## CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK

## B.Sc IT:

## Those who have joined in the Academic year 2023-24 onwards

## Programme outcomes (PO) for B.Sc Information Technology

- Scientific aptitude will be developed in Students
- Students will acquire basic Practical skills & Technical knowledge along with domain knowledge of different subjects in the science & humanities stream.
- Students will become employable; Students will be eligible for career opportunities in education field, Industry, or will be able to opt for entrepreneurship
- Students will possess basic subject knowledge required for higher studies, professional and applied courses
- Students will be aware of and able to develop solution oriented approach towards various Social and Environmental issues.
- Ability to acquire in-depth knowledge of several branches of Mathematics and aligned areas. This Programme helps learners in building a solid foundation for higher studies in Mathematics
- The skills and knowledge gained leads to proficiency in analytical reasoning, which can be utilized in modeling and solving real life problems.
- Utilize mathematics to solve theoretical and applied problems by critical understanding, analysis and synthesis.
- > To recognize patterns and to identify essential and relevant aspects of problems.
- Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others.
- > Mould the students into responsible citizens in a rapidly changing interdependent society.

The above expectations generally can be pooled into 6 broad categories and can be modified according to institutional requirements:

- PO1: Knowledge
- PO2: Problem Analysis
- PO3: Design / Development of Solutions
- PO4: Conduct investigations of complex problems
- PO5: Modern tool usage
- PO6: Applying to society

## Programme Specific Outcomes of B.ScDegree programme in Information Technology

- **PSO1** Demonstrate and apply basic knowledge of information technology to the scientific issues and problems being faced in society and the industry.
- **PSO2** Analyze critical problems and provide computer-based solutions by applying appropriate tools and technology.
- **PSO3** Design and develop solutions to problems in the areas related to web page design, Mobile App development, cloud computing, IOT and data analytics of varying complexity.

## CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK B.Sc Information Technology

Part	Courses	Subject	Code	Cr.	Hrs
		SEMESTER - I			1
Ι	Lang. – I	nghJj;jkpo; - I	230103101	3	6
II	Lang II	General English	231003101	3	4
	CC – 1	C Programming	232603101	5	5
III	CC – 2	C- Programming Lab	232603102	3	5
	EC – I Theory	Digital Logic Fundamentals	232603103	2	2
	EC-I Practical	Digital Logic Fundamentals Lab	232603104	1	2
IV	SEC –I(NME)	Fundamentals of IT	234603126	2	2
IV/	FC	Problem Solving Techniques	234403126	2	2
1 V	AECC	Soft Skill – I	236003101	2	2
	Total			23	30
		SEMESTER II			
Ι	LangI	nghJj;jkpo; - II	230103201	3	6
II	LangII	General English	231003201	3	4
	CC – 3	Java Programming	232603201	4	5
III	CC - 4	Java Practical	232603202	4	5
	EC– II	Software Engineering	232603203	3	4
IV	SEC-II (NME)	Multimedia	234603226	2	2
	SEC - III	Quantitative Aptitude	234403226	2	2
	AECC –II	Soft Skill - II	236003201	2	2
				23	30
		SEMESTER III			
Ι	LangI	nghJj;jkpo; - III	230103301	3	6
II	LangII	General English	231003301	3	4
	CC – 5	Web Application Development	232603301	4	5
III	CC - 6	Web Practical	232603302	4	5
	EC –3	Data Structures and Algorithms	232603303	3	4
	SEC –IV	Entrepreneurial Based	234403326	1	1
•	SEC – V	R- Programming Practical	238203326	2	2
.IV	AECC – III	Soft Skill - III	236003301	2	2
	EVS	Environmental Studies	234103301	1	1
				23	30

Part	Courses		Code	Cr.	Hrs
		SEMESTER IV			<u> </u>
Ι	Lang. – I	nghJj;jkpo; - <b>IV</b>	230103101	3	6
II	Lang II	General English	231003101	3	4
	CC – 7	Industry Module – Industrial Statistics	232603401	4	5
	CC - 8	Operating Systme	232603402	4	4
111	EC – IV	Python Programming – Theory and Practical	232603403	3	4
IV	SEC –VI	Internet of Things	234403426	2	2
117	SEC –VII	Cloud Computing	238203426	2	2
IV	AECC	Soft Skill - IV	236003401	2	2
	EVS	Environmental Studies	234103401	1	1
	Total			24	30
		SEMESTER V			-
	CC – 9	Computer Networks	232603501	4	5
	CC - 10	Database Management System	232603502	4	5
	CC - 11	Database Lab	232603503	4	5
ш	Core 12	Project with Viva Voce	232603504	4	4
111	FC – V	1. Elective V			
	LC V	2.			
	EC – VI	1. Elective VI			
		Value Education	234303501	1	1
IV		Internship/Industrial Training(carried out	222602500	2	
		in II year summer vacation)30 hrs	232603509	2	
				25	30
		SEMESTER VI			
	CC – 13	Machine Learning	232603601	4	5
	CC – 14	Data Analytics	232603602	4	5
	CC – 15	Android Programming Theory and Practical	232603603	4	5
111	FG 7	1. PHP Practical		2	_
	EC -/	2.		3	5
		1. Fuzzy Logic		2	_
	EC - 8	2.		3	5
IV	Processional competency skill enhancement course	Professional Competency Skill	234403626	2	4
		Value Education	234303601	1	1
V		Extension Activity (outside college hrs)	232603608	1	
				22	30

