MCA I Sem/I Year Syllabus



Name of the	Master of Comp	uter Applic	ation (MCA	A)	Year/ Semester:	-	1 st / 1 st
Program Course Name	Fundamente	als of	Course	MCA0101T	Type	7	boory
Course Mame	Computers	and	Code.	WICAUIUII	Type.	1	l lieol y
	Programming	using C	couc.				
	Languag	e					
Credits		04	4	·	Total Sessions	6) Hours
		ſ			Hours:		
Evaluation	Internal		30 Marl	kS	End Term	70	Marks
Spread	Continuous				Exam:		
	Assessment:	-			-	_	
Core	C Major	C Minor	C Electiv	e	Co-curricular	01	/ocational
Comment	1 5 1	1			1 1 .		
Course Objectives	1. To learn	basics of Co	omputer fund	damentals, memo	ry and number system	1S. 	1. 1
Objectives	2. 10 intro	duce the bas	and with arr	like variable, dat	atypes, operators, dec	21S10n n	naking and
	3 To learn	functions s	tructure and	union			
	4 To learn	advanced n	rooramming	concepts of C la	nguage		
Course Outcome	s (CO): After the s	uccessful co	urse complet	tion. learners will	develop following att	ributes	
Course Outcome		uccessjui eo			acretop jonowing an	romes	•
(CO)				Attributes			
CO1	Understand bas	ics of Comp	uter fundam	entals, Memory,	I/O Devices and softw	vare.	
CO2	Understand the	basic conce	pts of C prog	gramming langua	ge and able to identify	y the ne	eed and use
	of programming	g in real wor	ld.				
CO3	Use functions,	pointers, arra	ay and string	g using C languag	e.		
CO4	Design and dev	elop progra	ms utilizing	advance C progr	camming concepts like	e struct	ture, union,
D 1	pre-processor a	nd enumerat	ion etc.	. 1	•		
Pedagogy	Interactive, disc	cussion-base	s, student-ce	entered, presentat	ion.		
Internal	Mid-term Exan	nination: 12	Marks				
Evaluation Mode	Attendance:	()4 Marks)4 Marks				
	Assignment [.]	()5 Marks				
	Presentation:	(05 Marks				
Session Details			Тор	ic		Ho	Mapped
						urs	CO
	Introduction	to Comput	er: Definiti	ion, Block Diag	gram of Computer,		
	Characteristics	of Compu	ter, Classif	ication of Com	puters, History of		
	Computers, Ger	neration of (Computers, A	Applications of co	omputer.		
	devices Keyb	nory Unit, oard Mous	Primary M	emory, Seconda	ry Memory. Input		
Unit 1	Resolution Ret	fresh Rate	Video standa	ord Types of Pri	ters Plotter Sound	14	CO1
	Card and Spe	akers. Soft	ware Conc	epts: Definition.	System Software.		
	Application So	ftware, Utili	ty Package.	Programming L	anguages: Concept,		
	Classification of	of languages	, and introd	luction to Compi	ler, Interpreter, and		
	Assembler.						
	Overview of C	Language:	Introduction	n. Salient features	of C. Structure of C		
	programs. C L	anguage Fu	indamentals	: Character set,	Data type and sizes,		
	Execution and	Compilation	of C progra	ms.	,		
	Operators and	Expression	ns: Various	type of operators	used in C language.		
Unit 2	Types of expres	ssion, Preced	lence and as	sociativity of exp	ression.	16	CO2
	Structure of C	program: -	Compilation	n and execution.	arious type of Input		
	and Output fund	ction. Forma	itted input an	tod if also also	on.		
	statement Brog	ments: 11, ak Continue	n-eise, Nes	ment Loops. Int	roduction for loop		
	statement, DICa	in, continue	, goto state	ment. Loops. III	10000, 101 100p,		

