								
UNIT III ARRAYS IN PYTHON 9+6								
Arrays in Python, Strings and Characters. Strings: String Slices, Immutability, String								
Functions and Methods, String Module: Lists as Arrays. Illustrative Programs: Square								
Root, gcd, Exponentiation, Sum an Array of Numbers, Linear Search, Binary Search.								
Lab:								
7. Write a program to demonstrate working with dictionaries in python.								
8. Write a python program to find largest of three numbers.								
9. Write a Python program to construct the following pattern, using a nested for loop								
*								
* *								
* * *								
* * * *								
* * * * * * * * * * * * * * * * * * *								
* * *								
**								
*								
UNIT IV FUNCTIONS 9+6								
Functions, Lists and Tuples. List Operations, List Slices, List Methods, List Loop, Mutability, Aliasing, Cloning Lists, List Parameters; Tuples: Tuple Assignment, Tuple as Return Value; Dictionaries: Operations and Methods; Advanced List Processing - List Comprehension; Illustrative Programs: Selection Sort, Insertion Sort, Merge sort, Histogram.								
Lab:								
10. Write a Python script that prints prime numbers less than 20.								
11. Write a python program to define a module to find Fibonacci Numbers and import								
the module to another program.								
12. Write a python program to define a module and import a specific function in that								
module to another program.								
UNIT V EILES AND EXCEPTION 9+6								
Files and Exception: Text Files Reading and Writing Files Format Operator: Command								
Line Arguments, Errors and Exceptions, Handling Exceptions, Modules, Packages:								
Illustrative Programs: Word Count, Copy File.								
Lab:								
13.Write a program that inputs a text file. The program should print all of the unique words in the file in alphabetical order.								
14. Write a Python class to convert an integer to a roman numeral.								

15. Write a Python class to reverse a string word by word.										
LECTURE TUTORIAL PRACTICAL SELF-STUDY TOTAL										
45	0	30	0	75						
TEXTBOOKS:										
1. Mark Lutz, Learn	ing Python									
2. Tony Gaddis, star	ting out with Py	thon								
3. Kenneth A. Lamb	ert, Fundamenta	ls of Python								
REFERENCES:										
1. James Payne, Beginning Python using Python 2.6 and Python 3										

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

P Se CS	РО								PSO		
D.50 C5	1	2	3	4	5	6	7	1	2		
CO1	3	2	3	2	2	1	1	1	3		
CO2	2	3	2	3	1	1	1	2	3		
CO3	3	2	3	2	2	2	1	2	3		
CO4	3	2	2	3	1	1	1	1	3		
CO5	2	3	2	2	2	2	1	2	3		

YB	C50	2 1			L	Т	Р	S S	С	
	C30	ZΑ			4	2	0	0	6	
			SOFTWARE ENGINEERING							
С	Р	А			L	Т	Р	S S	H	
2.9	0	0.1			4	2	0	0	6	
Prer	equ	isite	Computer Fundamentals							
			Course Outcome	Doma	ain		Lev	vel		
CO1	<i>Re</i> En	<i>cogni</i> ginee	<i>ze</i> the significance of entire Software ring process.	Cognit	ive	Rei	nem	ber		
CO2	Exp Ree	<i>press</i> quire	the functionalities of Cost Estimation and ment Specification Techniques.	Cognit	ive	Un	ders	tand		
CO3	De De	<i>scribe</i> sign,	<i>cribe</i> the concepts and guidelines of Software gn, Coding, Testing and Maintenance.							
CO4	Actively <i>Participate</i> in <i>Choosing</i> the appropriate Affective Cognitive applications as a team.									
CO5	Analyze the techniques used in the various stages of Software Engineering.CognitiveAnalyze									
UN	UNIT I INTRODUCTION AND PLANNING A SOFTWARE 12+6									
Intro Mar a S Org	oduo nage olut aniz	rial Is ion s ation	- Definitions – Size Factors – Quality and sues. Planning a Software Project – Defining th Strategy – Planning the Development Pr al Structure – Other Planning Activities.	Produ e Probi rocess	ıctiv lem –	vity – Do Plai	fac evel nnir	tors opin ng	– ng an	
UN	IT I	I C S	OST ESTIMATION AND REQUIREMENTS PECIFICATION	5			12	+6		
Software Cost Estimation – Cost Factors – Cost Estimation Techniques – Staffing – Level Estimation – Estimating Software Maintenance Costs. Software Requirements Definition – Software Requirement Specification – Formal Specification Techniques – Language and Processors for Requirements.										
UN	UNIT IIISOFTWARE DESIGN12+6									
Software Design - Fundamental Design Concepts - Modules and Modularization										
Criteria - Design Notations - Design Techniques - Detailed Design Considerations										
- Real Time and Distributed System design - Test Plans - Milestones, Walkthroughs and Inspections - Design Guidelines.										
UNIT IV   IMPLEMENTATION   12+6										
Imp and Han	UNIT IV       INIPLEMENTATION       12+6         Implementation Issues – Structured Coding Techniques – Coding Style – Standard and Guidelines – Documentation guidelines – Data Abstraction – Exception Handling – Concurrency Mechanisms.									

UNIT V	TES	<b>STING AND MA</b>	INTENANCE		12+6					
Verificatio	n and	l Validation Tech	niques - Quality	Assurance – Wa	lkthroughs and					
Inspection	Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging –									
System Testing - Formal Verification. Software Maintenance - Enhancing										
Maintainability during Development - Managerial aspects - Configuration										
Management – Source Code Metrics – Other Maintenance Tools and Techniques.										
LECTU	LECTURE TUTORIAL PRACTICAL SELF-STUDY TOTAL									
60	60 30 - 90									
TEXT BOO	OKS:									
Richard E	Fairle	ey, Software Eng	ineering Concept	ts, Tata McGraw-	Hill Publishing					
Company	Limit	ed, New Delhi, 20	008.							
REFEREN	CES:									
3. Roger.	5.Pres	sman, Software	Engineering A	Practitioner's A	pproach, Sixth					
Edition	, Tata	a McGraw Hill Hi	gher Education, 2	2010.						
4. Ian Sor	nmer	ville, Software Er	gineering, Ninth	Edition, Pearson	Education Inc.,					
2012.										
WEBSITE	S:									
5. http://www.rspa.com/spi/										
6. https://www.wiziq.com/tutorials/software-engineering										
7. http://www.tutorialride.com/software-engineering/software-engineering-										
tutoria	l.htm									
8. https:/	/ww	w.tutorialspoint.c	com/software_en	gineering/softwa	re_engineering					
_tutoria	al.pdf									

B.Sc CS		PO										
<b>D.3C</b> C3	1	2	3	4	5	6	7	1	2			
CO1	2	1	1	2	1	1	1	1	2			
CO2	3	1	3	2	1	1	1	1	2			
CO3	2	2	2	2	1	2	1	1	1			
CO4	3	2	2	2	1	1	1	2	2			
CO5	2	2	2	2	2	1	1	2	1			
Average	2	2	2	2	1	1	1	1	2			

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

10				L	T	P	SS	C	
	C50	)2B	COMDUTED ETHICS	4	2	0	0	6	
C	Р	Δ		L	Т	Р	SS	н	
2.5	0.5	5 0	-	4	2	0	0	6	
PRE	ERE	QU	ISITE: XBC103		1	1			
On	the	suce	essful completion of the course, students will	be able	e to				
Cou	irse	Ou	come	Domai	n	Level			
CO	$1 \begin{bmatrix} S \\ t \end{bmatrix}$	<i>Stat</i> hey	² the basics of graphics and <i>identify</i> how can be used in computer.	Cogniti	ve	Kr	nowled Analyz	ge, e	
CO2	$2 \begin{vmatrix} I \\ C \end{vmatrix}$	R <i>eca</i> Geo1	<i>ll</i> and <i>distinguish</i> the various 2-D netrical transforms and their applications.	Cogniti	ve	Kr Corr	nowled npreher	ge, 1sion	
CO	B B T T	Expl repro	<i>ain</i> the basic elements of <b>3</b> -D Object esentation, and <i>identify</i> various 3D of of ormation techniques	Cogniti	ve	Com	preher Analysi	ision, s	
CO4	4 <i>F</i>	Kno	<i>w</i> about visible surface detection methods	Cogniti	ve	Kı	nowled	ge	
COS	5 r a	Cons neth appl	<i>truct</i> various computer animation ods and <i>choose</i> animation for an Perication.	sychomo	otor	Perception, Set			
UN	IT -	Ι	Introduction				12+6	)	
The	Ne	ed f	or Computer Ethics Training and Historical M	lileston	es.				
UN	IT -	Π	Computer Ethics				12+6	)	
Defi Con inte Con Wor expe	inin npu llect npu rkpl ert s	g tr ter tual ter ace syste	e Field of Computer Ethics, Computer ethics Ethics i. Computer crime and computer secur property rights iii. Computer hacking and t and information system failure v. Invasion c and on the Internet vi. Social implications of ems vii. The information technology salesman	s codes rity ii. the cre of priva artifici issues.	, Sar Softv ation acy. al ir	nple ware n of y Priva ntellig	theft viruse acy in gence	and s iv. the and	
UN	IT -	III	Transparency				12+6	)	
Trai	nspa	aren	cy and Virtual Ethics, Free Speech, Democracy	y, Infor	mati	ion A	Access	•	
UN	IT -	IV	Developing the Ethical Analysis				12+6	)	
Dev Acc	reloj oun	ping tabi	the Ethical Analysis Skills and Profes lity, Government Surveillance.	ssional	Va	lues,	Priv	acy,	
UN	IT -	V	Boundaries of Trust				12+6	)	
Bou in C	nda Dnlir	iries ne E	of Trust, Trust Management, Wikipedia, Vi nvironment, Intellectual Property, Net neutral	irtual lity	Trus	st, Pla	agiaris	sm	

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL									
60	30	0	0	90									
<b>TEXT BOOKS:</b>													
1. "Comput	ter Graphics C ve	rsion", Donald H	learn and M. Pau	line Baker,									
Pearson education.													
2. "Computer Graphics Second edition", Zhigandxiang, Roy Plastock,													
Schaum's	s outlines, Tata M	cGraw hill editio	on.	-									
<b>REFERENCE B</b>	OOKS:												
1. Deborah,	, J, Nissenbaun, I	H, Computing, E	thics & Social Va	lues, Englewod									
Cliffs, Ne	ew Jersey, Prentic	e Hall, 1995.											
2. Spinello,	R, Tavani, H, T, I	Readings in Cybe	r ethics, Sudbury	, MA, Jones and									
Bartlett F	ublishers, 2001.		-										
3. Bynum,	T, W; Rogerso	on, S, Compute	er Ethics ar	nd Professional									
Responsi	bility, Blackwell,	2004											
	•												

					L	Т	Р	S S	С
XBO	C <b>50</b> 2	2C			4	2	0	0	6
			<b>COMPUTER ORGANIZATION &amp; ARCHITEC</b>	TURE				6	
C	Р	Α			L	Т	Р	S S	Η
3	0	0			4	2	0	0	6
PREF	REÇ	UIS	SITE: Digital Principles						
Cour	L	Level							
After	the	con	npletion of the course, students will be able to						
CO1	F C	Recoz omp	<i>gnize</i> the operation of functional units of a puter	Cognitive Psychomo or	ot	Kno	owle	dge	
CO2	I a	) <i>esci</i> .ssoc	<i>ribe</i> the computational operation of hardware units iated with a computing device.	Cognitive	2	Cor on	npr€	ehen	si
CO3	I	Demo	<i>onstrate</i> the operation of processing unit.	Cognitive Psychomo or	e ot	Арј	olica	tion	L
CO4	0	Com	<i>vare</i> the performance of different types of memory	Cognitive	Analyze				
CO5	ŀ	Reco	<i>gnize</i> the operation of interfacing devices.	Cognitive	:	Kno	owle	dge	
UNIT	ГΙ	ł	BASIC STRUCTURE OF COMPUTERS				12-	+6	
Funct progr mode instru	cam es -	al U s - ] Basi ons.	Memory operations - Instruction and instruction Memory operations - Instruction and instruction ic I/O operations - stacks and queues - subroutine	sequencii s - Encoc	inst ng ling	ruci - ac g of	ldre Ma	s ai essi: Ichi	nd ng ne
UNIT	ΓII	A	ARITHMETIC UNIT				12-	⊦6	
Arith numb	met	tic - and	Design of fast adders - Binary Multiplication - I operations.	Division ·	- F1	oati	ng	poi	int
UNIT	ΓII	I	BASIC PROCESSING UNIT				12-	+6	
Proce bus c conce Perfo	essir orga epts orma	ng u niza - Ha ance	nit - Fundamental concepts - Execution of a compl tion - Hardwired control – Micro programmed co azards - Inference on instruction sets. Data path and issues.	ete instru ntrol - pi l control	ictic ipel cor	on - inin Isido	Mu g - erat	ıltip Bas ion	ole sic s -
UNIT	ΓIV		MEMORY SYSTEM				12-	+6	
RAM secon	an Idar	d R y sto	OM - Cache memories - Performance considerations of the second se	ons - Virt	ual	me	mo	ries	3 -
UNI	ľV		NPUT/OUTPUT OKGANIZATION				12-	+6	

Accessing I/O devices - Interrupts - DMA - Buses - Interface circuits - standard I/O												
Interfaces. Case study of one RISC and one CISC processor.												
LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL								
60	30	0	0	90								
TEXT BOOKS												
1. Carl Hamacher, ZvonkoUranesic, SafvatZaby., 2002. "Computer Organisation",												
5th editior	n, McGraw Hill.	-	_	0								
2. John P Ha	ayes, "Computer A	Architecture and C	Organisation", 3rd e	edition, McGraw								
Hill .			0									
REFERENCES												
1. David A P	'atterson and John	L. Hennessy, 2002	. " Computer Orgar	nization and								
Design Th	e Hardware / Soft	tware Interface", 2	nd edition, Harcou	rt Asia, Morgan								
Kaufmann	1.			0								
E-REFERENCE												
1. www.tuto	rialspoint.com/co	mputer_logical_or	ganization/									
2. <b>nptel</b> .ac.ir	n/courses/1061060	92/	0									

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

PSACS				PSO					
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	3	2	3	2	2	1	1	1	3
CO2	2	3	2	3	1	1	1	2	3
CO3	3	2	3	2	2	2	1	2	3
CO4	3	2	2	3	1	1	1	1	3
CO5	2	3	2	2	2	2	1	2	3