Title of the CourseC Programming												
Category		Year	Ι	Credits	5	(	Course	2	32603101			
		Semester	Ι	Cicuits			Code	4	52005101			
Instructi	onal Hours	Lecture	Tutorial	Lab Practice	Total	CIA	<b>Extern</b>	nal	Total			
per week	5 5						75		100			
		]	Learning	g Objective	S							
LO1	To learn and und	erstand the	basics pr	ogram struc	ture of <b>(</b>	2.						
LO2	To learn the prog	o learn the programming principles of the looping and the statements.										
LO3	To understand the	o understand the functions used in arrays and string functions.										
LO4	To recall the met	hods of stru	ictures ar	nd union to i	impleme	ent in	arrays.					
LO5	To study the defin To analyze the fil	nition of po le to access	ointers an sing diffe	d the initialities of the tent method	izing the ls.	e poin	nters.					
UNIT			Deta	ils				Р	No. of eriods for the Unit			
Ι	<b>Overview of C</b> : structure, executi Character set, C data types, decla Assignment state Operators and E:	Impor ing C progr tokens, key aration of ement, decl xpressions	tance of cam. Con words ar variable aring a Managir	C, sample ( stants, Vari nd identifier s, Assigning variable as ng Input and	C progra ables, an s, consta g values constan l Output	am, C nd Da ants, 5 to nt, a. 6 Ope	C program ata Types. variables variables s volatile. rations.		15			
п	Decision Making IF ELSE, nested Decision Making	g and Bran IF ELSE , and Loopi	ching: I ELSE IF ng: While	Decision ma Fladder, sw e, Do-While	king wit itch, GC e, For, Ju	h If, DTO a umps	simple IF statement in loops.		15			
III	Arrays: De arrays, initiali arrays.Functions calling a function functions with ar character arrays	eclaration zing two : The form 1, categorie rays, call b and string	and acce dimension of C fu s of func by value, functions	essing of o onal arra nctions, Re tions, Neste call by refe	ne & tv ys, mi turn val d functio rence, si	vo-di ultidi lues d ons, l torag	mensiona mensiona and types Recursion ge classes	!	15			
IV	<b>Structures and Unions:</b> Defining, giving values to members, initialization and comparison of structure variables, arrays of structure, arrays within structures, structures within structures, structures and functions, unions. Preprocessors: Macro substitution, file inclusion.											
V	<b>Pointers:</b> definit variable through pointer incremen functions, pointe closing and I/O line arguments.	tion, declar address a ts and scal ors and stru operations	ring and and throu e factor, actures. <b>F</b> i on files,	initializing ugh pointer pointers ar <b>ile Manage</b> random acc	pointer , pointe nd arrays ement in cess to f	rs, ac er ex s, po n C: ïles,	ccessing a pressions inters and Opening command	L , , ,	15			

	Course Outcomes								
Course Outcomes	On completion of this course, students will be able;								
CO1	Remember the program structure of C with its syntax and semantics								
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)								
CO3	Apply the programming principles learnt in real-time problems								
CO4	Analyze the various methods of solving a problem and choose the best method								
CO5	Code, debug and test the programs with appropriate test cases								

	Text Books (Latest Editions)							
1	E. Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-Hill, 2010							
2	Yashavant, Kanetkar. Let us C, BPB Publications, 2021.							
	References Books							
	(Latest editions, and the style as given below must be strictly adhered to)							
1	Byron Gottfried, Schaum's Outline Programming with C, Fourth Edition, Tata McGraw-Hill, 2018.							
2	Kernighan and Ritchie, The C Programming Language, Second Edition, Prentice Hall, 1998.							
3	Schildt, Herbert. "C The Complete Reference." (2021).							
	Web Resources							
1	https://www.geeksforgeeks.org/c-programming-language							
2	https://www.w3schools.in/C							
3	https://www.tutorialspoint.com/cprogramming							

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	S	S	S	S	S	S
CO2	S	S	S	S	S	S
CO3	М	М	S	М	М	S
CO4	S	S	S	S	S	М
CO5	S	S	S	S	М	S

Title of t	he Course	C Progra	mming I	Lab						
Catalan		Year	Ι	Care ditta	2	C	ourse	2	22(02102	
		Semester	Ι	Credits	3	C	ode	Z	32603102	
Instructi	onal Hours	Lecture	Tutorial	Lab Practice	Total	CIA	Extern	al	Total	
per week	<b>Z</b>	-	_	5	5	25	75		100	
		]	Learning	g Objective	s					
LO1	To understand th	e basic synt	ax, data	types and or	perators	in C.				
LO2	To learn the concepts of decision making statements.									
LO3	Analyze the conc	epts of Arr	ays, Func	ctions and S	trings.					
104			•	11.00						
LO4	Describing the st	ructure of p	ointers u	sing differe	nt fields.	•				
LO5	To avaluate the a	no onome form	the maint	and file		41- 0 1	a4		-	
LUS	To evaluate the p	rogram for	the point	ers and mes	s used in	i the li	st.			
									No. of	
			Deta	ils				Р	Periods for	
UNII			Deta	115					the Unit	
Ι	Variables Data	types Con	stants a	nd Operato	rc					
	variables, Data	types, con	istants a		15					
	1.Evaluation of e	xpression e	x: ((x+y)	$^{2} * (x+z)$	)/W					
	2.Temperature co	onversion p	roblem (I	Fahrenheit t	o Celsiu	s)				
	3.Program to con	vert davs to	o months	and davs (E	Ex: 364 c	lavs =	12			
	months and 4 day	/s)				J				
	4 Solution of qua	dratic equa	tion							
	5.Salesman salar	v (Given: B	asic Sala	ry, Bonus fe	or every	item s	sold.			
	commission on th	ne total mor	nthly sale	s)	5		,			
II	Decision making	g Statemen	ts							
	6.Maximum of th	ree number	rs							
	7.Calculate Squa	re root of fi	ve numb	ers (using g	oto state	ment)				
	8.Pay-Bill Calcul	ation for di	merent le	evels of emp	loyee (S	witch				
	9 Fibonacci ser	ies								
	10. Floyds Trians	zle								
	11.Pascal's Trian	gl								
III	Arrays, Functio	ns and Stri	ings							
	12.Prime number	rs in an arra	у							
	13.Sorting data (	Ascending	and Desc	ending)						
	14.Matrix Additi	on and Sub	traction							
	15. Matrix Multip	no argume	nte and n	o return val	1166					
	17 Function that	convert low	ver case l	effers to upr	oer case					
	18. Factorial usin	g recursion	l.		for cuse					
	19.Perform String	g Operation	is using S	witch Case						
IV	Structures and I	Macros								
	20.Structure that	describes a	Hotel (n	ame, addres	s, grade	, avg 1	room rent	,		
	number of rooms	) Perform s	ome oper	rations (list	of hotels	s of a g	given			
	grade etc.)	in 64	1400							
	21. Using Pointer	is in Structi	ires.							
	23. Write a macro	that calcul	ates the r	nax and mir	1 of two	ուլահ	ers			
	24.Nested macro	to calculate	e Cube of	f a number.						