		while loo Types of String: C	while loop, do-while loop, Nesting of loops. Arrays: Defining of Array, Types of Array, initialization and declarations. String: Character Arrays, Arrays and strings, String Manipulation. Functions: Built-in and user-defined function. Types of user defined										
υ	Jnit 3	Function function, definition automatic Pointers: value, Ca calloc () a	s: Built- Functio , Recursi , register Introduc Il by refe and mallo	in and n protot ve function, extern). tion, Point erence, Point or () funct	and user-defined function, Types of user defined prototype declaration, Function call, and function functions, Array and functions. Storage Classes (static, ktern). n, Pointer operators (&, *), Parameter passing : Call by nce, Pointer to Pointer, Dynamic Memory Allocation :) functions.								
τ	Jnit 4	Structure initializati and union File Hand mode file writing of	e and U ion of stru- a, enumer dling: Sea e, writing f direct fi	nion: Defining structure and union, Declaration and icture and union variables, Differences between structure ation. juential file, Direct File, open (), fprintf (), fscanf (), reading and append mode file, opening Direct file, reading and e, seekg (), seekp () functions.									
CO-PC) and PSO M	Mapping											
СО	PO1	PÔ2	PO3	PO4	PO5	PO6	PO 7	PO8	PSO 1	PSO2	PSO	3	PSO4
CO1	2	2	3	2					1	1			
CO2	2	3	3	1	1	3	2	2	2	1	1		1
CO3	3	2	2	3	1	2		1	1	3	1		1
CO4 Strong	2 contribution	3 1-3 Ave	3 rage con	2 tribution	2 3 1 2 3 1								
contrib	ution-1,		i ugo com		-, 10%								
Sugges	ted Reading	gs:		"T				DIII					
Text- I	BOOKS		V. Kajara Peter Nor	man, "Fu ton's "In	troduction	s of Com	puters"	, PHI TMH					
		3.	Yashwan	t Kanitka	r, "Let us (C", BPB.	uters,	1 10111					
		4. (Gottfried,	, "Program	mming in (C", Schau	m's Ser	ies, Tata	a McGra	aw Hill.			
Refere	ence Books	1. I	D.S. Yada	av, "Four	idation of l	Informatio	on Tech	nology'	', New <i>I</i>	Age Inter	nation	al.	0
		2. 1	rogramn Kernigha	ning in A m Ritchi	e "The C	Programm	amy, 1a ning La	ata MCC mguage'	' PHI	11, 4th Eu 1977 Ind	inon, . ia Ne	200 w D	ð. Jelhi
		4. I	Pointers i	n C, Yasl	hwant Kan	etkar, BP	B Publi	ication,	3rd Edit	100, 2003	3.		•
e-Le	earning	• 1	nttps://ww	ww.tutori	alspoint.co	m/compu	iter_fun	dament	als/inde	<u>x.htm</u>			
		• 1	nttps://ww	ww.geeks	forgeeks.o	rg/c-prog	<u>rammir</u>	<u>ng-langu</u>	lage/				
		• 1	<u>nttps://on</u>	linecours	es.nptel.ac	<u>.in/noc22</u>	<u>cs40/</u>	<u>preview</u>	• .				
		• •	ntps://on	mecours	es.swayam	12.ac.1n/ce	2019 08	soo/prev	<u>lew</u>				
Recapi	tulation & I	Examinatio	on Patter	'n									
Interna	al Continuo	us Assessm	ent:										
Compo	onent		Mark	s Pat	tern		_						
Mid Se	mester		12	Sec	tion A: C	ontains 0	5 MCC	Qs/Fill i	n the b	lanks/On	e Woi Morke	d A	Answer/
				Sec	tion B: Co	ontains 02	descrit	otive que	estions a	and each	questio	on c	arries 2
				mar	·ks.		1	. 1			1		
				Sec	tion C: Co	ontains 04	descri	ptive qu	estions	out of wl	hich 0.	3 qu	lestions
				are	to be atten	npted. Eac	ch ques	tion cari	nes 05 N	larks.			
				50%	% of the m	arks obt	ained i	n the m	id sem	ester exa	minat	ion	will be
0.5			0.4	add	ed to the in	nternal as	ssessme	ent.	.1.		04	N /	1
Quiz To	est ment		04	Cor	ignment to	escriptive	e quest	ions. Ea	nstructi	tion carri	es 01	viec	'К. t
Assigili	ment		05	teac	cher	, oc maue	on top		iisuucu	on given	by sut	,,	L
Present	ation		05	Pres teac	sentation to ther	be made	e on top	oics and	instructi	on given	by sul	bjec	t

Attendance	04	As per policy
Total Marks	30	

Course created by:	Approved by:
Signature:	Signature:



Name of the Program	Master of Comp	outer App	lication (N	ICA)	Year/ Semester:	15	st / 1 st
Course Name	Fundamenta	ls of	Course	MCA0101P	Туре:	Pra	actical
	Computers :	and wing C	Code:				
	Language I	lsing C Lab					
Credits		0	2	1	Total Sessions Hours:	60	Hours
Evaluation	Internal		30 Ma	rks	End Term Exam:	70	Marks
Spread	Continuous						
Corp.	Assessment:			activa.		0 V/c	
Core			U EIE	ective	Co-cumcular	0 10	cational
Course	1. To iden	tify basic	component	s of the compute	r system.		
Objectives	2. To intro	duce the b	basic conce	pts like variable,	datatypes, operators of	f C langua	ge.
	3. To learn	n decision	making and	d looping stateme	ent along with arrays.		
	4. To learn	n functions	s, structure	and union.	~ .		
Common Oration	5. To learn	advanced	l programn	ning concepts of	C language.		
Course Outcome	es (CO): After the s	successful	course con	npletion, learner.	s will develop following	g attributes	•
Outcome (CO)				Attributes	5		
CO1	Explain basics of	f Compute	r fundamer	ntals, Memory, I/	O Devices and softwar	e.	
CO2	Create programs	to exhibit	basic data t	types, variables, o	operations, conditional	and loopir	ng statement
	using the C langu	lage.					
<u>CO3</u>	Demonstrate the	concept o	f functions,	, pointers, array a	and string using C prog	rams.	
CO4 Podogogy	Implement advar	iced C pro	gramming	concepts like str	ucture, union, and file	handling e	tc.
Internel	Mid tarma Drag	4: a a 1 E- a a		Newles			
Evaluation	• Mid-term Prac	tical Exan	nination: 12	2 Marks			
Mode	 Experiment = v Execution of P 	rooram -		05			
	Practical File F	Record -		04			
	Viva-Voce	-		04			
Session Details			10	թւշ		Hours	Mapped CO
	1. Write C prog	gram to fir	d largest of	f three integers.			
	2. Write C prog	gram to fir	d factorial	of an integer.	· · · · · · · · · · · · · · · · · · ·		
Unit 1	3. Write C prog	gram to ch	eck whethe	r the given string	s is palindrome or not.	13	CO1
Cint I	of an integer			rights of all lifeg	er ær roduet or digits	15	001
	5. Write C prog	gram to fir	d whether	the given integer	is: A prime number.		
	6. Write C prog	gram for P	ascal triang	,le.			
	1. Write C prog	ram to fin	d sum and a	average of n integ	ers using linear array.		
	2. Write C pro	ogram to	perform a	ddition, multipli	cation, transpose on		
	matrices.	more to fi	nd factoria	l of a by accurate	an using usar defined		
	functions			I OI II Dy lecuisio	on using user defined		
Unit 2	4. Write a C pro	ogram to s	ort a Linea	r Array of numbe	er by Bubble Sort and	15	CO2
	Selection So	rt.					
	5. Write C prog	gram to pe	rform follo	wing operations	by using user defined		
	functions: Co	oncatenati	on.	· • • • • • • • • • • • • • • • • • • •	n n*2/21 +*4/41		
	0. write C prog	gram to fi	nd sum of 1	in terms of series	$n n^{2}/2! + n^{4}/4! +$		
TT 44.2	1. Write C	program	to interchai	nge two values u	sing: Call by value.	1.	coc
Unit 3	2. Write C	program t	o interchan	ge two values usi	ing: Call by reference.	17	CO3

		3. Wr Lir 4. Wr Bin 5. Wr allo 6. Wr strr 1. Wr 2. Re	tite a C p near Sean tite a C p nary Sean tite C pro- pocation. tite C pro- nacture. tite C pro- ad from	program f rch. program f rch. ogram to s rogram to pgram to j data file (ram for searching an integer in a linear array using m to sort the list of integers using dynamic memory am to display the mark sheet of a student using m to perform following operations on data files: file (Sequential & Direct File). le (Sequential & Direct File).								
Uı	nit 4	3. Wi 4. Wi con 5. Wi 6. Wi 7. Wi and	ite to da ite C pro- mmand 1 ite the P ite the P ite the F 1 Star.	a file (Sequential & Direct File). gram to copy the content of one file to another file using ne argument.15rograms to print some pattern using star (*). rograms to print some pattern using Digits (1,2,3). Programs to print some pattern using Alphabets, Digits15									
CO-PO) and PSC) Mapping	DOA	D O (r	1				
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO	2	PSO:	3 PSO4
CO1	2	2	1	2	2 2 1 1 1 1								
CO2	2	2	1	1	1	3	4	1	2	2		1	2
<u>CO3</u>	3	3	2	3	1	2	1	1	1	2		1	1
CO4 Strong	5 contributi	$\frac{3}{10n-3}$ Ave	<u> </u>	2 3 1 2 3 2 2 tribution-2 Low contribution-1									
Sirong	comnoun	<i>on-5, Ave</i>	luge con		-2, L0	wconni	ounon	ι,					
Sugges	sted Readi	ngs:				~							
Text-1	Books	$\begin{array}{ccc} 1. & V. \\ 2 & V. \end{array}$	Rajaram	an, "Fund	lamental	ls of Coi	nputers	", PHI					
		2. Ya	snwant I	Canitkar,	Let us of the le	C", BPB	um's So	rios Tat	McGro				
Dofe	ranca	1 Pro	umeu,	$r \log t a N$	$\frac{1110}{\text{SLC}}$ Ba		vamy 7	Tata McC	raw_Hill	$\frac{\sqrt{1111}}{\sqrt{1111}}$	ditio	n 200	8
Bo	ooks	2. Ke	rnioham	Ritchie	"The C	Program	ming L	anguage'	' PHI 10)77 In	dia 1	n, 200 New Γ	o. Delhi
		3. Co	mputer [Fodav. Su	resh Bas	sandra. (Galgotia	Publicat	ion. 1stee	lition.	2010).	
e-Lea	arning	• htt	ps://ww	w.geeksfo	orgeeks.	org/c-pro	ogramm	ing-lang	uage/	,			
	8	• htt	ps://onli	necourses	.nptel.ac	.in/noc2	2 cs40/	preview					
		• htt	ps://www	w.tutorials	spoint.co	m/com	outer fu	ndament	als/index.	htm			
		• <u>htt</u>	os://onli	necourses	.swayan	12.ac.in/	cec19 c	cs06/prev	riew				
Recapi	itulation &	& Examination	on Patte	rn									
Interna	al Continu	ious Assessm	ent:										
Compo	onent		Mark	s Pat	tern								
Mid Se	emester		12	Sec	tion A:	Contains	5 04 pra	ctical que	estions ou	t of w	hich	03 qu	estions are
				to b	e attemp	ted. Eac	h questi	on carrie	es 08 Ma i	rks.			
				50%	6 of the	marks	obtaine	d in the	mid sen	ester	exan	ninatio	on will be
E ····		41	05		ed to the	e interna	assess	ment.					
Experii	ment – Wri	ting	05	Will be decided by subject teacher									
Execut	ION OF Prog	gram	05	Wil	will be decided by subject teacher					an only is at			
Practic	аі гне кес	cora	04	Prac	ucal Ille	e to be n	iade on	experime	ents and 1	nstruct	lion §	given t	by subject
Viva	oce		04		her polie	V							
Total N	Marke		30	AS	per pone	y							
IUTAL	viai KS		50										