XB	SC50	2D			L 4	T 2	P 0	C 6		
	1		COMP	UTER NETWORKS	6			r		
C	Р	Α				L	Т	Р	Η	
2.8	0	0.2				4	2	0	6	
COU	RSE	OUT	COMES		DOMA	IN	LE	EVEL		
After	the	compl	etion of the course, st	udents will be able to	<u>)</u>		D	1		
CO1	Recognize the importance of computer networks and explain the network models, media, layering.Cognitive (Cognitive)Reinchioer (Cognitive)CO1Recognize the importance of computer networks and explain the network models, media, layering.PsychomotorGuided									
CO2	CO2 Describe the functionalities of layer and <i>indicate</i> the various network connecting devices.									
CO3	De	monst	<i>rate</i> the unicast and r	nulticast routing.	Cognitive Psychom	otor	Unders Respor	stand ise		
CO4	Ma ap	<i>atch</i> ar plicati	nd <i>Show</i> the protocol	for real time	Cognitive Psychom	otor	Remen Set	nber		
CO5	An a	alyze simple	the protocols of appli e network.	cation layer and <i>Des</i>	<i>ign</i> Cognitive Psychom	e otor	Analyz Origina	e ation		
UNIT	ГΙ	]	NETWORK FUNDA	MENTALS AND PH	IYSICAL LAY	(ER		1	12+6	
Introd Stand – The	duct lards OSI	ion – s and A Mode	Data Communication Administration - Netw 1 – Transmission Mec	ns – Networks – Ne vork Models – Protoc lia – Switching.	etwork Types ol Layering – 1	– Inte FCP/I	ernet 1 P Prote	Histo ocol S	ry – Suite	
UNIT	ΓII	]	DATA LINK LAYER					1	12+6	
Intro Corre Wirel	duct ection less I	ion to n - Da Netwo	Data Link Layer – ta Link Control - M. rks - Connecting Dev	Link Layer Addres AC – Wired LANs: ices and Virtual LAN	ssing - Error Ethernet - Wi Ns.	Detec ireless	tion a LANs	nd E 8 – O	rror ther	
UNIT	ΓIII	]	NETWORK LAYER					1	12+6	
Intro Routi	duct ing.	ion to	Network Layer – N	etwork Layer Proto	cols – Unicast	Rout	ing –	Mult	icast	
UNIT	ΓIV	r	FRANSPORT LAYE	R				1	12+6	
Introd Trans	duct smiss	ion to sion C	Transport Layer – T ontrol Protocol – SCT	Fransport Layer Prot P.	tocols – User	Datag	gram P	rotoc	:ol –	
UNIT	ΓV		APPLICATION LAY	ER AND SECURITY	<u> </u>			1	12+6	
Introd and H	duct: HTTI	ion to ? – FTI	Application Layer - 5 ? - Electronic Mail - 7	Standard Client Serv TELNET – DNS.	er Protocols –	Multi	media	- W	WW	
LI	ECTI	URE	TUTORIAL	PRACTICAL	SELF STUD	Y	TO	TAL		
	60		30	0	0			90		
TEXT	Г BO	OKS:								
<ol> <li>BehrouzA.Forouzan, "Data Communications and Networking", Fifth Edition, McGraw Hill Education, 2013.</li> </ol>										

## **REFERENCES:**

- 1. Achyut S Godbole, Atul Hahate, "Data Communications and Networks", Second Edition, New Delhi: Tata McGraw-Hill Education, 2011.
- 2. Andrew S. Tanenbaum, David J. Wetherall "Computer Networks", Fifth Edition, Pearson Education Inc., 2013.
- **3.** William Stallings, "Data and Computer Communications", Tenth Edition, Pearson Education, 2014.

### **E-REFERENCES**

- Video Lecture Link: http://media.pearsoncmg.com/ph/streaming/esm/tanenbaum5e_videonotes/tanen baum_video Notes.html
- **2.** Lecture Slides, Multiple Choice Questions, Animations Link:
- http://highered.mheducation.com/sites/0072967757/student_view0/index.html
- 3. Lecture Slides: http://www.mhhe.com/engcs/compsci/forouzan/

## Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc				PO				PS	<b>50</b>
<b>D.</b> 5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

					L	Т	Р	s s	C		
X	BC5	03A			3	2	1	0	6		
			.NET TECHNOLOGIES			1					
C	Р	Α			L	T	Р	S S	н		
2.8	1	0.2			3	2	3	0	8		
PRE	REQ	UISITE	: Nil								
COL	JRS	E OUTC	OMES:								
			Course Outcomes	Domai	n		Lev	ve1			
Afte	r the	comple	tion of the course, students will be able to	201114				•			
CO1		Recogniz	ze the basics of .net frame work	Cognitive		Rem	em	ber			
		0	Psychomoto	or	Perception						
CO2	2 ]	Express a	and <i>relate</i> decision and iteration control	Cognitive		Understand					
	5	, structure	s to implement programs	Psychomoto	or	Perceptior					
CO3	3 ]	Predict a	nd <i>Create</i> database connection and	Cognitive		Understa					
	1	nanipul	<i>ate</i> the data source	Psychomoto	or						
						Guio	ded				
						Resp	oon	se			
CO4	E (	Choose a	nd <i>Apply</i> controls and <i>reproduce</i> well-	Cognitive		Rem	lem	ber			
	5	structure	ed .NET applications	Psychomoto	or	App	ly				
						Guio	ded				
						Resp	oon	se			
CO5	5 0	Construc	et and <i>demonstrate</i> various real-world	Cognitive		Crea	ate				
	applications in ASP.NET with C# Psychomotor										
				Affective		Valu	iing	- )			
UNI	ΤI	INT	RODUCTION TO .NET FRAMEWORK			9+	6+9				
Man	lage	1 Code	and the CLR- Intermediate Language, Meta	data and JIT	ГС	omp	ilati	on	-		

Managed Code and the CLR- Intermediate Language, Metadata and JIT Compilation – Automatic Memory Management - Visual Studio .NET – Using the .NET Framework - The Framework Class Library- .NET objects – ASP .NET - .NET web services – Windows Forms

Lab: 1. Familiarizing with .NET Environment.

# UNIT II INTRODUCTION TO C#.NET

9+6+9

Variables and constants – data types – declaration. Operators – types – precedence. Expressions. Program flow – Decision statements – Loop statements – Value data types – Structures, Enumerations. Reference data types- Single dimensional – Multi-dimensional arrays – jagged arrays – dynamic arrays Windows programming– creating windows Forms – windows controls –Events. Menus and Dialog Boxes– Creating menus – menu items – context menu – Using dialog boxes – showDialog () method.

Lab: 1. Work with Console

- 2. Looping and Conditional Statements
- 3. Working with various Controls such as timer, calendar, etc.,
- 4. Create basic text editor

	APPLI	CATION DEVEL	JPMENT USING	ADO .NEI	9+6+9
Architectu	are of AI	DO.NET – ADO.NE	T providers – Coni	nection - Command	l – Data Adapter –
Dataset.	Accessin	g Data with ADO.	NET - Connecting	to Data Source, Ac	cessing Data with
Data set a	nd Data	Reader - Create an	ADO.NET applicat	ion - Using Stored I	Procedures.
				_	
Lab:					
1. Ins	sert, Dele	ete, Update and Mo	dify Operations		
2. Sto	ore and r	etrieve data using I	Data Grids		
UNIT IV	INTRO	DUCTION TO A	SP.NET		9+6+9
ASP.NET	Features	: Change the Hom	e Directory in IIS -	- Add a Virtual Dir	ectory in IIS Set a
Default De	ocument	for IIS - Change Lo	og File Properties fo	or IIS - Stop, Start, or	Pause a Web Site.
Web Cont	trols - H	TML Controls, Usi	ng Intrinsic Contro	ols, Using Input Va	lidation Controls,
Selecting (	Controls	for Applications - A	Adding web control	ls to a Page. Server (	Controls - Types of
Server Co	ntrols - A	Adding ASP.NET C	ode to a Page.		
Lab:					
1. Wo	orking w	ith various Control	S		
2. Us	ing store	ed Procedures			
3. Fo	rm Creat	tion with HTML			
UNITV		CATIONS OF ASI	P.NET WITH C#	1	9+6+9
Windows	Applicat	tion: Creation of Me	edia Player. Web Ap	plications: Job Porta	al, E-mail and SMS
	line too				
Server, Or	ume 1000	d ordering System.			
Server, Or Lab:	une 1000	d ordering System.			
Server, Or Lab: 1. Rea	al Time P	d ordering System. Projects			
Server, Or Lab: 1. Rea LECTU	al Time P J <b>RE</b>	d ordering System. Projects TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
Server, Or Lab: 1. Rea LECTU 45	al Time P J <b>RE</b>	d ordering System. Projects TUTORIAL 30	PRACTICAL 45	SELF-STUDY 0	TOTAL 120
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO	al Time P J <b>RE</b>	d ordering System. Projects TUTORIAL 30	PRACTICAL 45	SELF-STUDY 0	TOTAL 120
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Day	al Time P J <b>RE</b> DKS vid Char	d ordering System. Projects TUTORIAL 30 opell, "Understand	PRACTICAL 45 ing .NET", 2nd Ed	SELF-STUDY 0 dition, Addison-We	TOTAL 120 esley Professional,
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Day 200	al Time P J <b>RE</b> <b>DKS</b> vid Chap 6.	d ordering System. Projects TUTORIAL 30 opell, "Understand	PRACTICAL 45 ing .NET", 2nd Ed	SELF-STUDY 0 dition, Addison-We	TOTAL 120 esley Professional,
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Day 200 2. And	al Time P J <b>RE</b> DKS vid Chap 6. drew Tro	d ordering System. Projects TUTORIAL 30 ppell, "Understand pelsen, PhilJapikse ,	PRACTICAL 45 ing .NET", 2nd Ed "Pro C# 7 With .N	SELF-STUDY 0 dition, Addison-We ET and .NET Core"	TOTAL 120 esley Professional, , Apress, 2017.
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Day 200 2. And 3. Mat	al Time P J <b>RE</b> <b>DKS</b> vid Chap 6. drew Tro tthew M	d ordering System. Projects TUTORIAL 30 opell, "Understand oelsen, PhilJapikse , acdonald, "ASP.NI	PRACTICAL 45 ing .NET", 2nd Ed "Pro C# 7 With .N ET: The Complete	SELF-STUDY 0 dition, Addison-We ET and .NET Core" Reference", McGra	TOTAL 120 esley Professional, , Apress, 2017. w Hill Education,
Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Dav 200 2. And 3. Mai 201	al Time P J <b>RE</b> <b>DKS</b> vid Chap 6. drew Tro tthew M 7.	d ordering System. Projects TUTORIAL 30 opell, "Understand pelsen, PhilJapikse , acdonald, "ASP.NI	PRACTICAL 45 ing .NET", 2nd Ed "Pro C# 7 With .N ET: The Complete	SELF-STUDY 0 dition, Addison-We ET and .NET Core" Reference", McGra	TOTAL 120 esley Professional, , Apress, 2017. w Hill Education,
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Server, Or Lab: 1. Rea LECTU 45 TEXTBOO 1. Dav 200 2. And 3. Mai 201 REFEREN 1. Hen 2. Ma	al Time P JRE DKS vid Chap 6. drew Tro thew M 7. ICES rbert Sch rino Pose	d ordering System. Projects TUTORIAL 30 ppell, "Understand pelsen, PhilJapikse , acdonald, "ASP.NI ildt, "C# 4.0 The Co adas, "Mastering C	PRACTICAL 45 ing .NET", 2nd Ed "Pro C# 7 With .N ET: The Complete omplete Reference" # and .NET Framew	SELF-STUDY 0 dition, Addison-We ET and .NET Core" Reference", McGra ', McGraw-Hill Edu work", Packt Publis	TOTAL 120 esley Professional, , Apress, 2017. w Hill Education, cation, 2010. hing, 2016.
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B Sa CS		PO											
D.50 C5	1	2	3	4	5	6	7	1	2				
CO1	3				1		1						
CO2	2	2	1	2	3	0	2	1					
CO3	2	3	2	2	3	1	2	2					
CO4	2	3	2	2	3	0	2	2	3				
CO5	1	3	3	2	3	1	2	3	2				
Total	10	11	8	10	13	2	9	8	5				
Scaled Value	2	3	2	2	3	1	2	2	1				

# COs versus POs mapping

 $1\text{-}5 \rightarrow 1, 6\text{-}10 \rightarrow 2, 11\text{-}15 \rightarrow 3$ 

																-			
VI		<b>2</b> D													L	Τ	Р	S S	C
X	SC50	3B	<u> </u>										<b>.</b>		3	2	1	0	6
			GL	MP (G	INU IM	IAGE	E <b>M</b> .	ANI	PUL	ATIC	)N ŀ	'RO	GRA	M)		1	1	G	
C	Р	Α													L	Τ	Р	5 S	Η
2.5	0.5	0													3	2	3	0	8
PRI	EREÇ	QUIS	ITE:	Basic	s of colo	ors													
Cou	ırse (	Outco	omes	5									Dor	nain		Lev	vel		
After the completion of the course, students will be able to																			
<b>Recognize</b> the importance of Imaging Concepts Cognitive										e	Rei	men	nbei	r					
	L	a	nd G	Graphic	: Forma	ts.							Psy	chom	otor	Per	cep	tion	۱
CO	2	E C	<i>xpres</i> Creati	<i>ss</i> the f ing Im	functioı ages.	nalitie	es o	feac	h Ca	pturi	ng a	nd	Cog	nitiv	e	Un	der	stan	ıd
CO	3	E P	<i>mplc</i> rope	oy the erties.	unders	stand	ing	of t	he v	variou	s G	rid	Cog	nitiv	e	Ар	ply		
CO	4	U	Itiliz	e the I	mage N	Ianip	oula	tions	5.				Cog	nitiv	e	Ap	ply		
CO	5		)esigi	<i>n</i> and	Establi	sh th	e Ci	reati	ng a	nd Dr	rawi	ing	Cog	nitiv	e	Cre	eate		
	5	to	ools.										Psy	chom	otor	Set			
UN	I TIV	[														<u>9+6+9</u>			
Ima Ras	ging ter &	Con Vect	cepts tor In	s and nages,	Graphi Color I	c For Mode	rmat el.	ts: Pi	ixel,	Resol	lutic	on, l	file S	ize, l	mage	Cor	npre	essi	on,
UN	JIT I	I															9+6	+9	
Cap Inte	turir rface	ng an e.	d Cr	eating	Images	s: Sav	ving	Ima	ges,	Scanr	ning	Ima	ages,	Fami	liariza	ation	wit	h G	IMI
UN	IT II	Ι															9+6	<b>+</b> 9	
Sett	ings:	Fore	egrou	and an	d Backę	groun	nd C	Color	rs, Gi	rid Pro	oper	rties	•						
UN	IT IN	7															9+6	<b>+</b> 9	
Ima Rota	ge N ating	/lanip and	oulat flipp	ions:  I oing in	Resiziną nages.	g ima	ages	s, cro	oppi	ng in	nage	es, N	Aovii	ng ar	nd Co	pyin	g iı	nag	jes,
UN	IT V																9+6	<b>+</b> 9	
Wo: Too	rking ls: D	g witł rawii	n Tex ng to	kt: Crea ools, Pa	ating ar ainting t	id edi tools	itin	g tex	t, Fo	rmatt	ing	Text	t, Ap	plyin	g text	wra	ps.		
I	LECT	URE	Ξ	TU	TORIA	L	I	PRA	CTI	CAL	5	SELI	F - ST	TUD	Y	TC	OTA	L	
	4	5			30				45				-				120		
REI	FERE	NCE	S:		_														
1. K	ay Ri	ichter	, GIN	AP 2.8 ·	- Buch (	e-boo	ok) The	Dac	lr of		Λ		1040 4	<b>C</b> :	to NI-				
Eve	rythin	g. Kii	ndle F	anu Ka Edition		vare,	1 ne	с <b>В</b> 00	K OI	GIMP	, АС	om	jiele (	Juide	to mea	ariy			
	<u>,</u>	8, 11																	