V	Po	inters and Files							
	25. Evaluation of Pointer expressions								
	26.Function to exchange two pointer values								
27. Creation, insertion and deletion in a linked list									
	28.Program to read a file and print the data.								
	29.	Program to receive a file name and a line of text as command line							
	arg	uments and write the text to the file							
	30.	Program to copy the content of one file to another file.							
		Course Outcomes							
Cour Outcor	se nes	On completion of this course, students will be able;							
CO	L	Remember and understand how to write programs using the basic syn semantics in C	ntax and						
CO2	2	Apply the concepts of functions, macros, arrays, structures, pointe programs to solve problems	ers and files in						
COS	3	Analyze and understand programs written in C language							
CO <sup>2</sup>	l I	Evaluate the program execution flow with test cases and apply debug	ging						
COS	5	Design algorithms and write programs in C language for the given pr	oblems.						
		Text Books (Latest Editions)							
1	E. F	Balagurusamy, Programming in ANSI C, Fifth Edition, Tata McGraw-	Hill, 2010.						
2	Ren	nmaThareja,Programming in C,second edition, Oxford university press	8						
		<b>References Books</b>							
	(I	atest editions, and the style as given below must be strictly adhered	d to)						
	Byr	on Gottfried, Schaum's Outline Programming with C, Fourth	Edition, Tata						
1	Mc	Graw-Hill, 2018.							
	Ker	nighan and Ritchie, The C Programming Language, Second Edition,	Prentice Hall,						
2	100	0							
	199	0.							
3	Yas	havant Kanetkar, Let Us C, Eighteenth Edition, BPB Publications, 202	21						
		Web Resources							
1	http	s://www.tutorialspoint.com/cprogramming							
2	http	s://www.javatpoint.com/c-programming-language-tutorial							
3	http	s://www.w3schools.in/category/c-tutorial							

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	PO 4	<b>PO 5</b>	<b>PO 6</b>
CO1	S	S	S	S	S	S
CO2	S	S	S	S	Μ	S
CO3	S	S	S	Μ	S	S
CO4	S	М	S	М	S	М
CO5	S	S	S	S	Μ	S

Title of the Course Digital Logic Fundamentals													
Categor	y EC – I Theory	Year Semester	I I	Credits	2		Course Code	2	32603103				
Instruct	tional Hours	Lecture	Tutorial	Lab Practice	Total	CIA	Extern	nal	Total				
per wee	K	2	-		2	25	75		100				
	Learning Objectives												
LO1	To understand the	e basic num	ber syste	ems									
	To gain the know	To gain the knowledge on sequential circuits											
	Understand com	Jnderstand combinatorial circuits											
LO4 LO5	To apply in desig	n of circuit	s										
UNIT		<u> </u>	Deta	ils				No fe	o. of Periods or the Unit				
	Binary Systems	: Digital	Compute	ers and D	igital S	Syster	ns-Binary	/					
т	Numbers-Numbe	r base Con	version-(	Octal and H	Iexa dec	cimal	numbers	-	6				
-	Complements-Bi	narv codes-	Binary lo	ogic.					Ū				
	Boolean Algebr	and L		es: Basic	definiti	ions_	Aviomatic						
	definition of D	a and La	ohno Da	usic theorem	ma and	10113-1		c					
п		Dolean alg	еога - Ба	asic theorem		pro	perties 0.		6				
	Boolean algebra	a-Digital I	ogic ga	tes. Simpl	ification	n of	Boolear	1	-				
	function: The Ma	p method-U	Upto five	variables.									
	Combinational	logic:	Introduc	tion-Design	n proo	cedur	e-Adders	-					
III	Subtractors. Com		6										
	logic with MSI a	nd LSI: Dec	coders-M	lultiplexers.									
	Sequential logic	: Introduc	tion-Flip	-Flops-Trig	gering	of F	lip-Flops	-					
	Design of Cou	nters. Reg	isters, C	Counters ar	nd the	mem	ory unit						
IV	Introduction-Reg	isters-Shift	register	rs- ripple	counter	rs-Sy	nchronous	5	6				
	counters.		-			-							
	Processor Logic	Design:	Design	of Arithm	etic log	gic u	nit-Status	3					
V	register-Design o	f Accumul:	ator		Ĺ				6				
			Course	Outcomes									
Cours	e	On com	nletion of	f this course	studen	te wil	l be able:						
Outcom	ies				, studen								
CO1	Understand th	ne fundame	ntal conc	epts and tec	chniques	of d	igital logi	с.					
CO2	Apply arithm	etic operati	ons in nu	imber syster	n and va	arious	s methods	to					
02	implement si	implificatio	n of Boo	lean functio	ns.								
CO3	Analyze the c	lesign of va	rious coi	nbinational	and seq	uenti	al circuits	•					
CU1	Ability to ide	ntify requir	ements fo	or a design	applicati	ion us	sing logic	gat	æs,				
04	combinational and sequential circuits.												
CO5	Build a digita	ll circuit usi	ing the de	esign procec	lure.								
1	Logic and comput	Tex er design fi	t Books ( indament	(Latest Edit tals MMM	tions) Iano 5 <sup>th</sup>	<sup>1</sup> Edit	ion 2016	PH	1				
1	T C Bartan 1007	Computor	Architact	ure and loc:	c design	Int.	rnational	, 1	•				
2	Edition Mc Graw	Hill		ure and logi	<u>e desigli</u>	<u>i</u> , 11100	anational						
	Lanon, me Oraw												

	References Books									
	(Latest editions, and the style as given below must be strictly adhered to)									
1	John.M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.									
2	Charles H.Roth. Fundamentals of Logic Design, Thomson Learning, 2003.									
	Web Resources									
1	www.asic-Worl.com/digital/tutorial.html									
2	https://course.ie.cuhk.edu.hk/~ieg2810//Lab_tutorial1_08.pdf									

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO1	М	S	М	S	М	S
CO2	S	S	L	S	S	S
CO3	L	М	S	L	М	М
CO4	S	М	L	М	L	L
CO5	М	S	S	S	S	S