Signature:

Approved by:



Name of the Program	Master of Con	puter Appli	:	1	1 st / 1 st				
Course Name	Operating System	Course Coo	de:	MCA01	102T	Туре:		ſ	Theory
Credits		04				Total Sessions Hours:		60) Hours
Evaluation	Internal		30 Ma	rks		End Term Exar	n:	70	Marks
Spread	Continuous Assessment:								
Core	🔿 Major	O Minor	C Ele	ective		Co-curricular		0	/ocational
Course	1. To intr	roduce the get	neric str	ructure of	an Oper	rating System			
Objectives	2. To det	ail the concer	ots of Pr	ocesses, 7	Threads	and Synchronizat	ion prii	nciples	
	3. To exp	vide an idea	ents abo	out the Me	mory M	lanagement, Prote	ction		
Course Outcomes	(CO): After the st	uccessful cour	rse com	pletion. le	arners v	will develop follow	ving att	ributes	•
Course Outcome		ieeessjui eeu	se com	<i>pienen, ie</i>		, in develop jonon	ing an	1011105	
(CO)				Au	ributes				
C01	Know different	OS types and	l basic c	componen	t of OS	Architecture.			
CO2	Analyze issues	in process ma	anageme	ent and ev	aluatior	is of various schee	luling a	algorith	ims.
C03	Understand me	mory manage	ement, p	aging and	i trasnin	g.			
Pedagogy	Interactive, disc	ussion-bases	. studen	t-centered	1. preser	ntation.			
Internal	Mid-term Exam	ination: 12) Marks		, F				
Evaluation Mode	Attendance:	04	4 Marks						
	Quiz Test:	04	4 Marks						
	Assignment:	05	5 Marks						
Searcher Details	Presentation:	05	5 Marks	D . .				TT.	Manad
Session Details				opic				H0 urs	CO Kapped
	Introduction:	Operating sy	stem st	ructure, (OS serv	vices and Component	nents,		
	Types of opera	ting system,	Functio	ns of OS.	. Operat	tions of US, US d	lesign		
Unit 1	System Boot:	Introduction	. Syster	m Boot.	Dual b	oot operation. Sy	vstem	15	CO1
	components, O	perating-Sys	stem Se	rvices, S	ystem (Calls: Types of Sy	ystem		
	Calls, System P	rograms, Sys	tem stru	ucture, Vi	rtual Ma	achines.			
	Processes and	Threads: Pr	ocess C	Concept, P	rocess	Scheduling, Opera	ations		
	on Processes, C	Looperating F	rocesse	es, CPU s	cheduli	ng criteria, Sched	luling		
Unit 2	Interprocess C	ommunication	n, Com	municatio	on in C	Client Server Sys	tems,	10	CO2
	Multithreading	Models, Thre	ead Libi	raries, Th	reading	Issues, P-threads	Basic		
	Concepts.								
	Memory Man	agement: N	lemory	Manager	ment B	ackground, Swap	oping,		
	Contiguous Me	mory Alloca	tion, Pa	iging, Seg	gmentati	on, Segmentation	with		
Unit 3	Paging, Virtua	al Memory,	Dema	ind Pagn	ng, Pro	cess Creation,	Page	15	CO3
	Replacement, A	llocation of F	rames,	Thrashing	g, Opera	ting- System Exan	nples,		
	Ciner Consider	ations.		Tetheda D		Structure Eile St			
	Mounting, File	e Sharing. F	Protectic	on File-S	vstem	Structure, File-S	vstem		
Unit 4	Implementation	, Directory I	mpleme	ntation, A	llocatio	n Methods, Free-S	Space	20	CO4
	Management, I	Efficiency an	d Perfo	rmance, l	Recover	y, Log-Structured	l File		
	System, NFS.								
CO-PO and PSO M	Apping								