B Sc CS	РО								50
<b>D.3C</b> C3	1	2	3	4	5	6	7	1	2
CO1	2	2	2	2	2	1	1	2	2
CO2	2	3	3	3	3	1	1	3	2
CO3	2	3	3	3	3	1	1	3	2
CO4	2	3	3	3	3	1	1	3	2
CO5	2	3	3	3	3	1	1	3	2
Averge	2	3	3	3	3	1	1	3	2

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

x	BC50	3C	ΤΗΓΟΡΥ ΟΓ COMPUTATION		L 3	T 2	P 1	S S O	C 6	
					0	4	-	U	U	
C	Р	Α			L	Т	Р	S S	C	
2.5	0.5	0			3	2	3	0	8	
PRE	REQI	UISITE	: XBC103, XBC301	-						
COL	JRSE	OUTC	OMES	DOMA	AIN LEVEL					
After	r the o	comple	tion of the course, students will be able to	1						
CO1	Ree	cognize	the significance of Web Technology.	Cognitive Psychomot	or	Re Pe	Remember Perception			
CO2	Exp	oress th	e knowledge on HTML, CSS and JavaScript	Cognitive		U	ndei	rstar	nd	
600	and	<u>i PHP i</u>	n Web Design.	0						
CO3	Em	ploy th	e understanding of the Client and Server-	Cognitive		A	oply	7		
	S1d	e script	s and actively <i>participate</i> in teams for the	Affective		Re	Respond			
CO4		<i>ilize</i> the	web designing tools effectively in the real-							
001	wo	rld app	lications.	Cognitive		A	pply	T		
CO5	CO5 <i>Design</i> and <i>Establish</i> the Website or Web based Cognitive Psychor									
TI	501 NIT 1	tware.		1 Sychoniot	01	50	0+	3+0	)	
Ante	mata	· Introv	Justian to Formal Proof Additional Forms	of Proof In	-du	ctiv		Prop	fc	
Finit Auto Lab:	e Au omata ruage	tomata (NFA) of Bina	(FA), Deterministic Finite Automata (DFA), , Finite Automata with Epsilon	, Non-Dete Transitions	erm 3.	inis	tic	Fin	ite	
		T					01	<u>.</u>		
Dog	NII I Ilan	Evor	and Languages Regular Eve	maggion E	· ^	and	9+	3+9	lan	
Evpr		Expre	ving Languages not to be Regular Clo	Sure Prope	A i		F R4	gu	lar lar	
Lang	ruage	s, Eaui	valence and Minimization of Automata.	suic i tope	.1 110	.5 0.		gu	iai	
Lab:	,	-, -1								
Lang	guage	of Bina	ary strings such that the third symbol from th	e end is a 2	Zer	0.				
U	NIT I	II					9+	3+9	)	
Cont	ext F	ree Gra	ammars and Languages: Context Free Gra	mmar (CF	G),	Par	se	Tre	es,	
Amb	oiguit	y in G	rammars and Languages, Definition of T	he Pushdo	owr	ιA	uto	ma	ta,	
Lang	guage	s of a I	Pushdown Automata, Equivalence of Push	down Aut	oma	ata	anc	l CI	FG	
Dete	rmini	istic Pu	shdown Automata.							
Lab:										
Language of parenthesized expressions with matching left and right parenthesis.										
UN	UNIT IV 9+3+9									
Prop	erties	s of Cor	itext Free Languages: Normal Forms for CFG,	Pumping	Len	nma	for	r CI	FL,	
Clos	Closure Properties of CFL, Turing Machines, Programming Techniques for TM,									
Varia	ations	s of T	M, Non-Universal TM, Universal TM.							

Lab:										
Language of Bin	Language of Binary strings with equal number of Zeros and Ones.									
UNIT V				9+3+9						
Undecidability: A Language that is not Recursively Enumerable (RE), an Undecidable										
Problem that is I	RE, Undecidable Pr	oblems about Turi	ng Machine, Post's	Correspondence						
Problem, The Cl	asses P and NP.									
Lab:										
Language gener	ated by the gramm	har {a n bn cn $\mid$ n ³	1}							
Language { ap	p is prime}									
LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL						
45	30	45	0	120						
<b>TEXT BOOKS:</b>										
1. J.E. Hoper	oft, R. Motwani and	J.D. Ullman, "Intro	duction to Automata	Theory,						
Languages	and Computations"	second Edition Pe	arson Education 200	)7						

Languages and Computations", second Edition, Pearson Education, 2007.H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education, 2003.

Table 1:	Mapping of COs with Pos
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Course	РО								50
Outcomes	1	2	3	4	5	6	7	1	2
CO1	2	0	1	1	0	1	0	1	2
CO2	2	2	2	1	1	0	1	2	3
CO3	1	2	2	1	2	1	1	2	3
CO4	0	1	2	2	2	1	0	2	3
CO5	1	2	3	2	3	2	1	3	3
Average	1	1	2	1	2	1	1	2	3

1-5 → 1, 6 -10 → 2, 11 -15 → 3 3-High Relation, 2-Medium Relation, 1-Low Relation, 0-No Relation

						1					
		1 A			L	Т	Р	S S	C		
	DC304	<b>H</b> A	IMACE DDOCESSING		4	2	0	0	6		
			IMAGE PROCESSING					C			
C	Р	Α			L	Т	Р	5 5	H		
2.5	0.5	0			4	2	0	0	6		
PRE	REQU	JISITE	• /•								
-			COURSE OUTCOMES	DOMA	IN		LE	VEI	د		
Afte	r the c	comple	tion of the course, students will be able to								
CO1	Rec ma	<i>cognize</i> themat	e the significance image fundamentals and ical transforms necessary for image	Cognitive		R	Remember				
$CO^{2}$			b.								
02	techniques the knowledge on image enhancement Cognitive								d		
CO3	Em	ploy a	А	pply							
CO4	IIti	<i>lize</i> an	d exploit the image segmentation								
001	pro	cedure	s	Cognitive		А					
CO5	Rec	noni74	the color models	Cognitive		C					
	nee	031120		cognitive		C	reute				
UNI	ΤI	L	DIGITAL IMAGE FUNDAMENTALS					1	2+6		
Digi	tal Im	age Fu	ndamentals: Elements of Visual Perception, L	ight, Brigh	ntne	ss Ao	lapt	ion a	and		
Disc	rimina	ation, I	mage Sensing and Acquisition, Image Sample	ling and Q	)uar	ntiza	tion,	Pix	els,		
Som	e Bas	ic Rela	ationships between Pixels, Coordinate Conv	ventions, 1	Imag	ging	Gee	ome	try,		
Pers	pectiv	e Proje	ection, Linear and Nonlinear Operations.								
UNI	TII	I	MAGE ENHANCEMENT					1	2+6		
Imag	ge Enł	nancen	nent in the Spatial Domain: Intensity transfor	rmations,	Con	trast	Stre	etchi	ng,		
Hist	ogran	n Equal	lization, Correlation and Convolution, Basics o	of Spatial I	Filte	ring,	Sm	ooth	ing		
Filte	rs, Sha	arpeni	ng Filters, Gradient and Laplacian.								
UNI	тш	F	ILTERING IN THE FREQUENCY DOMAIN	J				1	2+6		
Filte	ring ii	n the F	requency domain: Hotelling Transform Fouri	er Transfo	rms	and	pro	nert	ies		
FFT	(Dec	imatio	n in Frequency and Decimation in Time	er Transie Technia	ines		onvo	oluti	ion.		
Corr	Correlation, 2 -D sampling, Discrete Cosine Transform, Frequency domain filtering.										
UNI	TIV	I	MAGE RESTORATION AND RECONSTRU	ICTION				1	2+6		
Image Restoration and Reconstruction: Basic Framework Interactive Restoration Image											
defo	deformation and geometric transformations, image morphing. Restoration techniques.										
Nois	e cha	racteri	zation, Noise restoration filters. Adaptive filt	ers, Linea	r, Po	sitic	on ir	vari	lant		
degr	adatio	ons, Es	timation of Degradation functions, Restoration	n from pro	oject	ions					
81				r*	,		-				
U	NIT V	7 C	OLOR IMAGE PROCESSING					1	<u>2+6</u>		

Color Image Processing, Color Fundamentals, Color Models, Pseudo color Image Processing, Basics of Full-Color Image Processing, Color Transformations, Smoothing and Sharpening, Color Segmentation. Morphological Image Processing, Dilation and Erosion, Opening and Closing., Extensions to Gray -Scale Images. Image Segmentation: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds.

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
60	30	0	0	90

#### **TEXT BOOKS:**

1. Digital Image Processing, Rafael C. Gonzalez and Richard E. Woods, 4th Edition, Prentice Hall.

#### **REFERENCES:**

- 1. Anil K. Jain, Fundamentals of Digital Image Processing, Prentice Hall.
- 2. Stan Birchfield, Image Processing and Analysis, Cengage Learning.

**E-REFERENCES:** 

https://www.tutorialspoint.com/image processing/

## Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

PSa				PO				PS	<b>50</b>
D.5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

					L	Т	Р	S S	С	
XB	C504B				4	2	0	0	6	
			INTERNET TECHNOLOGIES							
С	Р	Α			L	Т	Р	S S	Н	
2.5	0.5	0			4	2	0	0	6	
PRER	EQUIS	SITE	: Computer Networks							
A. C.	.1		Course Outcomes	Doma	in		Lev	7el		
After										
CO1	Iden	tify	the terms related to the Internet and how the	Cognitive		Rer	nem	ber		
Internet is changing the world. Psychomotor								10N		
CO2	Desi	gn ai	nd connected to the Internet and demonstrate	Cognitive		Cre	ate			
CO2	the a		y to use the world wide web	<u> </u>		6				
CO3 Perceive the significance electronic mail and other Cogniti							ate	ion		
<u> </u>	nter Base	net-	based services.	r sycholic	nor	rer	<u>ept</u>	ION		
CO4	how	they	<i>e</i> the design principles of the web pages and are created.	Cognitive		Cre	ate			
CO5	Com	bine	<i>the</i> needed internet resources and implement	Cognitive		Ana	alyz	e		
	in th	e bu	siness model							
U	NIT I		INTRODUCTION			12+6				
Introc	luction	: Ov	verview, Network of Networks, Intranet, Extra	net and Ir	nterne	t. W	orld	Wi	ide	
Web,	Doma	in aı	nd Sub domain, Address Resolution, DNS, T	elnet, FTI	<b>P</b> , HT	[P. ]	Revi	iew	of	
TCP/	IP: Fe	atur	es, Segment, Three-Way Handshaking, Fl	ow Contr	rol, E	rror	Co	ontr	ol,	
Cong	estion of	contr	rol.							
			IP DATAGRAM	( 1 1 0	1 1		<u>12</u>	+ <u>6</u>		
IP Da	tagram	I, IPV	4 and IPv6. IP Subnetting and addressing: Clas	sful and C	lassles	55 A0	ddre	essii	ng,	
Subne	etting.		I, IP masquerading, IP tables. Internet Routin	g Protocol	: Koui	ing	-Int:	ra a	nd	
Inter	Domai	n K	outing, Unicast and Multicast Routing, Broad	dcast. Ele	ctroni	2 IVI	a11:	PO	P3,	
SMIT	<u>′.</u> 1177-111		UTMI INTRODUCTION				10	16		
			ation Editors Elements Attributes Heading	Darragram	h Ear	maat	12 [.]	τ <u>ο</u> τ:.	-1.	
Hoad	L: III Tabla	T ict	Block Layout CSS Form Iframe Colore Co	lor nome	n. ror Color	mat	ing 10	, LII Ima	IIK,	
Mane	· man	, LISI	attributes of image area. Extensible Markun I	anguage (	YMI )	· Int	ie. rodi	nna 10tia	ige	
Tree	Svntav	∠ Fl	ements Attributes Validation Viewing X	HTMI in	hrief	CC		crir	ste.	
Introc	luction	$F_{\rm Env}$	vironment Variable GFT and POST Methods		brier		JI U	crr	<i>n</i>	
UN	JIT IV		PERL INTRODUCTION				12-	+6		
PERL	· Intro	oduc	tion Variable Condition Loop Array Implen	nenting d	lata st	ruct	ire.	Ha	sh.	
String	. Regi	ılar	Expression, File handling, I/O handling, I	avaScript:	Basic	s. S	tate	mer	nts.	
comm	ents, v	arial	ole, comparison, condition, switch, loop, break.	Object - st	ring. a	irrav	. Bo	olea	an.	
reg-e>	. Fund	tion	Errors, Validation. Cookies: Definition of coo	kies, Crea	te and	Stor	e a	cool	kie	
with e	exampl	e. Ja	va Applets: Container Class, Components, App	let Life Cy	cle, U	pdat	e m	etho	od;	
Paran	neter p	assir	g applet, Applications.	5		•				
UI	VIT V		CLIENT- SERVER PROGRAMMING				12-	+6		
Client	t-Serve	r pr	ogramming In Java: Java Socket, Java RMI. Th	reats: Ma	licious	cod	e-v	irus	es,	
Trojai	n hors	es, v	worms; eavesdropping, spoofing, modificati	on, denia	1 of s	ervi	ce a	ttac	ks.	