Title of	the Course	Digital L	ogic Fund	damentals I	Lab					
Categor	$\mathbf{y} = \frac{\mathbf{E}\mathbf{C} - \mathbf{I}}{\mathbf{P}_{rotical}}$	Year	I I	Credits	1	Co	ourse	2320	50310	)4
Instruct	ional Hours	Lecture	Tutorial	Lab	Total	CIA	Extern	al	Tota	1
per wee	K	-		Practice 2	2	25	75	-	100	
To realiz	a the digital prin	ciples by d	Learning	g Objectives	s	ite nei	na integ	rated	phine	and
discrete c	omponents and als	so examine	their action	on by verify	ing truth	n tables			mps	anu
1. In	plementation of (	DR, NOT, I	NOR, gate	es using disc	rete con	nponen	ts.			
2. In	plementation of A	AND, NOT	', NAND §	gates using o	liscrete	compo	nents.			
3. U	niversality of NAM	ND gates us	sing IC 74	-00						
4. U	niversality of NOF	R gates usir	ng IC 7402	2						
5. R	S Flip Flop using I	NOR gate.								
6. R	S Flip Flop using	NAND gat	te.							
7. E	k-OR gate using N	OR gate.								
8. E	x-OR gate using N	IAND gate								
9. V	erification of DeM	lorgan's th	eorems.							
10. H	alf adder & Full ad	dder using	IC's							
11. B	inary to gray code	converter.								
12. H	alf Subtractor & I	Full Subtra	ctor using	IC's						
13. A	stable multivibrate	or using IC	555 timer							
14. M	onostable multivil	brator using	g IC 555 t	imer.						
15. So	chmitt trigger using	g IC 555 ti	mer.							
16. 1	of 4 decoder using	g IC's.								
17. JH	K Flip Flop using	IC 7473.								
18. D	Flip Flop using IC	C's								
19. Pa	arity generator usin	ng IC 7486								
20.4	of 1 multiplexer u	sing IC's								
REFERI	ENCE:									
1. B	Paton, Fundamen	ntal of Digi	tal Electro	onics Lab, 19	998 Edit	ion, Na	ational Ir	nstrume	ent	
C	orporation, 6504 E	Bridge Poin	t Parkway	, Austin.						
2. A	lbert Paul Malvin	o Donald	P. Leech,	Digital Pri	nciples	and Ap	plication	ns, VI	Edit	ion.
20	)12, TATA McGra	aw – Hill, N	New Delhi	i.						

Title of t	he Course	NME – F	undame	ntals of IT						
Categor	y SEC – I NME	Year Semester	I	Credits	2	C	ourse ode	234603126		
Instruct	ional Hours	Lecture	Tutorial	Lab Prostico	Total	CIA	Extern	al Total		
per weel	K	2	-		2	25	75	100		
	-		Learning	g Objective	S					
	This course is informational communication	designed technolog in today's	to pr y and s society	ovide stu essential	dents skills	with neces	basic sary fo	concepts of or work and		
	To understand output devices,	the basi Internet,	cs of co World W	mputers, ( ide Web, a	Comput nd Elec	er arc tronic	hitectu Mail.	re, input and		
UNIT		Details No. Details Period the								
Ι	Generation of M Systems: Microo Computers – Net	Generation of Modern Computers – Classification of Digital Computer         Systems: Microcomputers - Minicomputers - Mainframes – Super         Computers – Network Computers								
п	Anatomy of a D CPU – Memory -	igital Com - Input dev	puter: Pa ices – out	rts of a Control o	mputer – storag	–Proce ge devi	ssor (or) ces.	6		
III	Input Devices: K OMR. Output de	nput Devices: Keyboard-Mouse-Scanners-Barcode Reader- Webcams- OMR. Output devices: Monitor-Printer. 6								
IV	Computer Networks: Introduction-Types of networks-Network Topology. Internet &World Wide Web: Introduction-What is special about the internet?-Internet Access.									
V	Overview of Electronic Mail: Introduction- How E-mail Works?-Why Use E-mail-E-mail-Names and Addresses-Mailing Basics. Introduction to Intranets: Introduction-Characteristics of Intranet-Advantages of Intranets.							6		
			Course	Outcomes						
Course Outcom	es	On com	pletion o	f this course	e, studen	ts will	be able;			
CO1	Gain the func	lamental kı	nowledge	of different	t types o	f comp	outers.			
CO2	Gain the kno Technology s	owledge of so as to ena	differen ble stude	t parts of c nts to impro	compute ove their	r and skills,	the use knowled	of Information lge.		
CO3	Develop the enabled servi	ability to le ces and fur	earn vario	ous input an	nd outpu	t devic	es for	utilization of IT		
CO4	Illustrate vari	ous IT web	services	for betterm	ent of k	nowled	lge.			
CO5	Understand in	mportance	of EMA	L and its se	ervices a	nd cha	llenges f	or the same.		

			Text	Books	(Latest Editions)	)			
Alexis	Leon	and	Mathews	Leon,	"Fundamentals	of	information	Technology	$2^{nd}$
Edition	" L&L	Con	sultancy se	rvices l	PVT LTD., India				

	<b>References Books</b>
	(Latest editions, and the style as given below must be strictly adhered to)
01.	RajaRaman V., Fundamentals of Computers, 4 <sup>th</sup> Edition, Prentice – Hall of India, New
	Delhi, 1999.
02.	"Fundamentals of Information Technology-Research Gate (PDF), Edition 1, ISBN:978-
	330-80532-3, Noor Publication.
03.	"Introduction to Information Technology" – O'Reilly, 2 <sup>nd</sup> Edition India,
	ISBN:9789332525146 by ITL Limited ITL education Solution Limited.
	Web Resources
01.	https://www.webopedia.com/TERM/P/programming_language.html
02.	https://codescracker.com/computer-fundamental/types-of-computer-languages.htm
03.	https://www.tutorialspoint.com/internet_technologies/e_mail_working.htm
04.	https://www.howtogeek.com/56002/htg-explains-how-does-email-work/
05.	https://www.interserver.net/tips/kb/exactly-emails-works-steps-explanation/

	<b>PO 1</b>	PO 2	PO 3	PO 4	<b>PO 5</b>
CO1	3	3	3	2	1
CO2	3	3	3	3	1
CO3	3	3	3	2	2
CO4	3	3	2	2	3
CO5	3	3	2	2	3

Mapping with Programme Outcomes:

Title of t	he Course	Problem	Solving 7	<b>Fechniques</b>						
Category	FC	Year Semeste	I r I	Credits	2		ourse ode	234403126		
Instructi	onal Hours	Lecture	Tutorial	Lab Practice	Externa	al Total				
per week	·	2	_		2	25	75	100		
To facilitation fa	Fo facilitate an exposure to a variety of ways to solve fundamental computing problems and an appreciation of how some ways are developed that are more efficient than others.									
			Learning	g Objective	S					
• To	understand the in	nportance	of algorit	hms and pro	ograms standar	d probl	ems			
• 10	learn ennerent su	lategies al			standar		CIIIS	No. of		
UNIT				Periods for the Unit						
Ι	Introduction: N solving problems definition phase, examples, Simila solution – Gener top-down design Recursion.	oduction: Notion of algorithms and programs – Requirements for ng problems by computer – The problem-solving aspect: Problem nition phase, Getting started on a problem, The use of specific uples, Similarities among problems, Working backwards from the tion – General problem-solving strategies - Problem solving using down design – Implementation of algorithms – The concept of ursion.6								
Π	Fundamental A Counting - Sumi Sine function co the digits of an in	adamental Algorithms: Exchanging the values of two variables – unting - Summation of a set of numbers - Factorial computation - e function computation - Fibonacci Series generation - Reversing digits of an integer – Base Conversion.6								
III	Factoring Meth smallest divisor integers - Genera an integer – Gener to a large power -	ctoring Methods: Finding the square root of a number – The hallest divisor of an integer – Greatest common divisor of two egers - Generating prime numbers – Computing the prime factors of integer – Generation of pseudo-random numbers - Raising a number a large power – Computing the <i>n</i> th Fibonacci number.6								
IV	Array Techniq histogramming – duplicates from a smallest element	<b>tray Techniques</b> : Array order reversal – Array counting or stogramming – Finding the maximum number in a set - Removal of plicates from an ordered array - Partitioning an array – Finding the $k^{h}$ for allest element – Longest monotone subsequence.								
V	<b>Text Processing</b> – Left and right j line editing – Lin Hanoi – Permutat	and Patt ustificatio near patter tion genera	ern Searc n of text – rn search.l ation.	ching: Text Keyword s Recursive	line len searching algorith	gth ad g in tex <b>ms</b> : To	justment kt – Text owers of	6		
			Course	Outcomes				·		
Course Outcome	es	On cor	npletion of	f this course	e, studen	ts will	be able;			
<b>CO1</b>	Understandin	g basic sy	stematic a	pproach to	problem	solvin	g.			
CO2	Learn the app	broach and	algorithm	$rac{1}{1}$ solve s	pecific f	undam	ental pro	blems.		
CO3	Studying the	efficient a	pproach to	solve spec	ific facto	oring-r	elated pro	oblems.		
CO4	To know the	efficient a	rray-relate	d technique	es to solv	ve spec	ific probl	ems.		
CO5	Understand processing an	the efficient of the efficient of the efficient of the efficiency	ent metho sursion wo	ods to solv rks.	ve speci	ific pr	oblems 1	related to text		

	Text Books (Latest Editions)						
	1. R. G. Dromey, <i>How to Solve it by Computer</i> , Pearson India, 2007.						
	References Books						
	(Latest editions, and the style as given below must be strictly adhered to)						
1	1. Wiley's TCS National Qualifier Test Study Guide by Wiley Editorial Paperback						
2	2. George Polya, Jeremy Kilpatrick, <i>The Stanford Mathematics Problem Book:</i> <i>With Hints and Solutions</i> , Dover Publications, 2009 (Kindle Edition 2013).						
3	3. Greg W. Scragg, <i>Problem Solving with Computers</i> , Jones & Bartlett 1st edition, 1996.						
	Web Resources						
	www.coursera.org/learn/computational-thinking-problem-solving						
	http://www.campusrecruitment.co.in/download.html						
	https://onlinecourses.nptel.ac.in/noc21_hs02/preview						
	https://www.itcareerlab.org/2017/04/20/10-episode-11-preparing-job-interview/						

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	М	L	М	S	М	S
CO2	S	L	М	L	S	L
CO3	L	S	L	М	S	М
CO4	М	S	S	L	S	М
CO5	S	М	М	S	L	S
	• •		3 6 34		-	

Title of t	he Course	Java Pro	grammin	Ig							
Catagor		Year	I	Credita	4	C	ourse	22	2602201		
Categor	y CC - 5	Semeste	r II	Creans	4	C	ode	234	2003201		
Instruct	ional Hours	Lecture Tutorial Lab Total CIA Externa						al	Total		
per weel	5 5 25 75								100		
	Learning Objectives										
LO1	To provide funda	umental kn	owledge o	of object-ori	iented pr	ogran	ming.				
LO2	To equip the stud	lent with p	rogrammi	ng knowled	lge in Co	ore Jav	a from th	e bas	sics up.		
LO3	To enable the students to use AWT controls, Event Handling and Swing for GUI.										
UNIT	Details								No. of riods for he Unit		
I	<b>Introduction:</b> Re Javabuzzwords - life timeofvariab conversion and c Static block - Sta	viewofOb JVMarch bles - arra asting - sin tic Data -	ject Orie itecture - ays - ope mple java StaticMetl	ntedconcep Datatypes - rators - co program - c hodStringar	ots - H Variabl ontrolstat construct od String	listory les - S tement cors - 1 Buffe	ofJava - cope and s - type nethods - rClasses.		15		
П	Inheritance: B rules - Usage of Method overrid Usage of final k Packages:Defin Interfaces:Defin Exception Hand inexceptions - Cr Exception classe	asic conce of this and ing - Abs eyword. hition-Acce nition-Imp <b>dling</b> : <i>try</i> reating ow	epts - Typ I Super k stract class essProtect plementati – catch - n	es of inheri ey word - ses - Dyna ion -Import ion–Extendi <i>throw - th</i>	itance - Method mic met ingPacka ing Inter prows –	Memb Over hod c ages. faces. finally	er access loading - lispatch -		15		
III	Multithreaded Synchronization Using <i>synchroni</i> I/O Streams: Character stream Input and Writin	Program -Usingsy zedstateme Concepts - Reading ng Console	ming: Th nchronized ent- Intertl of strea console e output -	read Class dmethods– hreadComm ms - Strea File Handli	- Runna nunicatic am clas ng.	ible in on –De ses- I	terface – adlock. 3yte and		15		
IV	AWT Controls components- Lab Box Group - Cho Bar. Working with Event Handling Delegation Mode Adapter classes -	s: The bels - Butt oice - List th Frame c g: Events el (EDM) Inner clas	AWT cla on - Text Box - Pa class - Col- - Event s - Handlir sses.	ass hierarc Component nels – Scro our - Fonts ources - E ng Mouse a	chy - ts - Chec Il Pane - and layc vent Lis and Key	user k Box Mento out ma steners board	interface - Check - Scroll nagers. - Event Events -		15		
v	Swing: Introduc Containers - To JPanel - JButto JLabel,JTextField	ction to S p level co n - JTog d - JTextA	Swing - ] ontainers - gleButton rea - JList	Hierarchy 6 - JFrame - - JCheckl - JComboł	of swin JWindo Box - J Box - JSo	g con ow - 1 Radio crollPa	nponents. Dialog - Button - ane.		15		