СО	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	1	1	3	2		2		2	1	2		
CO2	3	2	2	1	1	3	1	1	2	1	1	1
CO3	1	2	3	3		2	2	3	2	2	2	1
CO4	2	3	3	PO4PO5PO6PO7PO8PS01PS02PS03PS042221211111311211132232221213223221213223322213223322213233222132332221323322213233222132332221323322213233222132332221323322211111121111111211111113223322111111111111111111								
Strong contribu	contribution ution-1,	1-3, Aver	rage contri	bution-2	2, Low	,						
Suggest	ted Reading	s:										
Text- B	sooks	1. S V 2. S E	Silberschatz Viley & So Sibsankar H Education.	, Galvir ns Inc. aldar, A	n and Ga Alex A.A	igne, "Op travind, "	erating Operati	System ng syste	Concepts	s", 10th E d Edition	dition, Jo , Pearson	ohn
Refere	nce Books	1. H 2. T 3. U	Harvey M E Fannenbaur Jnleashed I	Deital, "O n, "Ope Linux by	Operatin rating S / Tech N	ıg System ystem", Т ledia Puł	n", Addi MH olishers,	son We New D	sley. elhi.			
e-Le	arning	• h	ttps://www	.tutoria	lspoint.c	com/opera	ating sy	vstem/os	overvie	w.htm		
		h	ttps://onlin	ecourse	s.swaya	m2.ac.in/	'cec20_c	cs06/pre	view			
Recapi	tulation & I	Examinatio	n Pattern									
Interna	l Continuo	us Assessm	ent:									
Compo	nent		Marks	Patt	ern							
Mid Ser	mester		12	Secti True Secti mark Secti are to 50% adde	ion A: -False ty ion B: C is. ion C: C o be atte of the d to the	Contains /pe of que contains (Contains (mpted. E marks of internal	05 MC estions. 02 descr 04 descr ach que btained assessm	CQs/Fill Each qu iptive qu stion cas in the p cent.	in the b nestion can nestions a uestions rries 05 M <i>mid seme</i>	lanks/On arries 01 I and each a out of wl Marks . ester exa.	e Word A Marks. question of nich 03 q mination	Answer/ carries 2 uestions <i>will be</i>
Quiz Te	est		04	Cont	ains 04	descripti	ve ques	tions. E	ach ques	tion carri	es 01 Ma	rk.
Assignr	ment		05	Assi teach	gnment her	to be mad	le on toj	pics and	instructi	on given	by subjec	rt
Presenta	ation		05	Prese teach	entation her	to be ma	de on to	pics and	l instructi	on given	by subje	ct
Attenda	ince		04	As p	er policy	/						
TatalN	Iarks		30									

Signature:

Approved by:



Name of the Program	Master of Con	nputer Appli	cation (MCA)		Year/ Semester:	-	1 st / 1 st
Course Name	Software Engineering	Course Coo	de:	MCA0103	BT	Туре:	ſ	Theory
Credits		04				Total Sessions Hours:	60) Hours
Evaluation	Internal		30 Ma	rks		End Term Exam:	70	Marks
Spread	Continuous							
-	Assessment:		_			-	-	
Core	C Major	C Minor	C Ele	ctive		C Co-curricular	OV	ocational
Course	1. To und	derstand the e	ssential	s of software	e engi	ineering.		
Objectives	2. To und	lerstand the v	arious s	oftware deve	elopr	nent models.		
	3. To ide	ntify the key	element	s of software	e des	ign process.		
	4. To exp	plain the funct	tion of e	each element	of a	memory hierarchy.		
Course Outcomes	(CO): After the st	uccessful cour	rse com	pletion, learn	ners 1	will develop following att	ributes	·
Course Outcome				Attril	outes	1		
(CO)								
C01	Apply theoretic	al foundation	of soft	ware enginee	ering	in practical software dev	elopme	ent
CO2	Discuss the soft	tware life cyc	le mode	els				
CO3	Identify the imp	portance of the	e softwa	are developn	nent j	process		
CO4	Apply software	engineering	practice	s to create co	omple	ex software designs		
Pedagogy	Interactive, disc	cussion-bases	, studen	t-centered, p	reser	ntation.		
Internal	Mid-term Exam	nination: 12	2 Marks					
Evaluation Mode	Attendance:	04	4 Marks					
	Quiz Test:	04	4 Marks					
	Assignment: Presentation:	03	5 Marks 5 Marks					
Session Details	Tresentation.	0.		Conic			Ho	Manned
Session Details			-	opie			urs	CO
Unit 1	Introduction software proces Software proces software devel	to software ss, software en ess models: so lopment life odel introduct	e engin ngineeri oftware cycle r tion to a	eering: def ng practices developmen nodel, proto gile method	fine t life otypi	software engineering, cycle (SDLC), classical ng model, V model, oftware development	14	CO1
	Requirement	engineerin	g: rec	luirement	engi	neering, requirement		
Unit 2	requirement and characteristics of	alysis, stakend specification: of a good SRS	older an softwa 5, functi	alysis re requirem onal and nor	va ent s 1-fun	pecification document, ctional requirement	16	CO2
	Design: design	n process, de	esign co	oncepts, cou	pling	g, cohesion, data flow		
	diagram (DFD)), flow chart,	archite	ctural design	n, co	mponent-based design,		
Unit 3	object-oriented	design, clas	s-based	component	s, us	se case diagram, class	15	CO3
Oline 5	diagram, activit	y diagram					15	005
	User interface	design : golde	en rules,	interface des	sign 1	nodels, interface design		
	process, interfa	ce design acti	vities					
	Software testir	ng: test design	n, test pl	anning,		1. 1. 1		
Unit 4	test case definit	non, Testing	strateg	ies: black bo	ox tes	sting, white box testing,	15	CO4
Unit 4	Testing levels :	unit testing.	integra	tion testing.	syst	em testing, acceptance	15	04
	testing, regressi	on testing	8	8,		<i>U</i> , I		