Network security techniques: Password and Authentication; VPN, IP Security, security in electronic transaction, Secure Socket Layer (SSL), Secure Shell (SSH). Firewall: Introduction, Packet filtering, Stateful, Application layer, Proxy.

Internet Telephony: Introduction, VoIP. Multimedia Applications: Multimedia over IP: RSVP, RTP, RTCP and RTSP. Streaming media, Codec and Plugins, IPTV. mywbut.com Search Engine and Web Crawler: Definition, Meta data, Web Crawler, Indexing, Page rank, overview of SEO.

LECTURE	TUTORIAL	PRACTICAL	SELF-STUDY	TOTAL
60	30	-	-	90
<b>REFERENCES:</b>				

- 1. Web Technology: A Developer's Perspective, N.P. Gopalan and J. Akilandeswari, PHI, Learning, Delhi, 2013.
- 2. Internetworking Technologies, An Engineering Perspective, Rahul Banerjee, PHI Learning, Delhi, 2011.

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

R Sa CS	PO								ю
<b>D.5CC5</b>	1	2	3	4	5	6	7	1	2
CO1	1	2	2	1	1	0	0	1	2
CO2	1	3	1	2	2	0	1	2	2
CO3	0	3	1	2	2	1	1	2	2
CO4	0	3	0	2	2	0	1	2	2
CO5	0	3	2	1	3	1	1	3	2
Average	1	2	1	2	2	1	1	2	2

					L	Т	Р	SS	С
XB	C504	łC			4	2	0	0	6
			SYSTEM SECURITY						
C	Р	Α		L	Т	Р	SS	Η	
3	0	0			4	2	0	0	6
PRE	REÇ	QUIS	SITE: XBC103, XBC402						
			Course Outcomes	Dom	ain		L	evel	
Afte	r the	e con	npletion of the course, students will be able to	)					
CO1	ιι	Inde	<i>rstand</i> computer operating systems,						
	d	listri	buted systems, networks and representative	Cognit	tive	R	eme	mber	
	a	ppli	cations.						
CO2	2   I	dent	<i>ify the</i> distributed system attacks, defenses	_	_	_			
	a	igain	st them, and forensics to investigate the	Cognit	tive	Re	eme	mber	,
CO2		itteri	nath						
	, 1	1 <i>nui</i>	yze the basics of cryptography, now it has	Comi	Himo	^	<b>n</b> a 1 17	70	
	1	rod	today	Cogim	live	A	nary	Ze	
CO4			mize the security policies	Cognit	tivo	R	omo	mbor	
$CO_{1}$		Anal	<i>uze</i> the malicious software and DOS attacks	Cognit	tive		nalv	70	
		<u>ייייין</u> ד T	CRYTOCRAHIC TOOLS	Cogini	live		<u>11017</u> C	<u></u> )+6	
Crvi	ntog	ranh	ic Tools- Confidentiality with Symmet	tric Fi	ncrvi	ntion	<u>ר</u> ז ר	Mess	аде
Aut	henti	icatio	on and Hash Functions, Public-Key Encrypt	ion. Di	ioital	Sio	natu	ires a	and
Kev	Ma	nage	ement, Random and Pseudorandom Num	pers. P	racti	cal	App	licati	on:
Encr	ypti	on o	f Stored Data.				rr		
U	NIT	II	USER AUTHENTICATION				9	)+6	
User	r A	uthe	entication- Means of Authentication, Pass	word-B	Basec	l Au	then	ticati	ion,
Toke	en-Ba	ased	Authentication, Biometric Authentication, R	emote	User	Au	then	ticati	ion,
Secu	ırity	Issı	es for User Authentication, Practical App	licatior	n: A	n Iri	is B	iome	tric
Syst	em,	Case	Study: Security Problems for ATM Systems.						
Ul	NIT	III	ACCESS CONTROL				9	)+6	
Acce	ess (	Cont	rol- Access Control Principles, Subjects, O	bjects,	and	Ac	cess	Rig	hts,
Disc	retic	onary	Access Control, Example: UNIX File Access	Control	l, Ro	le - E	Based	1 Acc	ess
Con	trol,	Case	e Study: RBAC System for a Bank.						
U	NIT	IV	DATABASE SECURITY				9	)+6	
Data	abase	e Sec	curity-The Need for Database Security, Data	base M	lanag	geme	ent S	Syste	ms,
Rela	tion	al I	Databases, Database Access Control, Infer-	ence, S	Stati	stica	1 Da	taba	ses,
Database Encryption, Cloud Security.									
U	NIT	V	MALICIOUS SOFTWARE				9	)+6	
Mali	iciou	is Sc	oftware-Types of Malicious Software (Malwa	are), Pi	ropa	gatio	on-	Infec	ted
Con	tent-	-Viru	uses, Propagation-Vulnerability Exploit-W	Vorms,	Pro	opag	atio	n-So	cial
Engi	ineer	ring-	SPAM E-mail, Trojans, Payload-System C	Corrupt	ion,	Pay	load	-Att	ack
Age	nt-Z	Zomł	vie, Bots, Payload-Information Theft- Keylo	oggers,	Phi	shin	g, S	pywa	are,
Payl	load-	-Stea	althing-Backdoors, Rootkits,, Counter m	leasure:	s, I	Deni	al-of	-Serv	vice

Attacks- Denial-of-Service Attacks, Flooding Attacks, Distributed Denial-of-Service Attacks, Application-Based Bandwidth Attacks, Reflector and Amplifier Attacks, Defenses Against Denial -of-Service Attacks, Responding to a Denial-of-Service Attack.

	LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL						
	45	30	0	0	75						
TI	EXTBOOKS:										
1.	1. M. Stamp, "Information Security: Principles and Practice," 2 st Edition, Wiley, ISBN:										
	0470626399, 2011.										
2.	M. E. Whitma	an and H. J. Matto	rd, "Principles of I	Information Secur	ity," 4 st Edition,						
	Course Techr	nology, ISBN: 1111	1138214, 2011.								
3.	M. Bishop, "O	Computer Securit	y: Art and Science	e," Addison Wes	ley, ISBN: 0 -201-						
	44099-7, 2002										
4.	G. McGraw,	"Software Securi	ty: Building Secu	urity In," Addisor	n Wesley, ISBN:						
	0321356705, 2	2006									
RI	EFERENCES:										
1.	David J. Krug	glinski, Inside Vis	ual C++, Microsof	t Press 1992.							
2.	Boar, B.H., I	mplementing Cli	ent / Server Cor	nputing ; A Stra	tegic Perspectre,						
	Mcraw Hill, 1	1993.									
3.	Bouce Elbert,	Client / Server C	omputing, Artech	n. Press, 1994.							
4.	Alex Berson,	Client / Server A	rchitecture, McGr	aw Hill, 1996.							
<b>E-</b> :	REFERENCES	5:									
fiv	edots.coe.psu	.ac.th/~suthon/cs	sw/01%20-%20Cli	ient%20Server%20	Computing.pdf						
wv	ww.bcanotes.c	om/Download/I	DBMS/Rdbms/Cl	ient_Server%20Co	omputing.pdf						

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sa CS	РО								PSO		
D.50 C5	1	2	3	4	5	6	7	1	2		
CO1	1	1	2	1	1	1	1	2	1		
CO2	1	2	1	1	1	1	1	2	1		
CO3	1	1	2	1	1	1	1	2	1		
CO4	1	2	1	1	1	1	1	1	1		
CO5	1	1	3	2	1	1	2	1	1		
Average	1	1	2	1	1	1	1	2	1		

XB	8C6	01A	WEB TECHNOLOGIES	VEB TECHNOLOGIES						
C	Р	Α			L	Т	Р	S S	Н	
2	1	0			3	0	2	0	5	
PR	ERE	QUIS	SITE: Software Engineering			-				
			Course Outcomes	Domai	n		Le	vel		
Aft	er tl	ne con	npletion of the course, students will be able to			<b>D</b>		-		
CO	1	Reco	<i>gnize</i> the significance of Web Technology.	Cognitive Psychomotor		Perception			r 1	
CO	O2     Express the knowledge on HTML, CSS and JavaScript and PHP in Web Design.     Cognitive						Understand			
		Empl	<i>by</i> the understanding of the Client and	and PHP in Web Design.						
CO	CO3 Server-side scripts and actively <i>participate</i> in teams for the creation of static and dynamic web Affective					Res	spor	nd		
со	4	page Utili real v	s. <i>ze</i> the web designing tools effectively in the world applications	Cognitive		Ap	ply			
СО	5	Desig	gn and Establish the Website or Web based	Cognitive		Create				
TIN	тт		Vare.			Set		0	<b>1</b> 6	
Intr Dyn Frai Lat 1. F 2.Ta	rodu nam mes o: orm able	action nic We s - HT natting s, frar	to Web Technology – Concept of Tier – Web F b Pages – HTML Basics – HTML CSS – Links ML forms and Input tags. g tags, ordered list and unordered list. ne, image map and hyperlink.	Pages – Static – Images – Ta	We able	b Pa es –	age Lis	s – ts -		
UN	IT ]	II	CSS & JAVASCRIPT					9	+6	
CSS Din Loc	6 Ba nen opin	sics – sion a g Stat	Texts and Fonts – Links, Lists and Tables – Bo nd Display - Java Script Basics – Functions ements – Forms.	rder and Outl - Events - C	line Cono	– P ditio	osi ona	tior 1 ai	n – nd	
Lab 1.Fo 2. B 3.Fo 4.Lo	ont, ack orm	color grour Valid ing ar	and style Id and Links lation Id Conditional Statements							
UN	IT I	III	PHP BASIC CONCEPTS					9	+6	
PH - Se - ad	P - I lect ldin	Basic S ive an g para	Syntax – Data Types – Variables & Constants in d Iterative flow of controls - PHP arrays & type ameters - Server side includes - Built in functio	PHP - String es - PHP funct ons	an tior	d C de	peı clar	atc ati	ors on	
Lab 1. S	e: trin	gs and	d Operators							
1 ۲.۱		01 (01	111015 and 1111ay5							

3.PHP Forms								
4.PHP Functions								
UNIT IV P	HP ADVANCED	CONCEPTS		9+6				
PHP File Handlin	ng - Opening a File	e - Closing a File -	Check End-Of-File	e - Reading a File				
Line By Line - I	Reading File Char	acter By Character	er - PHP File Upl	load - Exception				
Handling - Crea	ting Custom Exce	eption Class - Re	-Throwing Except	ions - Cookies -				
Sessions - E-Mail	S							
Lab:								
1.File Handling								
2.Exception Han	dling							
3. PHP Sessions a	and Cookies							
UNIT V P	HP & MySQL			9+6				
MySQL Database	e – Connect – Cre	ate DB – Create T	Table – Insert Data	n – Get Last ID –				
Insert Multiple -	Select Data – Dele	te Data – Update I	Data – Limit Data					
Lab:								
PHP with MySQ	L							
LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL				
45	0	30	-	75				
TEXT BOOKS								
1. AchyutS.C	Godbole, AtulKa	hate, "Web Tec	chnologies TCP/	IP To Internet				
Applicatio	on Architectures'	', First Edition,	Tata McGraw-	Hill Publishing				
Company	Limited, 2003.							
2. Elizabeth	Castro, Bruce Hy	slop, "HTML 5 ar	nd CSS 3", Eight I	Edition, Peachpit				
Press, 201	5.	o 1 · 1 //-		1				
3. Thomas A	A. Powell, Fritz	Schneider, "Javas	cript: The Comp	lete Reference",				
Second Ec	lition, Tata McGra	w Hill Education	Private Limited, N	lew Delhi, 2008.				
4. Kevin Tat	roe, Peter MacInty	re and KasmusLe	rdorf, "Programm	ing PHP", Third				
Edition, C	Reilly Media, Inc	., 2015.						
<b>KEFEKENCES:</b>	lan I Altilan daar	wi "Male Teelere	la arri A Darralare	ur'a Davara a tima"				
I. N.P. Gopa	alan, J.Akilandesw	ari, web lechno	biogy: A Develope	er's Perspective,				
2 Thomas A	Powell "HTMI	lg Private Limited	l, 2014. Noto Roforonco" E	ifth Edition Tata				
2. Inomas A McCrow I	Hill Education Priz	a C55. The Comp	Dolb: 2010	initi Eunion, Tata				
		ale Lillilleu, New	Denii, 2010.					
1 munu php pot	ED:	whatianha						
2 mmmu m ² achaa	1.www.php.net/manual/en/intro-whatis.php							
2.000								
3.www.tutorials	point.com							

B Sc CS	РО								PSO		
<b>D.5C</b> C5	1	2	3	4	5	6	7	1	2		
CO1	2	1	1	1	1	1	3	1	0		
CO2	2	1	1	1	1	1	1	1	0		
CO3	2	2	1	1	2	2	2	1	0		
CO4	2	1	1	1	0	1	1	1	0		
CO5	1	1	1	1	1	1	2	1	0		
Average	2	1	1	1	1	1	3	1	2		

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

 $1-5 \rightarrow 1, 6-10 \rightarrow 2, 11-15 \rightarrow 3$ 

-								
				L	Τ	P	SS	C
XBC601B	3	MOBILE APPLICATION AND	<b>`</b>	3	0	1	0	4
		DEVELOPMENT	,					
C P	Α	DEVELOTIVIENT		L	Т	Р	SS	Η
3 0	0			3	0	2	0	5
PREREQ	UISI	TE: Fundamentals of Computer						
Course C	)utco	mes	Domain		Lev	vel		
After the	comj	pletion of the course, students will be abl	e to					
CO1	Rec	ognize the significance of Android	a		<b>D</b> 1			
platform and its architecture						nemt	ber	
CO2	Sun	<i>imarize</i> the knowledge on java, xml						
	wit	h android and <i>detect</i> about the android	Cognitive Understa			and		
	dev	elopment.	Psycholino	Perception				
CO3	Ma	<i>nipulate</i> and utilize the layout,	Cognitive Application					
	resc	ources and user interface.	Affective Receiving					
CO4	To I	know about the database in android	Cognitive		Uno	lerst	and	
CO5	Des	<i>ign</i> and test the android environment						
	usir	ng exception handling, accessing	Cognitive		Cre	ate		
	the	cloud data.						
UNIT I		INTRODUCTION				9	+6	
(Introduc	tion)	What is Android, Android Versions a	nd its Fe	eatu	re S	et, T	Vario	ous
Android	Dev	ices on the Market, Android Market	Application	on S	Stor	e, A	Andro	oid
Developr	nent	Environment System Requirements, An	ndroid SE	DK,	Inst	allir	ng Ja	va,
and ADT	bun	dle - Eclipse Integrated Development E	Invironme	ent	(IDE	Ξ), C	Ireati	ing
Android	Virtu	al Devices (AVDs).						-
Lab:								
1. Installi	ng A	ndroid						
2. Create	a sin	ple application						
UNIT II		ANDROID ARCHITECTURE OVERV APPLICATION	IEW ANI	D		9	+6	

Android Software Stack, The Linux Kernel, Android Runtime - Dalvik Virtual Machine, Android Runtime - Core Libraries, Dalvik VM Specific Libraries, Java Interoperability Libraries, Android Libraries, Application Framework, Creating a New Android Project ,Defining the Project Name and SDK Settings, Project Configuration Settings, Configuring the Launcher Icon, Creating an Activity, Running the Application in the AVD, Stopping a Running Application, Modifying the Example Application, Reviewing the Layout and Resource Files.