	Course Outcomes
Course Outcomes	On completion of this course, students will be able;
CO1	Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.
CO2	Implement inheritance, Packages, Method and classes of Core Java. Understand and implement the exception Handling in core java.
CO3	Implement multi-threading ,Synchronous, asynchronous programming and I/O Streams of Core Java
CO4	Implement interfaces using AWT and Event handling.
CO5	Understand and use the components of Swing to create GUI.

	Text Books (Latest Editions)
1	Herbert Schildt, The Complete Reference, Tata McGraw Hill, New Delhi, 7th Edition, 2010.
2	Gary Cornell, Core Java 2 Volume I – Fundamentals, Addison Wesley, 1999.
3	Head First Java, O'Rielly Publications
	References Books
	(Latest editions, and the style as given below must be strictly adhered to)
1	Java 2 Core Language Little Black Book by Alain Trottier,2002.
2	Y. Daniel Liang, <i>Introduction to Java Programming</i> , 7th Edition, Pearson Education India, 2010.
	Web Resources
	Java Basics:
1	1. <u>www.tutorialspoint.com/java/index.html</u>
1	2. <u>www.w3schools.com/java</u>
	3. <u>https://www.geeksforgeeks.org/java-tutorial/</u>
	AWT:
2	1. <u>www.javatpoint.com/java-awt</u>
2	2. <u>www.javatpoint.com/awt-program-in-java</u>
	3. <u>https://www.geeksforgeeks.org/java-tutorial/</u>
	Swing:
2	1. <u>www.javatpoint.com/java-swing</u>
5	2. <u>www.tutorialspoint.com/swing/index.htm</u>
	3. <u>https://www.geeksforgeeks.org/introduction-to-java-swing/</u>

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	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	L	Μ	S	Μ	Μ	S
CO2	S	L	S	Μ	S	L
CO3	Μ	S	L	Μ	Μ	S
CO4	L	S	S	L	S	Μ
CO5	S	М	Μ	S	L	S

 $3-Strong, 2-Medium \ , 1-Low$ 

Title of the Course		Java Pra	ctical						
Catagor	$\mathbf{C}\mathbf{C} = \mathbf{A}$	Year	Ι	Crodits	4	C	ourse	23	32603202
Categor	y CC - 4	Semester	Ι	Creans		C	ode	4.	52005202
Instruct	ional Hours	Lecture	Tutorial	Lab Practice	Total	CIA	Externa	al	Total
per wee	X	-	-	5	5	25	75		100
			Learning	g Objective	S				
LO1	To gain practical	expertise i	n coding	Core Java p	orograms	5			
LO2	To become profic	cient in the	use of A	WT, Event	Handling	g and S	wing.		
S.No	Details							P	No. of eriods for the Unit
1	Write a Java progout all the prime	gram that pr numbers up	rompts th p to that I	e user for a nteger?	n integei	r and th	nen prints		
2	Write a Java prog	gram to mu	ltiply two	o given mati	rices.				
3	Write a Java prog	gram that d	isplays th	e number o	f charact	ters, lir	les and		
	words in a text?						1 1		
4	Generate random	numbers b	etween ty	wo given lir	nits usin	ig Rano	lom class		
	Write a program	to do String	g to the r	ulation using	value ge	rter Ar	u. rav and		
	perform the follo	wing string	operatio	ns:	5 Chara		ruy und		
5	a. String len	gth	, <b>1</b>						
	b. Finding a	character a	at a partic	ular positio	n				
	<b>c.</b> Concatenating two strings								
	Write a program	to perform	the follow	wing string	operatio	ns usir	ig String		
6	a String Co	ncatenatior	ı						
Ŭ	b. Search a substring								
	<b>c.</b> To extrac	t substring	from give	en string					
	Write a program	to perform	string op	erations usi	ng String	gBuffe	rclass:		
7	a. Length of	a string							
	b. Reverse a	string	om tho gi	von string					
	Write a java pros	ram that in	nlement	s a multi-th	read ann	licatio	n that		
	has three threads.	First threa	d generat	tes random i	integer e	every 1	second		
	and if the value is even, second thread computes the square of the								
8	number and prints. If the value is odd, the third thread will print the								
	value of cube of the number.								
	Write a threading program which uses the same method asynchronously to print the numbers 1 to 10 using Thread 1 and to print 00 to 100 using								
	Thread2.	,							
	Write a program	to demonst	rate the u	se followin	g except	tions.			
	a. Arithmeti	c Exception	n						
9	b. Number F	Format Exc	eption						
	c. Array Ind	ex Out of I	sound Ex	ception					
	Write a Java pros	ram that re	eads on fi	le name fro	m the us	er. the	n		
10	displays informat	tion about v	whether the	he file exist	s, wheth	er the f	file is		
10	readable, whether	r the file is	writable,	the type of	file and	the ler	igth of		
	the file in bytes?					<u> </u>			
11	Write a program	to accept a	text and	change its s	ize and t	tont. In	clude		
	Write a Java proc	s. Use Iran	andles all	mouse eve	nts and a	shower	he		
12	event name at the	centre of t	the windo	w when a n	nouse ev	vent is	fired.		
	(Use adapter clas	ses).							