		Software	maintena	nce: so	oftware	maintena	ance, s	oftware	support	ability,		
		reenginee	ring, busir	ness pr	ocess r	eenginee	ring, so	oftware	reengin	eering,		
		restructur	ng, econon	nics of r	reengine	ering						
СО-РО	and PSO N	Japping										
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4
CO1	1	1	1	1	2		1	2	1			
CO2	3	3	3		1	3		1	2	1	1	1
CO3	2	3	2	2	2	2	2	2	2	2	1	1
CO4	2	2	2		2	3		2		3		
Strong o contribu	contribution ution-1,	1-3, Ave	rage contril	bution-2	2, Low	,						
Suggest	ted Reading	ζs:										
Text- B	ooks	1. F	R. Pressman	, "Softv	ware Eng	gineering	", TMH					
		2. I	ankaj Jalot	e, "An l	Integrate	ed Approa	ach to S	oftware	Engineer	ring", Na	rosa	
Referen	nce Books	1. F	Pankaj Jalot	e, "Soft	ware Pr	oject Mar	nagemer	nt in Pra	ctice", Pe	earson Ec	lucation.	
e-Le	arning	• 1	ttps://www	.tutoria	lspoint.c	om/softw	vare_eng	gineerin	g/index.h	<u>itm</u>		
		• <u>h</u>	ttps://nptel	.ac.in/co	ourses/1	06105182	<u>2</u>					
												
Recapit	ulation & I		n Pattern									
Interna	l Continuou	us Assessm	ent:									
Compo	nent		Marks	Patte	ern							
Mid Ser	nester		12	Secti	ion A:	Contains	05 MC	Qs/Fill	in the b	lanks/On	e Word	Answer/
				True	-False ty	pe of que	estions.	Each qu	estion ca	rries 01 I	Marks.	
				Secti	ion B: C	contains 0	2 descri	ptive qu	lestions a	and each o	question	carries 2
				South	is.	Containa	M docor	intivo a	nactions	out of wi	hich 02	mastions
				are to	o he atte	moted F	ach que	ipuve q	ries 05 N	Jarks	11011 05 0	questions
				are u		inpica. L	ach que	stion ca	11103 05 1	1ai Ko.		
				50%	of the	marks of	btained	in the r	nid seme	ester exa	mination	ı will be
				adde	d to the	internal	assessm	ent.				
Quiz Te	est		04	Cont	ains 04	question	s. Each	question	carries (01 Mark.		
Assignn	nent		05	Assi	gnment	to be mad	le on top	pics and	instructi	on given	by subje	ct
Dessert			05	teach	her	4 a h a m a			1 in a t mar 1 i		h	
Presenta	ation		05	teach	entation her	to be mad	ue on to	pics and	instructi	on given	by subje	ect
Attenda	nce		04	As p	er policy	/						
Total M	larks		30									

Signature:

Approved by:



Name of the	Master of Comp	uter Applie	cation (MCA)	Year/ Semester:	-	1 st / 1 st			
Course Name	Computer	Course	Code:	MCA01047	Т Туре:]	Theory			
	organization and architecture									
Credits		04			Total Sessions	60) Hours			
Evoluction	Internal		20 Ma	mlza	Hours:	70	Monka			
Spread	Continuous		JU 191 a	11 K5	Enu rerm Exam.	70) IVIAI KS			
-	Assessment:		_							
Core	C Major	C Minor	O Ele	ctive	Co-cumcular	01	/ocational			
Course	1. To have	a thorough	h under	standing of t	he basic structure and ope	ration of	of a digital			
Objectives	compute	er.								
	2. Remem	per and unde	erstand t	the basics of c	omputer architecture, organi	zation a	and Design.			
	3. An abil	ity to unde	rstand	the functions	of various hardware com	ponents	s and their			
	building	blocks	ing = 6.0	Santucl Days	aina Unit @ 1/O and a'					
Course Outcomes	(CO): After the suc	understand	ing of C	pletion learn	sing Unit & 1/U organization	1. trihutes	•			
Course Outcome		eessjut eeur	<u>be com</u>	A ttrib	ntos					
(CO)				Attribu						
C01	Understand the fu	indaments o	daments of a digital computer system. ter organization and design.							
	Learn basic comp	outer organiz	ter organization and design.							
C03	Learn organizatio	on of compu	ter men	nory and acce	ss methods.	ha intar	eation flow			
04	among them		n a Uasi	c computer, n	s registers, ous system and t		action now			
Pedagogy	Interactive, discu	ssion-bases.	studen	t-centered. pro	esentation.					
Internal	Mid-term Examin	nation: 12	2 Marks	1						
Evaluation Mode	Attendance:	04	4 Marks							
	Quiz Test:	04	Marks							
	Assignment: Presentation:	05	5 Marks							
Session Details]	Горіс		Но	Mapped			
						urs	CO			
	Basic of Digital	Electronic	s: Intro	duction to lo	gic gates. Primary Gates,					
	Derived gate, U	niversal G	ate, Bo	bolean Algeb	ra, Logical expression:					
	Algebraic & K	andard 1011	ns, kec	four variables	don't care conditions					
Unit 1	Combinational	Logic: Con	nbinatio	onal circuits.	binary adder- subtractor.	18	CO1			
	introduction to de	ecoders, enc	oders, r	nultiplexers, c	le-multiplexers.					
	Sequential logic	: Sequential	l circuit	s, synchronou	is and asynchronous, flip					
	flops, RS, D, JK,	T, Master s	lave flip	p flop.						
	Basic Compute	r Organiza	ation a	nd Design:	Computer registers, bus					
	system, instructi	on set, tim	ing an	d control, in	struction cycle, memory					
	reference instruct	ions, input-	output a	and interrupt.			CCCCCCCCCCCCC			
Unit 2	Memory Unit: In	ntroduction	of comp	outer memory	classification, Concepts of	15	CO2			
	Direct Memory	Access (D	MA):	Introduction,	DMA Transfer modes .					
	sequential access	, direct acce	ess stora	ge devices.	,					