Lab:

1. Working with fragments

2. Working with Intents and intent filters.

3. Creating contact based application.									
	ANDROID SOFTWARE DEVELOPMENT	9+6							
UNIT III	PLATFORM AND FRAMEWORK								
Understandir	ng Java SE and the Dalvik Virtual Machine, The Director	ory Structure of							
an Android	an Android Project, Common Default Resources Folders, The Values Folder,								
Leveraging Android XML, Screen Sizes , Launching Mobile Application: The									
Android Manifest.xml File, Android Application Components, Android Activities:									
Defining the	UI, Android Service s: Processing in the Backgrou	und, Broadcast							
Receivers: A	Announcements and Notifications Content Pro	oviders: Data							
Management	, Android Intent Objects: Messaging for Compor	nents, Android							
Manifest XM	L: Declaring Your Components.								
Lab:									
1. Working	g with views								
2. Creating	g Dialogs and toasts								
3. Working	g with Pop-up Menu								
UNIT IV	UNDERSTANDING ANDROID USER	9+6							
	INTERFACES, VIEWS AND LAYOUTS								
Designing fo	r Different Android Devices, Views and View Gr	oups, Android							
Layout Mana	gers, The View Hierarchy, Designing an Android User	Interface using							
the Graphical	Layout Tool Displaying Text with Text View, Retrie	ving Data from							
Users, Using	Buttons, Check Boxes and Radio Groups, Getting D	ates and Times							
from Users, I	Jsing Indicators to Display Data to Users, Adjusting	, Progress with							
Seek Bar, Wo	rking with Menus using views, Gallery, Image Switcl	ner, Grid View,							
and Image Vi	ew views to display images, Creating Animation.								
Lab: 1. Quotes p	rovider app								
2. SQLite da	atabase app								
. 3. Implement	nt notification	016							
UNIT V	DATABASES, INTENIS, LUCATION-BASED	9+0							
Saving and L	ading Files SOI its Databases Android Database De	eign Exposing							
Access to a Da	ta Source through a Content Provider Content Provid	er Registration							
Native Conte	nt Providers Intents and Intent Filters: Intent Ove	rview Implicit							
Intents, Creating the Implicit Intent Example Project, Explicit Intents, Creating the									
Explicit Intent	Explicit Intent Example Application Intents with Activities Intents, Creating the								

Explicit Intent Example Application, Intents with Activities, Intents with Broadcast Receivers. Sending SMS Messages Programmatically, Getting Feedback after Sending the Message Sending SMS Messages Using Intent Receiving, sending email, Introduction to location-based service, configuring the Android Emulator for Location -Based Services, Geocoding and Map-Based Activities Multimedia: Audio, Video, Camera: Playing Audio and Video, Recording Audio and Video, Using the Camera to Take and Process Pictures.

### Lab:

1. Working with exception handling

2. Finding your location using GPS.

3. Bluetooth cor	nmunication / SN	AS communicatio	n	
IECTURE	TUTORIAL	PRACTICAL	SELE STUD	
	TUTOKIAL	IKACIICAL	SELF STOD	I IOTAL
45	0	30	-	75
<b>TEXT BOOK</b>				
1. Android	Programming U	nleashed (1st Edit	ion) by Harwa	ani.
2. Beginnin	g Mobile Applic	ation Developme	ent in the Clo	ud (2011), Richard
Rodger		_		
<b>REFERENCES</b> :				
1. Professio	onal Android 4 A	pplication Develo	opment, 3 rd ed	ition, reto meier,
wiley pı	ublication 2012.			
2. Program	nming Android,	1st Edition, Zigu	ird Mednieks	s, Laird Dornin, G.
Blake M	eike, Masumi Na	kamura, Oreilly p	oublications, 2	011.

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

M.Sc.				PO				PSO		
SE	1	2	3	4	5	6	7	1	2	
CO1	2	1	1	1	1	2	1	1	1	
CO2	3	2	2	2	2	2	2	2	1	
CO3	2	2	2	2	3	2	2	2	1	
CO4	3	2	2	2	2	2	2	3	1	
CO5	3	3	3	3	3	3	3	3	1	
Average	3	2	2	2	2	2	2	2	1	

XBC601C								<b>SS</b> 0	C 4
	1		CLOUD COMPUTING				6	ſ	
C	P	A			L	T	P	SS	H
3 DDEI			TE: Eundementale of Computer		3	0	2	0	5
	<u>\</u> 60 (	$\frac{20131}{2014co}$	mes	Domain		I	evel		
After	the	e comi	pletion of the course, students will be ab	le to					
		Reco	<i>gnize</i> the importance of cloud	Cognitive		R	emer	nher	
CO1		comp	buting behind all communications and	coginave	, ,		Remember		
	day to day life activities. Psychomotor Perc							Perception	
Express the functionalities of each cloud Cognitive							nders	stand	
CO2 services and aware of the various cloud									
		servi	ce providers						
		Empl	<i>oy</i> the understanding of the various	~		A	pply		
CO3 schedu			singta in terms for the greation of	Cognitive	;		Арргу		
		vario	us cloud services			R	Respond		
		114:1:	a the cloud corriges to all offectively in	Cognitive	;	A	pply		
CO4		tho re	ze the cloud services tools effectively in	C					
		ule le		<b>a</b>		0			
CO5		Desig	gn and Establish the cloud services and	Cognitive	;	C	reate		
000		cloud	l storage	Psychomo	otor	S	et		
UNI	ГΙ		INTRODUCTION TO CLOUD COM	PUTING				Ģ	<del>)</del> +6
Defir	nitic	on, ch	aracteristics, components, Cloud ser-	vice prov	vide	r, t	he	role	of
netw	ork	s in C	cloud computing, Cloud deployment	models-	priv	vate	, pi	ublic	&
hybri	ld,		service models, multitenancy, Cloud ec	onomics	and	ben	efits	5, CIC	ud
Azur		ng pia	atiorins - laas: Amazon EC2, Paas: Go	ogie App	) EN	gine	2, IVI	licros	SOIT
Lab:	e, 0	aas.							
1.Inst	tall	Virtua	albox /VMware Workstation with differ	ent flavou	ars o	of lir	nux	or	
wind	ow	s OS v	vith virtualization support						
2. Ins	tall	a C c	ompiler in the virtual machine created u	sing virtu	ial b	ox a	nd	execu	ıte
Simp	le F	rogra	ms			-			
UNI	ГП		VIRTUALIZATION					9	)+6
Virtu	aliz	ation	concepts , Server virtualization, Stor	age virt	uali	zatio	on,	Stora	age
servi	ces,	Ne 	Work virtualization, Service vir		on,	V1	rtua	lizat	ion
Meas	igei	ment	and profiling of virtualized application	ne Hyper	rvic	nuc re	u n KVI	M X	ne, on
VMw	iare	hvpe	rvisors and their features.	is. Hype	1 1 130	J13.	1 1 1	wi, A	C11,
Lab:		, PC							
1.Inst	tall	Goog	gle App Engine. Create hello world a	app and	oth	er s	simr	ole v	veb
appli	cati	ions u	sing python/java.				1		

UNIT III	DATA IN CLOU	D COMPUTING	J	9+6						
Relational data	abases, Cloud file	e systems: GFS a	nd HDFS, BigTab	ble, HBase and						
Dynamo. Mapl	Reduce and ext	ensions: Parallel	l computing, the	e map-Reduce						
model, Paralle	l efficiency of Maj	pReduce, Relatior	nal operations usin	g Map-Reduce,						
Enterprise batc	h processing usin	g MapReduce.	1							
Lab:	1 0 .									
1 Simulate a cl	oud scenario usin	o CloudSim and i	un a scheduling a	loorithm that is						
not present in (	CloudSim	6 010 440 111 4114	un a senea anng a							
UNIT IV	CLOUD SECURI	ΙΤΥ		9+6						
Cloud security	fundamentals. Vi	ulnerability assess	sment tool for clou	Id. Privacy and						
Security in cloud Cloud computing security architecture: General Issues Trusted										
Cloud computi	ng Secure Execu	tion Environmer	nts and Commun	ications. Micro						
- architectures	: Identity Manas	pement and Acce	ess control. Autor	nomic security.						
Security challe	nges · Virtualizati	ion security mar	nagement - virtua	1 threats. VM						
Security Recor	nmendations. VN	A - Specific Secu	rity techniques. Se	cure Execution						
Environments	and Communicati	ions in cloud.								
Lab:										
1. Experiment a	a procedure to tra	nsfer the files from	m one virtual macl	nine to another						
virtual machine	e.									
2. Experiment a	a procedure to lau	nch virtual mach	ine using trystack	(Online						
Openstack Den	no Version)		0 5	Ύ						
ÚNIT V	<b>ISSUES IN CLOP</b>	UD COMPUTIN	G	9+6						
Implementing	real time appl	ication over clo	1 1 1 C T							
Implementing real time application over cloud platform, Issues in Inter-										
cloud environ	ments, QOS Iss	ues in Cloud,	Dependability, d	ues in Inter- ata migration,						
cloud environ streaming in C	ments, QOS Iss loud. Quality of S	ues in Cloud, Service (QoS) mo	Dependability, d	ues in Inter- ata migration, ud computing						
cloud environ streaming in C environment.	ments, QOS Iss loud. Quality of S Cloud Middlewar	ues in Cloud, Service (QoS) mo re. Mobile Cloud	Dependability, d nitoring in a Clor Computing. Inte	ues in Inter - ata migration, ud computing er Cloud issues.						
cloud environ streaming in C environment. A grid of cloud	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing	ues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing	Dependability, d Dependability, d nitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter - ata migration, ud computing er Cloud issues. cation, resource						
cloud environ streaming in C environment. A grid of cloud dynamic recon	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing figuration, Monito	ues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring.	Dependability, d Dependability, d nitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab:	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing figuration, Monito	ues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring.	Dependability, d Dependability, d mitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing figuration, Monito p single node clus	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring.	Dependability, d Dependability, d initoring in a Clor d Computing. Inte , resource optimiz	ues in Inter - ata migration, ud computing er Cloud issues. ation, resource e word count						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo LECTURE	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing figuration, Monito p single node clus <b>TUTORIAL</b>	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring. ster and run simp <b>PRACTICAL</b>	Dependability, d Dependability, d mitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter - ata migration, ud computing er Cloud issues. ation, resource e word count TOTAL						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo LECTURE 45	ments, QOS Iss loud. Quality of 3 Cloud Middlewar Is, Sky computing figuration, Monito p single node clus TUTORIAL 0	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring. ster and run simp <b>PRACTICAL</b> 30	Dependability, d Dependability, d onitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource e word count TOTAL 75						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoc LECTURE 45	ments, QOS Iss loud. Quality of 2 Cloud Middlewar ls, Sky computing figuration, Monito p single node clus TUTORIAL 0	ster and run simp <b>PRACTICAL</b>	Dependability, d Dependability, d mitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource <u>e word count</u> TOTAL 75						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo LECTURE 45 TEXT BOOK	ments, QOS Iss loud. Quality of Cloud Middlewar Is, Sky computing figuration, Monito p single node clus TUTORIAL 0	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring. ster and run simp <b>PRACTICAL</b> 30	Dependability, d Dependability, d onitoring in a Clor d Computing. Inte , resource optimiz ple applications lik SELF STUDY -	ues in Inter- ata migration, ud computing er Cloud issues. cation, resource <u>e word count</u> <u>TOTAL</u> 75						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo LECTURE 45 TEXT BOOK 1. System	ments, QOS Iss loud. Quality of Cloud Middlewar ls, Sky computing figuration, Monito p single node clus TUTORIAL 0 Analysis and Desi	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring. ster and run simp <b>PRACTICAL</b> 30	Dependability, d Dependability, d mitoring in a Clor d Computing. Inte , resource optimiz	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource e word count TOTAL 75						
cloud environ streaming in C environment. A grid of cloud dynamic recon Lab: 1.Install Hadoo LECTURE 45 TEXT BOOK 1. System 1 2. Analysis	ments, QOS Iss loud. Quality of Cloud Middlewar Is, Sky computing figuration, Monito p single node clus TUTORIAL 0 Analysis and Desi & Design of Info	sues in Cloud, Service (QoS) mo re. Mobile Cloud g, load balancing oring. ster and run simp <b>PRACTICAL</b> 30 gn – Awadh rmation system –	Dependability, d Dependability, d onitoring in a Clor d Computing. Inte , resource optimiz Dele applications lik SELF STUDY - James A. Senn –N	ues in Inter- ata migration, ud computing er Cloud issues. ation, resource e word count TOTAL 75 IcGraw Hill						
R Sa CS				PO				PS	SO	
---------	---	---	---	----	---	---	---	----	----	--
D.50 C5	1	2	3	4	5	6	7	1	2	
CO1	1	1	2	1	1	1	1	2	1	
CO2	1	2	1	1	1	1	1	2	1	
CO3	1	1	2	1	1	1	1	2	1	
CO4	1	2	1	1	1	1	1	1	1	
CO5	1	1	3	2	1	1	2	1	1	
Average	1	1	2	1	1	1	1	2	1	