13	Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.						
<ul> <li>Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons.</li> <li>14 On selecting a button, an appropriate message with "stop" or "ready" or "go" should appear above the buttons in a selected color. Initially there is no message shown.</li> </ul>							
	Course Outcomes						
Course Outcom	se On completion of this course, students will be able;						
CO1	Code, debug and execute the Java problems						
CO2	Implement multi-threading and exception-handling.						
CO3	Implement File Handling.						
CO4	Demonstrate Event Handling and Implement Synchronous and Asynchronous programming.						
CO5	Create GUI using Swing and AWT and apply event handling.	Create GUI using Swing and AWT and apply event handling.					

References Books						
(Latest editions, and the style as given below must be strictly adhered to)						
Java 2 Core Language Little Black Book by Alain Trottier,2002.						
Y. Daniel Liang, <i>Introduction to Java Programming</i> , 7th Edition, Pearson Education India, 2010.						

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	L	М	S	М	L	S
CO2	S	S	L	М	L	М
CO3	М	L	М	L	М	L
CO4	L	L	S	М	L	S
CO5	М	М	S	S	L	М

Title of the Course		Software	e Enginee	ring						
Catagor		Year	I	Credita	2		Cou	rse	22	22602202
Category	EC - II	Semeste	r II	Creats	5		Cod	e	23	52005205
Instructi	onal Hours	Lecture	Tutorial	Lab Practice	Total	CL	A 1	Externa	al	Total
per week	<b>E</b>	4	-		4	25	5	75		100
	1	•	Learning	g Objective	s					
LO1	Knowledge of basi describes.	ic SW engin	neering met	thods and pr	actices, a	nd th	eir ap	ppropria	ate a	pplication,
LO2	A basic understanding of software engineering layered technology and process framework, including waterfall and evolutionary models.									
LO3	Understanding of models, context 1	f software nodels, an	requireme d behavior	nts and the ral models.	SRS doo	cume	ents,	data m	ode	ls, object
LO4	Understanding in static analysis, ar	nplementa nd reviews	tion diffic	ulties includ	ding mod	dular	rity, c	coding	star	ndards,
LO5	Understanding so quality.	oftware ev	olution, ve	ersion mana	gement,	qual	lity c	ontrol,	anc	l software
UNIT	T Details							Po	No. of eriods for the Unit	
I	Introduction: The software engineering discipline, programs vs. software products, why study software engineering, the emergence of software engineering, Notable changes in software development practices, computer systems engineering. Software Life Cycle Models: Why use a life cycle model, Classical waterfall model, iterative waterfall model, prototyping model, evolutionary model, spiral model, comparison of different life cycle models						12			
п	Requirements Analysis and Specification: Requirements gathering and analysis, Software requirements specification (SRS) Software Design: Good software design, cohesion, and coupling, neat arrangement, software design approaches, object-oriented vs function-12						12			
III	Function-Oriented Software Design: Overview of SA/SD methodology, structured analysis, data flow diagrams (DFD's), structured design, detailed design. User-Interface design: Characteristics of a good interface; basic concepts; types of user interfaces; component based GUI									
IV	development, a user interface methodology.Coding and Testing: Coding; code review; testing; testing in the large vs testing in the small; unit testing; black-box testing; white-box testing; debugging; program analysis tools; integration testing; system testing; some general issues associated with testing.12Software Reliability and Quality Management:Software reliability; statistical testing; software quality; software quality management12									
V	Computer Aide environment; characteristics of architecture of Characteristic engineerin of maintenance	d Softwar CASE s of CASE t f a CAS of sof ng; softwa cost;	e Enginee upport i ools; towa SE enviro tware n tre mainte	ring: CAS n softwar urds second onment. S naintenance nance proc	E and it: re life generation oftware r; soft ress mod	s sco cyc ion C Ma ware lels;	ope; ( cle; CASE ainter estir	CASE other E tool; nance: everse nation		12

Course Outcomes						
Course Outcomes	On completion of this course, students will be able;					
CO1	Gain basic knowledge of analysis and design of systems.					
CO2	Ability to apply software engineering principles and techniques.					
CO3	Model a reliable and cost-effective software system.					
CO4	Ability to design an effective model of the system.					
CO5	Perform Testing at various levels and produce an efficient system.					

	Text Books (Latest Editions)				
1	Rajib Mall, Fundamentals of Software Engineering, Fifth Edition, Prentice-Hall of India,2018.				
2	Roger S. Pressman, Software Engineering, Seventh Edition, McGraw-Hill.				
3	IanSommerville, Software Engineering, Tenth Edition, Pearson.				
	References Books				
	(Latest editions, and the style as given below must be strictly adhered to)				
1	Richard Fairley, Software Engineering Concepts, Tata McGraw-Hill publishing company Ltd, Edition 1997.				
2	James A. Senn, Analysis & Design of Information Systems, Second Edition, McGraw- Hill International Editions.				
3	R.A. Khan, A. Agrawal, Software Engineering, Narosa				
	Web Resources				
1	Software Engineering Tutorial (tutorialspoint.com)				
2	Software Engineering: What It is, Definition, Tutorial - javatpoint				
3	Software Engineering - GeeksforGeeksSoftware Engineering - GeeksforGeeks				

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	S	Μ	Μ	Μ	Μ	Μ
CO2	Μ	S	S	S	Μ	Μ
CO3	S	Μ	S	S	Μ	Μ
CO4	S	Μ	S	Μ	Μ	Μ
CO5	Μ	Μ	Μ	S	S	Μ
CO5	M	М	M	S	S	Μ

			<b>7</b> 1/1 11									
Title of t	he Course	NME - N	/lultimedi	a								
Catal	SEC II	Year	Ι	C 124	2	C	ourse	224(0222)				
Category	NME	Semester	r II	Creatts	2	C	ode	234003220				
Instructi per week	onal Hours	Lecture	Tutorial	Lab Practice	Total	CIA	Extern	al Total				
per week		2	-		2	25	75	100				
Learning Objectives												
	The key to lea	rning mu	ltimedia	is to be e.	xposed	to the	e princip	oles, examples				
	and latest infor	rmation. S	So that ye	ou can app	oly your	knou	ledge.					
								No. of				
UNIT		Details						<b>Periods for</b>				
		the Unit										
т	Introduction-Hist	(										
1	Copyright-Resou	rces for M	es for Multimedia Developers.					0				
п	Hardware Architecture-Operating System and Software-Multimedia							(				
11	Architecture.	0										
	The Elements of	of text-Te	xt Data I	Files-Using	Text i	n Mu	ultimedia					
TTT	Applications-Hyp											
111	Graphics File	iges for	0									
	Multimedia Use											
117	Digital Audio: C	haracterist	ics of Sou	nd and Digi	ital Audi	o-Dig	ital	(				
11	Audio Systems-	MIDI –Au	idio File F	Formats.		-		0				
<b>X</b> 7	Characteristics of	of Sound	and Digit	al Video-	Digital	Video	o sizing-	(				
v	Video capture a	and play 1	Back syst	ems-Compu	uter Ani	matio	n.	6				