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

			L	Т	Р	SS	С					
XBC6	02A		4	0	0	2	6					
		INTERNET OF THINGS		1								
C	P A		L	T	P	SS	H					
3			4	0	0	2	6					
PRER	EQUIS	ITE: Fundamentals of Computer	Dam		Ta							
After	the com	nletion of the course students will be able t		ain	Le	vei						
CO1	Identi	fu the components of IOT and learn the	0									
001	basic	issues policy and challenges in the	Cognit	ive	Re	memb	er					
	Intern	et	Psycho	omoto	r Pe	rceptio	n					
CO2	Design	t the portable device, program the	a .									
	sensors and microcontrollers											
CO3 <i>Perceive</i> the significance of <i>build</i> ing the Cognitive Create												
software agents in the real time environments Psychomotor Perception												
CO4 Formulate and Establish the cloud-based Cognitive Create												
	comm	unication through wi Fi/ Bluetooth	Psycho	omoto	r Set	ļ						
CO5	Comb	ine the needed internet resources and	Cognit	ive	An	alyze						
	implei	nent in the business model										
UNIT I INTRODUCTION TO IOT, SENSORS AND ACTUATORS 12												
Introd	luction	to IoT: Definition, Characteristics, Applicat	ions,	Evol	ution	, Ena	blers,					
Conne	ectivity	Layers, Addressing, Networking and Coni	nectiv	ity I	ssues	, Net	work					
Config	guratior	ns, Multi -Homing, Sensing: Sensors and Tr	ransdi	ucers	, Clas	ssifica	ation,					
Differ	ent Typ	bes of Sensors, Errors, Actuation: Basics, A	ctuate	or Ty	pes-	Elec	trical,					
Mecha	anical S	DIT ACTUATORS					10					
Basics	of Ne	tworking Communication Protocols Sens	or Ne	otwo	rk N	Iachi	ne to					
Machi	ine Con	munication (IoT Components Inter-Deper	ndenc	ies (		Gate	wave					
Comp	arison	Between IoT & Web Difference Protocols	Comr	olevit	v of	Netw	vorks					
Wireld	oss Not	works Scalability Protocol Classification	MOT	лс.л. Т <i>8</i> -	SMO	ТТ	IFFF					
802.15	A Zigh		WQI	ιœ	UIVIÇ	211,	ILLL					
002.15	, Zigu											
UNIT	III	ARDUINO PROGRAMMING					12					
Intero	perabili	ty in IoT, Introduction to Arduino Prog	gramı	ming	, Inte	grati	on Of					
Senso	rs And .	Actuators With Arduino										
UNIT	IV	PYTHON PROGRAMMING					12					
Introduction to Python Programming, Introduction to Raspberry Pi,												
Implementation of IoT with Raspberry Pi, Implementation of IoT with Raspberry Pi												
UNIT	V	DATA ANALYTICS					12					
Data I	Handlin	g and Analytics, Cloud Computing Fundam	nental	s, Cl	oud C	Comp	uting					
Servic	e Mode	l, Cloud Computing Service Management ar	nd Sec	curity	, Sen	sor-C	Cloud					
Archit	tecture,	View and Dataflow. FOG Computing: In	ntrodu	ictioi	n, Ar	chite	cture,					

Need	, Applicat	tions and Challe	enges. Industrial	IoT, Case Studie	es: Agriculture,
Healt	hcare, Act	ivity Monitoring			
LEC	TURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL
	60	0	0	30	60+30
TEXT	BOOK				
1.	The Inter	rnet of Things: Er	abling Technolog	gies, Platforms, an	d Use Cases",
	by Pethu	ru Raj and Anup	ama C. Raman (C	CRC Press).	
2.	Internet	of Things: A Han	ds-on Approach"	, by A Bahga and	Vijay Madisetti
	(Univers	ities Press)			
REFE	RENCES	:			
1.	Charalar	npos Doukas , Bı	uilding Internet o	f Things with the A	Arduino,
	Create sp	pace, April 2002.			
2.	Dieter U	ckelmann et.al, "	Architecting the I	nternet of Things"	', Springer,
	2011Luig	gi Atzor et.al, "Th	e Internet of Thir	ngs: A survey, ", Jo	ournal on
	Network	s, Elsevier Public	ations, October, 2	2010	
3.	Architec	ting the Internet	of Things - Dieter	Uckelmann: Marl	<ul><li>Harrison:</li></ul>
	Florian N	/lichahelles- (Eds	.) – Springer – 20	11	
4.	Network	s, Crowds, and N	Aarkets: Reasonir	ng About a Highly	Connected
	World - I	David Easley and	l Jon Kleinberg, C	Cambridge Univers	sity Press - 2010
5.	The Inter	rnet of Things: A	pplications to the	Smart Grid and B	uilding
	Automat	tion by - Olivier I	Hersent, Omar Ell	loumi and David H	Boswarthick -
	Wiley -20	012			
6.	Olivier H	Iersent, David Bo	swarthick, Omar	Elloumi , "The In	ternet of
	Things –	Key applications	and Protocols",	Wiley, 2012	
E-RE	FERENCE	S			
1.	http://p	ostscapes.com			
2.	http://w	ww.theinternetc	ofthings.eu/what	-is-the-internet-of-	things

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

P Se CS				PO				PSO		
D.50 C5	1	2	3	4	5	6	7	1	2	
CO1	1	2	2	1	1	0	0	1	2	
CO2	1	3	1	2	2	0	1	2	2	
CO3	0	3	1	2	2	1	1	2	2	
CO4	0	3	0	2	2	0	1	2	2	
CO5	0	3	2	1	3	1	1	3	2	
Average	1	2	1	2	2	1	1	2	2	

							]	L	Т	Р	SS	C
XB	C60	)2B					4	4	0	0	2	6
	-			DAL	A MINING		_	-		<b>_</b>	00	
<u>C</u>	P	A							<u> </u>	P	SS	H
5 DD			ιςιτι				4	4	U	U	2	0
	11rc	EQUI e 011	tcom				Don	naiı	n	Leve	<u></u>	
Af	ter f	he co	mple	tion of the cours	e. students will be	able to		11411			-1	
CO	01	Anai data	<i>lyze a</i> mini	and Demonstrate	e advanced know	ledge of	Cogn	nitiv	e	Ana	alyze	
со	02	Eval class and tech	<i>luate</i> sificat visua nique	and Apply the ion, association lization on real v s on complex dat	d Apply the techniques of clustering, , association finding, feature selection ation on real world data various mining n complex data objects							
со	93	Und prob	<i>erstar</i> olem h	<i>nd and</i> Determinas a data mining	ne whether a rea solution	al-world	Cogn	nitiv	e	Uno	lerstar	nd
CO		Cho	ose ai	<i>ud</i> Apply data mi	ning software and	l toolkits	Cogn	nitiv	e	App	oly	
	94	in a i	range	of applications	C		Affeo	ctive	<b>)</b>	Res	pond	
Recognize and Set up a data mining process for an application, including data preparation, modelling     Cognitive							Analyze					
		and	evalu	ation			Psychomotor Perceptio					n
UN	JIT	Ι	INT	RODUCTION T	O DATA MININ	G						12
Int	rod	uctio	n to I	Data Mining, Uno	derstanding Data,	Relations	to Da	atał	oase,	Stat	istics	,
Ma	nchi	ne Le	earnir	ıg.								
UN	JIT	II	ASS	OCIATION RU	LE MINING							12
As	soci	ation	n Rule	Mining, Level-v	vise Method, FP-T	ree Metho	od, O	)the	r Var	iant	5	
UN	JIT	III	CLA	SSIFICATION								12
Cla	assif	ficatio	on, D	ecision Tree Algo	orithm, CART, PU	BLIC, Pru	ning	; Cla	assifi	catic	on Tre	ee.
UN	JIT	IV	CLU	STERING								12
Clı	ıste	ring	Techı	niques, Clusterin	g of Numeric Data	a, of Ordir	nal Da	ata,	Effic	cienc	y of	
Clu	ıste	ring,	Cons	ensus Clustering	, Spectral Clusteri	ng.						
UN	JIT	V	RO	CANALYSIS								12
Ro Tre	ugh end	ı Set⊺ s, Big	Theor ; Data	y and its Applica , Data Analytics.	ation to Data Mini	ng, ROC /	Analy	ysis	,Data	a Mi	ning	
]	LEC	TUR	RE	TUTORIAL	PRACTICAL	SELF S	ΓUD	Ŷ		TOT	AL	
		60		0	0	30	)			60+	·30	
TE	XT	BOC	)K			_						
	1. Data Mining Techniques (4 th Edition) Universities Press Arun K Pujari											

## **REFERENCES:**

1. Data Mining Introductory And Advanced Topics –Margaret H Dunham, Pearson Education

#### **E-REFERENCES:**

- 1. http://www.tutorialspoint.com/data_mining
- 2. http://www.dataminingconsultant.com/resources.html

## Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

R Sa CS				PO				PS	50
D.50 C5	1	2	3	4	5	6	7	1	2
CO1	3	2	3	2	2	1	1	1	3
CO2	2	3	2	3	1	1	1	2	3
CO3	3	2	3	2	2	2	1	2	3
CO4	3	2	2	3	1	1	1	1	3
CO5	2	3	2	2	2	2	1	2	3

3-Strong Correlation, 2-Medium Correlation, 1-Low Correlation, 0-No Correlation

YB	C60	2C			L	T	P	SS	C		
ЛД		2C	ARTIFICIAL INTELLIGENCE	-	4	0	0	2	6		
C	Р	Α		-	L	Т	Р	SS	Н		
3	0	0			4	0	0	2	6		
PR	ERI	EQU	ISITE: Data Structure	-							
Co	urse	e Ou	tcomes	Do	omai	n	Lev	vel			
Aft	er t	he co	ompletion of the course, students will be able to	1							
CO	1	<i>Ana</i> how	<i>lyze</i> what constitutes "Artificial" Intelligence and to identify systems with Artificial Intelligence	Co	gniti	ve	An	alyze			
Evaluate Al methods, and whichCO2AI methods may be suited to solving a givenCognitiveproblem.Evaluate											
со	3	<i>Und</i> lang	<i>erstand</i> a given problem in the uage/framework of different AI methods.	Co	gniti	ve	Un	dersta	nd		
со	4	Choo and supp	<i>ose an</i> algorithm on a problem formalization, state the conclusions that the evaluation ports.	Со	gniti	ve	Ap	ply			
со	5	<i>Reco</i> Intel	<i>ognize</i> the limitations of current Artificial ligence techniques	Co	gniti	ve	An	alyze			
UNIT I INTRODUCTION TO ARTIFICAL INTELLIGENCE 12											
Int	rod	uctio	n to Artificial Intelligence: Definition of AI; Turi	ng	Test;	Bri	ef H	istory	7 of		
AI.	Pro	blen	n Solving and Search: Problem Formulation; Search	hSp	bace;	Stat	es vs	5. Noc	les;		
Tre	e	Sear	ch: Breadth-First, Uniform Cost, Depth-First,	Dej	pth-L	limi	ted,	Iterat	ive		
LIN	epei IIT	ning, H	INFORMED SEARCH						12		
Inf	orm	ed S	Gearch: Greedy Search: A* Search: Heuristic Fun	ctio	n: A	dmi	ssib	ility a	and		
Co	nsis	tenc	y; Deriving Heuristics via Problem Relaxation	1.	Loca	l Se	earcl	n: Hi	11 -		
Cli	mbi	ng;	Simulated Annealing; Genetic Algorithms; Loca	al S	earcl	n in	Co	ntinu	ous		
Spa	aces	. Pla	ying Games: Game Tree; Utility Function; Opti	mal	l Stra	ategi	ies; ]	Minir	nax		
Alg	gori	thm;	Alpha-Beta Pruning; Games with an Element of C	Cha	nce.	Bey	ond	Class	ical		
Sea	irch	: Se	earching with Nondeterministic Actions; S	bear	ching	3 V	vith	Par	tial		
Ob	serv	vatio	ns; Online Search Agents; Dealing with Unknowr	n En	iviroi	nme	ents				
UN	IIT	III	PLAYING GAMES						12		
Kn	owl	edge	e Representation and Reasoning: Ontologies, Fou	ınd	atior	is of	f Kn	owled	dge		
Rej	pres	enta	tion and Reasoning, Representing and Reasoning	abc	out O	bjec	ts, R	lelatio	ons,		
Eve	ents	, Ac	tions, Time, and Space; Predicate Logic, Situation	on (	Calcu	ılus,	De	script	ion		
Logics, Reasoning with Defaults, Reasoning about Knowledge, Sample Applications.											
Kej	pres	Inde	ng and Reasoning with Uncertain Knowledge. Propondence Bayes Rule Bayesian Networks Pro	roda bab	adilit	y, C c In	onn		1 to		
Sample Applications											
UN		IV	KNOWLEDGE REPRESENTATION AND REA	ASC	ONIN	JG			12		
Rej	pres	entii	ng and Reasoning with Uncertain Knowledge: Pr	roba	abilit	у, C	lonn	ectior	ı to		
Log	gic,	Inde	ependence, Bayes Rule, Bayesian Networks, Pro	bał	oilisti	c In	fere	nce, a	and		

Sample Applications. Planning: The STRIPS Language; Forward Planning; Backward Planning; Planning Heuristics; Partial-Order Planning; Planning using Propositional Logic; Planning vs. Scheduling

UNIT V CONSTRAINT SATISFACTION PROBLEMS

12

Constraint Satisfaction Problems (CSPs): Basic Definitions; Finite vs. Infinite vs. Continuous Domains; Constraint Graphs; Relationship with Propositional Satisfiability, Conjunctive Queries, Linear Integer Programming, and Diophantine Equations; NP - Completeness of CSP; Extension to Quantified Constraint Satisfaction (QCSP). Constraint Satisfaction as a Search Problem; Backtracking Search; Variable and Value Ordering Heuristic; Degree Heuristic; Least-Constraining Value Heuristic; Forward Checking; Constraint Propagation; Dependency-Directed Backtracking;

LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL
60	0	0	30	60+30

#### **TEXT BOOK**

Elaine Rich, Kevin Knight, Shivashankar B Nair, Artificial Intelligence, Third Edition, McGraw Hill Edition

#### **REFERENCES:**

Russell Stuart Jonathan and Norvig Peter, Artificial Intelligence: A Modern Approach, 3rd Edition, Prentice Hall, 2010

## Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc CS				РО				PS	50
<b>D.50 C</b> 5	1	2	3	4	5	6	7	1	2
CO1	2	1	1	1	1	1	3	1	0
CO2	2	1	1	1	1	1	1	1	0
CO3	2	2	1	1	2	2	2	1	0
CO4	2	1	1	1	0	1	1	1	0
CO5	1	1	1	1	1	1	2	1	0
Average	2	1	1	1	1	1	3	1	2