#### **Course Outcomes**

Course Outcomes	On completion of this course, students will be able;					
CO1	Define multimedia and its resources to develop multimedia					
CO2	Identify and describe the architecture of multimedia both hardware and software					
CO3	Identify the basic components of a multimedia					
CO4	Understand the standards available for different audio formats					
CO5	Understand the standard available for different audio formats					

# Text Books (Latest Editions)David Hillman, Multimedia Technologyand Applications, Golgotha Publications PvtC LTD,1998.

UNIT	CHAPTERS
Ι	1
II	3
III	4,5
IV	6
V	7

#### **References Books**

# (Latest editions, and the style as given below must be strictly adhered to)

- 01. Tay Vaughan Multimedia Making it work 7<sup>th</sup> edition, Tata McGraw-Hill Publishing company limited, New Delhi, Re-Print 2014.
- 02. Ralf steinmetz, Klara Nahrsted "Multimedia computing, Communications & Application", 1<sup>st</sup> Edition, Pearson Education India, 2002.
- 03. Ashish chopra, Preeti srivastav "Multimedia Applications", 1<sup>st</sup> Edition, Ishan Publications, 2020.

Web Resources						
https://www.tutorialpoint.com/multimedia/index.htm						
Https://www.academic.edu/28499586/CHAPTER_3_MULTIMEDIA_TECHNOLOGY_AN						
_INTRODUCTION						

<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	
3	3	3	2	2	
3	3	3	3	1	
3	3	3	2	1	
3	3	2	3	1	
3 3		3	2	3	
	PO 1       3       3       3       3       3       3       3	PO 1     PO 2       3     3       3     3       3     3       3     3       3     3       3     3       3     3	PO 1         PO 2         PO 3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3           3         3         3	PO1         PO2         PO3         PO4           3         3         3         2           3         3         3         3           3         3         3         2           3         3         3         2           3         3         2         3           3         3         2         3           3         3         2         3           3         3         2         3           3         3         3         2	

Title of t	he Course	Quantit	ative Apti	tude	1				
Category	se - III	Year	I	Credits	2		Course	23440322	26
Instructi	onal Hours	Semeste	r   11	Lab	Total				
per week		Lecture	Tutorial	Practice	10141	CIA	Extern	al Tota	<u>ની</u>
•		2	-		2	25	75	100	)
Learning Objectives						s students i	is to		
LOI	develop skills to meet the competitive examinations for better job opportur						tunities	15 10	
LO2	Effort has been made to accommodate fundamental, mathematical aspects to insti-						nstill		
	confidence among students.								
LO3	Help them learn	more and	improve tl	neir ability	to think	logica	lly. To th	ink analytic	cally
	about a wide rang	ge of solut	ions to pu	zzles.					
LO4	To categorize, ap	ply and us	se thought	processes to	o disting	uish ł	between c	oncepts of	
	Quantitative met	nods.							
LO5	To prepare and	l explain	the fund	damentals	related	to v	arious p	ossibilities	and
	probabilities relat	ted to qua	ntitative ap	otitude.					
			Deta	ile				NO. 01 Periods f	for
UNIT				1115				the Uni	it
Ι	I Numbers-HCFandLCMofnumbers-Decimalfractions-								
	Simplification-	Squarero	ootsander	iberoots-A	Average	<b>)</b> -		6	
II Problems on Ages - Surds and Indices - percentage - profits									
	and loss - ratio and proportion-partnership-Chainrule.						6		
III	Time and wor	k - pipe	s and cis	terns - Ti	ime and	d Dis	stance -		
	problems on t	rains -B	oats and	streams	- simp	le in	terest -	6	
	Volumeandsur	facearea-	- L coding a	nd decodi	ng	AI	- ea		
IV	Permutationand	dcombin	ation-pro	bability-A	nalytic	al 1	easoning	3 6	
	– verbal reason	ing- puz	zles-Odd	manout ar	nd Serie	es.		U	
V	Calendar - Clo	cks - sto arGraph	cks and s	hares - Da	ata repr	esent	ation -	6	
		arorapin	s-i icenai	ts-Linegit	ipns.			U	
L			Course	Outcomes					I
Course		On cor	nnletion o	f this course	e studen	ts wil	be able.		
Outcom	es				, studen				
C01	Understand and solve basic problems with numbers.								
CO2	Solve proble	Solve problems on ages, profit and loss, and ratio and proportions							
CO3	Acquire reasoning and problem-solving skills								
CO4	Analyze and solve problems on time, work and distance.								
CO5	Apply reason	ing skills	to interpre	t data, draw	conclus	sions,	and solve	problems.	
		U	T	,		,		•	

Text Books (Latest Editions)							
1	"QuantitativeAptitude",R.S.AGGARWAL.,S.Chand&CompanyLtd.,						
2	2 R.V.Praveen, Quantitative Aptitude, and Reasoning, 2nd Revised Edition 2013, Prentice- Hall of India Pvt.Ltd.						
3	Quantitative Aptitude by Pearson publications.						
References Books							
(Latest editions, and the style as given below must be strictly adhered to)							
1	Quantitative Aptitude by Arun Sharma McGrawhill publications						
2	Quantitative Aptitude by Ananta AsishaArihant publications.						
	Web Resources						

1	Learn Time and Work Aptitude The Right Way (in Record Time) (placementpreparation.io)
2	Aptitude Questions and Answers - IndiaBIX
3	Learn Aptitude Formulas, Tips and Tricks PrepInsta

	<b>PO</b> 1	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>
CO1	S	S	S	S	S	S
CO2	S	S	Μ	Μ	Μ	S
CO3	S	S	S	Μ	Μ	Μ
CO4	S	Μ	Μ	Μ	S	Μ
CO5	S	S	S	S	Μ	S