ХВ	C6(	)2D			L	T	P	SS 2	C	
	Cut		<b>COMPUTER GRAPHICS</b>		4	U	0	2	0	
С	Р	Α			L	Τ	Р	SS	Η	
3 DD			ISITE: Algorithms		4	0	0	2	6	
		e Ou	tcomes	D	omai	n	Lev	zel		
Aft	er t	he co	ompletion of the course, students will be able to							
СО	01	Ana com	<i>lyze</i> the concepts and relevant mathematics of puter graphics.	С	ogniti	ve	An	alyze		
со	Evaluate various algorithms to scan, convert the basic geometrical primitives, transformations, area filling, clipping.Evaluate									
CO3 Understand the importance of viewing and Cognitive Understand Understand										
со	4	Cho ima	ose $a$ design application that display graphic ges to given specifications.	С	ogniti	ve	Ap	ply		
со	5	<i>Reco</i> Virtu	<i>ognize</i> the fundamentals of animation and ual reality technologies	С	ogniti	ve	An	alyze		
UN	JIT	I	APPLICATION AREAS OF COMPUTER GRA	PH	IICS				12	
Ap	plic	atio	n Areas of Computer Graphics, Overview of Graph	nics	Syste	ems	and	Devi	ces.	
Poi	ints	and	Lines, Line Drawing Algorithms, Mid -Point Circle Primitives, Polygon Filling, Algorithms, Curve C	e ai	nd Ell	ipse	e Alg Pozie	orith	MS.	
Spl	ine	Cur	ves.	5011	eratio	лі, I	JEZIC		L D-	
UN	JIT	II	2-D GEOMETRICAL TRANSFORMS						12	
2-E	) G	eom	etrical Transforms: Translation, Scaling, Rotatio	n,	Refle	ctio	n ar	nd Sh	ear	
Tra	nsf	orma	ations Composite Transforms, Transformation	ns 1.	betw	een	Co	ordir	ate	
Sys	sten	18. 2-	D Viewing: The Viewing Pipeline, Viewing Cool	rd11 5	nate l	kete:	renc	e Frai Climp	me,	
Al	nac zori	thms	s- Cohen-Sutherland and Cyrus Beck Line	rui C	lippi	15. L ng	Alo	orith	mg ms.	
Sut	ther	land	-Hodgeman Polygon Clipping Algorithm.	-	F F	-0	C	,		
UN	лт	ш	3-D OBJECT REPRESENTATION						12	
3-E	)	Obie	ct Representation: Polygon Surfaces, Oua	dri	ic S	urfa	ces,	Sp	line	
Rej	pres	, senta	tion. 3-D Geometric Transformations: Transla	tio	n, R	otati	lon,	Scali	ng,	
Ref	flect	tion	and Shear Transformations, Composite Transfo	orm	ation	s, 3	-D '	Viewi	ng:	
Vie	ewin	ıg Pi	peline, Viewing Coordinates, View Volume, Gener	ral	Proje	ctio	n Tra	instoi	rms	
	и СІ J <b>IT</b>	10011 10	USIBLE SURFACE DETECTION METHODS						12	
Vis	sible	Sur	face Detection Methods: Classification, Back -Face	De	tectio	n, D	eptł	1- Buf	fer.	
Sca	nlii	ne, D	epth Sorting, BSP-Tree Methods, Area Sub-Divis	sior	n and	Óct	ree	Meth	ods	
Illu	ımiı	natio	n Models and Surface Rendering Methods: Bas	sic	Illum	ninat	tion	Mod	els,	
Pol	ygo	on Re	endering Methods Computer Animation: Design	of	Anin	natio	on S	equer	nce,	

General Co	mput	er Animation Fur	nctions Key Frame	e Animation, Anim	nation Sequence,				
Motion Cor	ntrol	Methods, Morphi	ng, Warping (Onl	ly Mesh Warping)					
UNIT V	VIR	TUAL REALITY			12				
Virtual Rea	lity:	Basic Concepts,	Classical Compor	nents of VR System	m, Types of VR				
Systems, Three-Dimensional Position Trackers, Navigation and Manipulation									
Interfaces, Gesture Interfaces. Input Devices, Graphical Rendering Pipeline, Haptic									
Rendering	Pipel	ine, Open GL Ren	dering Pipeline.	Applications of Vi	rtual Reality.				
LECTUR	E	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL				
60		0	0	30	60+30				
TEXT BOC	ЮK								
1. Dona	ald H	learn and M. Paul	ine Baker, "Comp	outer Graphics wit	h Open GL",				
Pren	tice I	Hall.							
2. R.K	Mau	rya, "Computer C	<b>Graphics</b> with Virt	tual Reality", Wile	у				
REFERENCES:									
1. "Computer Graphics Principles & practice", Foley, Van Dam, Feiner and									
Hug	hes, I	Pearson Education	า						

Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

R Sc				PO				PS	50
D.5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

												L	Т	Р	SS	C	
XB	BC603A MACHINE LEARNING											4	0	0	2	6	
C	P A											T	Т	D	66	TT	
<u> </u>	r 0	A 0										L 4	0	<b>r</b>	2	п 6	
PR	ER	EOU	ISIT	' <b>E:</b> D	ata N	/lining	g					-	v	U		Ŭ	
Co	urs	e Ou	tcom	nes			5				D	oma	in	Lev	vel		
Aft	er t	he co	omple	letion	n of tl	ne cou	ırse	e, students	will be	e able to							
со	Analyze the supervised, unsupervised machine learning approaches										C	ognit	ive	An	alyze		
CO	2	Und	ersta	and 1	inear	algeb	ora o	concepts.			C	ognit	ive	Un	dersta	and	
CO	<b>Understand</b> a regression machine learning algorithm for solving a problem.									C	ognit	ive	Un	and			
СО	4	Cho	ose a	ı regi	ılarizı	ation c	conc	cepts and so	olve the	problem.	C	ognit	ive	Apply			
CO	5	Reco	ogniz	e the	e neu	ral net	two	ork model			C	ognit	ive	Analyze			
UN	JIT	Ι	INT	ΓRO	DUC	TION	J									12	
Co	nce	pt of	Mac	chine	e Lea	rning,	, A	pplication	s of M	lachine L	ear	ning,	Key	v ele	ment	s of	
Ma	chi	ne L	earn	ing,	Sup	ervise	ed i	vs. Unsuj	pervise	ed Learn	ing,	Sta	tistic	al I	Learn	ing:	
вау	yesı	an N	letho	oa, I	ne Na	aive B	aye	es Classifie	er.								
UN	IIT	<u>II</u>	LIN	NEA	R AL	GEBR	RA	1		1 0			-1			12	
Sof	twa	are's	tor I	Mac	hine	Learn	ing	; and Line	ear Alg	gebra Ov	verv	iew:	Plot	ting	of D	ata,	
veo	ctor	1zati Avai	on, N Iabla	viatri	ces a:	na ve nas M	CTO A A T	rs: Additi( FLAR	on, Mu	Itiplicati	on,	Irans	spose	e and	a inve	erse	
usi	ng	avai	lable	100	1 Suci	1 45 10	17 1 1	LAD.									
UN	IIT	III	REC	GRE	SSIC	N						_				12	
Lin	lear	Reg	ressi	ion:	Pred	iction	us	sing Linea	ır Regi	ression,	Gra	dient	De	scen	t, Lir	near	
Reg	gres	sion	with	n one	e Vari	able, I	Line	ear Regres	sion w	nth Mult	iple	Varia	ables	5, PO	lynor	nial	
I Keg	gree	ic Ro	, rea	ature		inng/a	5er 200	rossion ve	Jgistic	Regress	ion:		ssin gigti		on us	sing	
wit	$h \alpha$	ne V	ariab	ole ai	, Log 1d wi	th Mu	ultii	ple Variab	les.	ai Kegre	55101	I, LU	gisti		egress	51011	
							1							<u> </u>			
		IV	REC	GUL				TT1	- 1- 1	- ( )	(:1	1	Δ	1:-	- 1	12	
Reg	gula	arizat	tion i	anc in Li	l 1tS	Utili And Lu	ity:	Ine pr	oblem	01 UV Regulariz	ernt	ting, m an	Ap 1 Bia	911C	ation Variar	0I	
ιιε	<u></u>								551011, 1		an	in an		13/ 1	ariar		
UN	IIT	V	NEU		$\frac{1}{1}$ D	ETWO	DRF	KS	1						<b>.</b> .	<u>12</u>	
Int	roc	luctio	on, N Smadi	Mod	el Ke	eprese	enta	ition, Gra	dient	Descent	VS.	Perc Dom	eptr	on	I rain	ing,	
Pro	pa	gatio	n Alg	gorit	hm.	ent, Ivi	lun	nayer ren	eption	i s, mun	cias	skep	nese	mai	1011, Ľ	DACK	
I	LEC	TUR	E	T	UTO	RIAL	_	PRACT	ICAL	SELF	STU	DY		TC	TAL		
		60		1	(	)		0			30			60	)+30		

TEXT	BOOK
1.	Ethem Alpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT
	Press, 2009.
2.	Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill
	Education, 2013.
REFE	RENCES:
1.	Christopher M. Bishop, "Pattern Recognition and Machine Learning" by
	Springer, 2007.
2.	Mevin P. Murphy, "Machine Learning: A Probabilistic Perspective" by The
	MIT Press, 2012.

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc CS				РО				PSO		
<b>D.5C C5</b>	1	2	3	4	5	6	7	1	2	
CO1	2	1	1	1	1	1	3	1	0	
CO2	2	1	1	1	1	1	1	1	0	
CO3	2	2	1	1	2	2	2	1	0	
CO4	2	1	1	1	0	1	1	1	0	
CO5	1	1	1	1	1	1	2	1	0	
Average	2	1	1	1	1	1	3	1	2	

1/1	0.00				L	Τ	Р	SS	C
XB	C60	<b>)3B</b>	IIIIMANI COMPLITED INTEDEACE	-	4	0	0	2	6
C	D		HUMAN COMPUTER INTERFACE			T	D	66	
2	P 0	A		-	L 1	1	P 0	<u>ככ</u> ר	н 6
PR		FOU	ISITE: Fundamentals of Computer		4	U	U	2	0
	11150	e Ou	tromes	D	omai	n	Lev	zel	
Af	ter t	he co	ompletion of the course, students will be able to	2			20		
		Ana	<i>lyze</i> the concepts relating to the design of human						
CC	)1	-com	puter interfaces in ways making computer-	Co	ognit	ive	An	alyze	1
		base	d systems comprehensive, friendly and usable		U			5	
		Und	erstand the theoretical dimensions of human						
CC	)2	facto	ors involved in the acceptance of computer	Co	ognit	ive	Eva	aluate	ŝ
		inter	faces						
CC	)3	Cho	ose the important aspects of implementation of	C	oonit	ive	Ар	ply	
		hum	an-computer interfaces		58110				
CC	04	Iden	tify the various tools and techniques for interface	Co	ognit	ive	Ар	ply	
		anal	ysis, design, and evaluation.						
CC		Iden	tify the impact of usable interfaces in the	Co	ognit	ive	An	alvze	<u>)</u>
	<i>)</i> 5	acce	ptance and performance utilization of		0			5	
TIN	JIT	T						12	
Int	rod	• uctio	n: Historical Evolution of HCL Interactive Sys	tem	n Deg	sion	Co	ncent	t of
Us	abil	itv-T	Definition and Elaboration, HCI and Software Eng	inee	ering	.GU	I De	sign	and
Ae	sthe	etics,	Prototyping Techniques.		0			0	
TIN	JIT	TT	MODEL-BASED DESIGN						12
M	ndel	-Base	ed Design and Evaluation: Basic Idea. Introducti	on	to D	iffer	ent '	Type	s of
Mo	odel	s. G	OMS Family of Models (KLM And CMN -	GOI	MS).	Fitt	s' I	aw a	and
Hi	ckh	ymar	i's Law.		//				
UN	11.1.		GENERAL DEVELOPMENT	,	<b>.</b>	1.0	. 1 1		12
Ge	nera	al De	velopment Guidelines and Principles: Shneiderm		s Eig	ht C	iold(	en Ku	iles,
INC	rma th E	an s s	beven Frinciples, Norman's Model of Interaction,	1N10	eisen	S 16	en п	euris	tics
VV I		хаш	je of its use, contextual inquiry.						
UN	JIT	IV	DIALOG DESIGN						12
Dia	alog	Des	ign: Introduction to Formalism in Dialog Design,	Des	sign	usin	g FS	Μ	
(Fi	nite	State	e Machines), State Charts and (Classical) Petri Ne	ts ir	n Dia	log .	Desi	gn. T	ask
M	odel	ing a	nd Analysis: Hierarchical Task Analysis (HTA), I	ing	ineer	ing	lasi	K	
IVIC	bael	s and	Concur Task Tree (CTT).						
UN	JIT	V	OBJECT ORIENTED MODELLING						12
Ob	ject	Orie	nted Modelling: Object Oriented Principles, Defir	nitic	on of	Clas	ss ar	d Ob	ject
an	d th	eir I	nteractions, Object Oriented Modelling for Use	r Ir	nterfa	ice I	Desi	gn, C	lase
Stu	ıdy	Rela	ted to Mobile Application Development						

LECTURE	TUTORIAL	PRACTICAL	SELF STUDY	TOTAL									
60	0	0	30	60+30									
TEXT BOOK													
1. Dix A., Fi	1. Dix A., Finlay J., Abowd G. D. and Beale R. Human Computer Interaction, 3 rd												
edition, Pe	earson Education, 2	005.											
2. Preece J.,	Rogers Y.,Sharp H.,	Baniyon D., Holland	S. and Carey T. Hu	man Computer									
3. Interaction,Addison-Wesley, 1994.													
4. B.Shneide	<ol> <li>B.Shneiderman; Designing the User Interface, Addison Wesley 2000 (Indian Reprint).</li> </ol>												

# Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

B Sc CS				PO				PSO		
<b>D.5C</b> C5	1	2	3	4	5	6	7	1	2	
CO1	2	1	1	1	1	1	3	1	0	
CO2	2	1	1	1	1	1	1	1	0	
CO3	2	2	1	1	2	2	2	1	0	
CO4	2	1	1	1	0	1	1	1	0	
CO5	1	1	1	1	1	1	2	1	0	
Average	2	1	1	1	1	1	3	1	2	

	_									L	Τ	Р	SS	C	
XB	C60	3C			ПАТ			4	0	0	2	6			
C	Р	Δ			DAI	n n	INALI IICS			Т	Т	р	SS	н	
3	0	0								<b>4</b>	0	0	2	6	
PR	ERI	EQU	ISITI	E: Da	ata Mining										
Со	urse	e Ou	tcom	les	~				D	omai	in	Lev	vel		
Af	ter t	he co	omple	etion	of the cour	se, s	tudents will be	e able to	1			T			
CC	CO1Analyze what constitutes "Artificial" Intelligence and how to identify systems with Artificial IntelligenceCognitiveEvaluate AI methods and whichEvaluate AI methods and whichCognitive														
		Eva	luate				-								
CO	CO2 AI methods may be suited to solving a given											Eva	aluate		
	problem.														
СО	3	<b>Und</b> lang	<i>ersta:</i> juage,	n <b>d</b> /fran	a give nework of c	en diffe	problem i rent AI methoo	n the ds.	Cognitive			Un	dersta	ind	
		Cho	ose a	an alg	gorithm on	naj	problem forma	alization,	С	ogniti	ve	Ар	ply		
CO	4	and	state	te th	e conclusi	ions	that the ev	aluation							
		supp	ports.	•					C	·			1		
СО	5	<i>Reco</i> Intel	o <i>gnize</i> lligen	<i>e</i> th	e limitatio chniques	ons	of current	Artificial	C	ogniti	ve	An	alyze		
UN	JIT	I	INT	ROE	DUCTION				I			12			
Da	ta	Defi	nitior	ns a	nd Analy	sis	Techniques:	Elements	, 1	Varia	bles,	, ar	nd D	)ata	
Ca	tego	oriza	tion,	Level	ls of Measu	rem	ent, Data Mana	agement a	and	Inde	exing	ς.			
UN	JIT	II	DES	SCRI	PTIVE STA	ATI	STICS							12	
De	scri	ptive	e Stat	tistics	s: Measure	es of	f Central Ten	dency, N	lea	sures	of	Loc	ation	. of	
Dis Int	sper rod	sion uctic	s, Err on to I	ror I Proba	Estimation ability	and	Presentation	(Standar	d	Devi	atio	n, V	arian	.ce),	
	JIT	тт	BAG	SIC A	MAIVSIS	TEC	THNIOUES							12	
Bas	sic A	nal	vsis T	echn ⁻	iques: Statig	stica	1 Hypothesis G	eneration	ı ar	nd Te	stind	r Ch	ni-Sau	1are	
Tes	st, T	-Tes	st, An	nalysi	s of Varian	ce, C	Correlation Ana	alysis, Ma	xin	num	Like	liho	od Te	est.	
UN	JIT	IV	DA	TA A	NALYSIS	TEC	HNIQUES-I							12	
Da	ta	Ana	lysis	Tec	hniques-I:	Re	gression Ana	lysis, Cl	ass	ificat	ion	Tec	chniqu	ues,	
Clu	iste	ring	Tecl	hniqu	ies (K-Me	eans,	K-Nearest N	Veighborl	hoc	od).	Da	ata	Anal	ysis	
Techniques-II: Association Rules Analysis, Decision Tree.															
UN	JIT	V	INT	ROE	DUCTION	TO	R PROGRAM	MING						12	
Int	rod	uctic	on to	R	Programmi	ing:	Introduction	to R So	oftv	vare	Тос	ol, S	Statist	ical	
Co	mp	ıtati	ons u	ising	R (Mean, S	tand	lard Deviation,	Variance	e, R	egres	sion	ı, Co	rrelat	tion	
etc	.). P	racti	ce an	ıd An	alysis with	R ai	nd Python Prog	gramming	g, S	ensiti	ivity	r			
An	alys	51S.													
]	LEC	TUF	RE	TU	JTORIAL	]	PRACTICAL	SELF S	ΤU	DY		TC	TAL		
		60			0		0	3	0			6	)+30		

## TEXT BOOK

1. Probability and statistics for Engineers and Scientists (9 Edn.), Ronald E Walppole, Raymond H Myres, Sharon L. Myres and Leying Ye, Prentice Hall Inc

2. The Elements of Statistical Learning, Data Mining, Inference, and Prediction (2nd Edn.) Travor Hastie Robert Tibshirani Jerome Friedman, Springer, 2014

#### **REFERENCES:**

1. Software for Data Analysis: Programming with R (Statistics and Computing), John M. Chambers, Springer

P Se				PO				PS	<b>50</b>
D.5C.	1	2	3	4	5	6	7	1	2
CO1	3	2	1	1	0	1	0	1	1
CO2	0	1	3	2	0	2	0	2	2
CO3	1	2	3	0	0	2	0	2	2
CO4	1	2	3	1	0	2	0	1	2
CO5	0	3	0	1	0	2	0	1	2
Average	1	2	2	1	0	2	0	1	2

#### Mapping of Course Outcomes (CO) with Programme Outcomes (PO):

Course	Course Name	PLO									
Туре		Α	B	C	D	Ε	F	G	Η	Ι	J
CC-1A	Programming	Ι	Ι	-	Ι	-	-	Ι	-	Ι	-
	Methodology										
CC-2A	Data Structures	R	-	-	R	-	Ι	Ι	-	-	-
CC-3A	Operating System	R	Ι	-	-	Ι	-	Ι	Ι	-	-
CC-4A	Database	-	R	-	Μ	-	Ι	R	Ι	Ι	Ι
	Management										
	System										
	Software	Μ	R	-	Ι	Ι	R	Ι	Ι	-	-
	Engineering										
DSE-1A	Computer Ethics	-	-	-	-	Ι	Ι	-	-	Ι	-
Any	Computer	Ι	Ι	-	-	-	Ι	-	Ι	-	-
One	Organization										
	&Architecture										
	Computer	-	Μ	Ι	-	R	R	Ι	R	-	Ι
	Networks										
DSE-2A	Data Mining	Μ	-	-	Μ	-	R	Μ	-	-	R
Any	Internet of Thing	-	Ι	-	Μ	R	Μ	R	R	-	R
One	Artificial	Μ	-	Ι	-	-	Μ	R	-	R	R
	Intelligence										
	Computer	Μ	Μ	-	-	-	Ι	-	-	-	R
	Graphics										
SEC-3A	MAT LAB	R	Μ	-	R	-	R	Ι			
Any one	Programming										
	Programming in	R	Μ	-	R	-	R	Ι	-	-	-
	Java										
	Python	R	Μ	-	R	-	R	Ι			
	Programming										
SEC-4A	Web	R	Ι	-	-	М	R	-	R	Ι	R
Any one	Programming										
-	Mobile	-	Ι	Ι	М	R	Μ	Μ	-	-	Ι
	Application										
	Development										
	Cloud Computing	-	R	Ι	Μ	R	Μ	Μ	-	-	Ι

# Curriculum Alignment Matrix

# **Guidelines for UG Engineering & Technology Curriculum 2020-21**

# Curriculum Structure for B.Sc. Computer Science (Full time) Degree Programmes offered by PMIST

#### I SEMESTER

Category	Course Name			Cre	edits		Hours					
		L	Τ	Р	SS	Total	L	Τ	Р	SS	Total	
AECC1	Communication	2	0	0	0	2	2	0	0	2	2+2	
ALCC I	Skills in English											
	Ariviyal Tamil/	2	0	0	0	2	2	0	0	0	2	
AECC 2	Comprehensive											
	English											
CC-1A	Programming	3	1	1	1	6	3	1	3	1	7+1	
	Methodologies											
CC-1B	Algebra, Calculus &	4	1	0	1	6	4	1	0	1	5+1	
	Analytical Geometry											
CC-1C	Computer	3	1	1	1	6	3	1	3	1	7+1	
	Fundamentals											
UMAN-1	Human Ethics,	0	0	0	0	0	2	0	0	1	2+1	
	Values, Rights, and											
	Gender Equality											
	Total	14	3	2	3	22	16	3	6	6	25+6	

## **II SEMESTER**

Category	Course Name			Cre	edits				Ho	ours	
		L	Τ	Р	SS	Total	L	Τ	Р	SS	Total
AECC 3	English for Effective	2	0	0	0	2	2	0	0	2	2+2
	Communication										
AECC 4	Environmental Studies	2	0	0	0	2	2	0	0	1	2+1
CC-2A	Data Structures	3	1	1	1	6	3	1	3	1	7+1
CC-2B	Discrete Mathematics	3	1	0	2	6	3	1	0	2	4+2
CC- 2C	Digital Electronics	3	1	1	1	6	3	1	3	1	7+1
UMAN-2	Disaster Management	0	0	0	0	0	3	0	0	0	3
	Total	13	3	2	4	22	16	3	6	7	25+7

### **III SEMESTER**

Category	Course		lits		Hours						
	Name	L	Τ	P	SS	Total	L	Т	Р	SS	Total
SEC-1B	Multimedia	3	0	1	0	4	3	0	2	0	5
	Systems										
CC- 3A	Operating	4	1	0	1	6	4	1	0	1	5+1
	System										
CC- 3B	Algorithms	3	1	1	1	6	3	1	3	1	7+1
CC- 3C	Allied Physics	4	1	0	1	6	4	1	0	1	5+1
GE-1	*Open Elective	3	0	0	0	3	3	0	0	0	3
	- To be chosen										
	by student										
Minor	R	1	0	0	0	1*	1	0	0	0	1
Course	Programming										
* Extra											
Credit											
	Total										
		17+1	3	2	3	25+1*	17+1	3	5	3	25+3+1

# **IV SEMESTER**

Categor	Course Name	Credits					Hours						
у		L	Τ	Р	SS	Total	L	Τ	Р	SS	Total		
SEC-2B	Object	3	0	1	0	4	3	0	2	0	5		
	Oriented												
	Programming												
CC - 4A	Database	3	1	1	1	6	3	1	3	1	7+1		
	Management												
	Systems												
CC - 4B	Statistics	4	1	0	1	6	4	1	0	1	5+1		
CC - 4C	Principles of	4	1	0	1	6	4	1	0	1	5+1		
	Management												
GE-2	*Open Elective	3	0	0	0	3	3	0	0	0	3		
	- To be chosen												
	by student												
Minor	Angular JS	1	0	0	0	1*	1	0	0	0	1		
Course													
*Extra													
Credit													
	Total	17					17						
		+1	3	2	3	25+1*	+1	3	5	3	25+3+1		

## **V SEMESTER**

Category	Course Name		lits		Hours						
		L	Т	Р	SS	Tota	L	Т	Р	SS	Total
SEC 2A	ΜΑΤΙΑΡ	2	0	1	0		2	0	2	0	E
SEC-SA	Programming	3	0	T	0	4	5	0	2	0	5
	Programming	3	0	1	0	4	3	0	2	0	5
	in Java	0	Ŭ	-	Ū	-	U	Ŭ	-	Ŭ	U
	Python	3	0	1	0	4	3	0	2	0	5
	Programming										
DSE-1A	Software	4	2	0	0	6	4	2	0	0	6
	Engineering										
	Computer	4	2	0	0	6	4	2	0	0	6
	Ethics										
	Computer	4	2	0	0	6	4	2	0	0	6
	Organization &										
	Architecture	4	2	0	0		4	2	0	0	(
	Networks	4	2	0	0	6	4	2	0	0	6
DSE-1B	NET	3	2	1	0	6	3	2	3	0	8
DOL 1D	Technologies	5	~		0	0	5	~	5	0	0
	GIMP (GNU	3	2	1	0	6	3	2	3	0	8
	Image	0	~	1	U	0	0	~	5	U	0
	Manipulation										
	Program)										
	Theory of	3	2	1	0	6	3	2	3	0	8
	Computation	0	-	-	Ū	Ŭ	0	-	0	Ŭ	Ũ
DEF 10	t	4	_	0	0		4	0	0	0	(
DSE-IC	Image	4	2	0	0	6	4	2	0	0	6
	Processing	4	_	0	0		4	0	0	0	(
	Internet	4	2	0	0	6	4	2	0	0	6
	Technologies	4	_	0	0		4	0	0	0	(
	System	4	2	0	0	6	4	2	0	0	6
	Security	0	0	0	0		0	0	0	0	0
	IPT 21 Days	0	0	0	0	2	0	0	0	0	0
		11	ſ	•		04	11		-	0	25
		14	6	2	U	24	14	6	5	U	25

### VI SEMESTER

Catego	Course Name	Credits Hours									
ry		L	Т	Р	SS	Tota 1	L	Τ	Р	SS	Total
SEC-4A	Web Technologies	3	0	1	0	4	3	0	2	0	5
	Mobile Application Development	3	0	1	0	4	3	0	2	0	5
	Cloud Computing	3	0	1	0	4	3	0	2	0	5
DSE-2A	Internet of Things	4	0	0	2	6	4	0	0	2	4+2
	Data Mining	4	0	0	2	6	4	0	0	2	4+2
	Artificial Intelligence	4	0	0	2	6	4	0	0	2	4+2
	Computer Graphics	4	0	0	2	6	4	0	0	2	4+2
DSE-2B	Machine Learning	4	0	0	2	6	4	0	0	2	4+2
	Human Computer Interface	4	0	0	2	6	4	0	0	2	4+2
	Data Analytics	4	0	0	2	6	4	0	0	2	4+2
DSE-2C	Project Work	0	0	6	0	6	0	0	12	0	12
		11	0	7	4	22	11	0	14	4	25+4

# Summary of the credits and hours

Semester	Total	Total Hours /	No. of courses
	Credits	Week	
I	22	25+6	6
II	22	25+7	6
III	25+1*	25+4	6
IV	25+1*	25+4	6
V	24	25	4
VI	22	25+4	4
Total	142	150+25	32

# The salient features of this curriculum are as follows.

- 1. For all B.Sc(CS). Programmes 132 credits is mandatory.
- 2. The average load per semester is about 22 credits.
- 3. The main Project is in the 6th Semester.
- 4. The credit distribution is followed as per the guidelines given by AICTE/UGC

Course type			Cre	dits		Contact Hours				
		Τ	Р	SS	Total	L	Τ	Р	SS	Total
Lecture course	2	0	0	0	2	2	0	0	2	4
Lecture + practical course	3	0	1	0	4	3	0	2	0	5
Locture + Tutorial course	4	2	0	0	6	4	2	0	0	6
	4	1	0	1	6	4	1	0	1	6
Lecture + Tutorial + practical	3	1	1	1	6	3	1	3	1	8
course										

# Note:

1. Evaluation and Assessment must be done for all non credit courses.

2. The course teacher should maintain records for assessment of Self Study (SS).