U	Jnit 3	Control I arithmetic word in m Hardwired Microprog Prefetchir	Control Design: Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Hardwired Control, Micro programmed control (Microinstruction, Microprogram sequencing, Microinstruction with Next-address field, Prefetching Microinstruction).15CO3Processor Design: Processor Organization: General register organization.161717									
U	J nit 4	Processon Stack org manipulat Input-Ou Interrupt Communi	rocessor Design: Processor Organization: General register organization, tack organization, Addressing mode, Instruction format, Data transfer & hanipulations, Program Control, RISC & CICS Architecture.12nput-Output Organization: I/O Interface, Modes of transfer, Interrupts handling, Programmed I/O, Input-Output processor, Serial communication.12									
CO-PC) and PSO M	Aapping										
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	3 PSO4
CO1	2	2		3	2	3		2	1	1		1
CO2	1	2	2	2	1	2	1	1	2	2	1	
CO3	3	3	2	2	3	2		3	2	2		1
CO4	2	2		3	2	3	1	2	2	1	1	
Strong	contribution	1-3, Ave	rage contri	bution-2	2, Low	[,] ontribut	tion-1,					
Sugges	ted Reading	s:										
Text- E	Books	1. N	M. Mano, "	Comput	er Syste	m Archit	ecture",	Pearson	n Educati	on, New	Jersey,	2017, 3rd
		2. V	Ed. W. Stallings Prentice Ha	gs, "Computer Organization and Architecture Designing for Performance", fall of India, 2015, Tenth Edition.								
Refere	ence Books	1. N	M. Mano, "	Digital l	Design"	, Pearson	Educati	on, Nev	v Jersey,	2018, Siz	th Edit	ion.
e-Lo	earning	M. Mano, "Digital Design", Pearson Education, New Jersey, 2018, Sixth Edition. <u>https://www.javatpoint.com/digital-electronics</u> <u>https://onlinecourses.swayam2.ac.in/cec21_cs16/preview</u>										
		<u> </u>	- ì			<u>m2.ac.m/</u>	<u>cec21 c</u>					
Recapi	tulation & I	Examinatio	on Pattern			<u>m2.ac.1n/</u>	<u>cec21 c</u>	-				
Recapi Interna	itulation & I al Continuo	Examinatio	n Pattern ent:			m2.ac.1n/						
Recapi Interna Compo	itulation & I al Continuo onent	Examinatio us Assessm	on Pattern ent: Marks	Patto	ern	m2.ac.m/						
Recapi Interna Compo Mid Se	itulation & I al Continuo onent mester	Examinatio us Assessm	on Pattern ent: Marks 12	Patto Secti True Secti mark Secti are to 50% adde	ern ion A: -False ty ion B: C is. ion C: o be atte of the d to the	Contains ype of qu Contains (Contains (mpted. E marks of internal	05 MC estions. 02 descri 04 descri cach ques btained assessm	Qs/Fill Each qu ptive qu iptive q stion can in the n ent.	in the bluestion ca lestions a uestions of N mid seme	anks/On rries 01 I nd each o out of wl 1arks .	e Word Marks. question nich 03 minatio	1 Answer/ n carries 2 questions on will be
Recapi Interna Compo Mid Se	itulation & I al Continuo onent mester est	Examinatio us Assessm	m Pattern ent: 12 04	Patta Secti True Secti mark Secti are to 50% adde Cont	ern ion A: -False ty ion B: C is. ion C: C b be atte of the d to the ains 04	Contains ype of qu Contains (Contains (mpted. E marks of internal descripti	05 MC estions. 02 descri ach ques btained assessm ive ques	Qs/Fill Each qu ptive qu iptive q stion can in the r in the r tent. tions. E	in the bluestion ca lestions a uestions of tries 05 M <i>nid seme</i> fach quest	anks/On rries 01 I nd each o out of wl Jarks . ester exa	e Word Marks. question nich 03 mination es 01 N	1 Answer/ n carries 2 questions on will be fark.
Recapi Interna Compo Mid Se Quiz To Assignu	est ment	Examinatio us Assessm	m Pattern ent: 12 04 05	Patta Secti True Secti mark Secti are to 50% adde Cont Assig teach	ern False ty on B: C is. ton C: C b be atte of the d to the ains 04 gnment ter	Contains ype of qu Contains (Contains (mpted. E marks of internal descripti to be made	05 MC estions. 02 descri 04 descri ach ques btained assessm ive ques de on top	Qs/Fill Each qu iptive qu iptive q stion can in the r tent. tions. E bics and	in the bl testion ca testions a uestions of tries 05 N <i>nid seme</i> tach quest instructio	anks/On rries 01 I nd each o out of wl Aarks . ester exa tion carri on given	e Word Marks. question nich 03 mination es 01 M by subj	1 Answer/ n carries 2 questions on will be Mark.
Recapi Interna Compo Mid Se Quiz To Assigni Present	est ment ation	Examinatio	Marks 12 04 05 05	PattaSectiTrueSectimarkSectiare to50%addeContAssigteachPreseteach	ern False ty on B: C s. o be atte of the d to the ains 04 gnment er entation her	Contains ype of qu Contains (Contains (mpted. E marks of internal descripti to be mad to be mad	05 MC estions. 02 descri 04 descr dach ques btained assessm ive ques de on top de on top	Qs/Fill Each qu iptive qu iptive q stion car <i>in the r</i> <i>tions</i> . E pics and	in the bl lestion ca lestions a uestions of rries 05 N mid seme lach quest instruction	lanks/On rries 01 I nd each o out of wl 1arks . ester exa tion carri on given on given	e Word Marks. question nich 03 mination es 01 M by subj	1 Answer/ n carries 2 questions on will be Mark. ject
Recapi Interna Compo Mid Se Quiz To Assignt Present Attenda	est ment al Continuou onent mester	Examinatio	Marks 12 04 05 04 05 04	Patto Secti True Secti mark Secti are to 50% adde Cont Assig teach Prese teach As p	ern ion A: -False ty ion B: C is. ion C: C is be atte of the d to the ains 04 gnment ter entation ter er policy	Contains ype of qu Contains (Contains (Contains (mpted. E marks of internal descripti to be mad	05 MC estions. 02 descri 04 descr cach ques btained assessm ive ques de on top de on top	Qs/Fill Each qu ptive qu iptive q stion can in the r tent. tions. E bics and pics and	in the bl lestion ca lestions a uestions of rries 05 M <i>nid seme</i> lach quest instruction	anks/On rries 01 I nd each o out of wl farks . <i>In given</i> on given	e Word Marks. question nich 03 mination es 01 M by subj	1 Answer/ n carries 2 questions on will be Mark. ject

Approved by:

Signature:



Department of Computer Science Era University, Lucknow Course Outline Effective from: 2024-25

Name of the Program	Master of Computer Application (MCA)				Year/ Semester:	1 st / 1 st				
Course Name	Computer Networks	Course Code: MCA0105T		Туре:	Theory					
Credits	THE WOLKS	04		I	Total Sessions Hours:	al Sessions 60 urs:				
Evaluation Spread	Internal Continuous Assessment:		70	Marks						
C Core	O Major	O Minor	0	/ocational						
Course Objectives	 To build an understanding of the fundamental concepts of computer networking. To familiarize the student with the basic taxonomy and terminology of the computer networking. To get familiar with transmission media and network topologies. To understand the OSI model and its layers. 									
Course Outcome	(CO): After the suc	cessjui cours	se comp	Attributes	witt develop jottowing dit	nouies.	•			
(CO)	Understand basic	computer pe	twork	technology						
CO1	Understand and e	xplain Data (Comm	unications System	m and its components.					
CO3	Identify the differ	Identify the different types of network topologies and protocols.								
CO4	Enumerate the layers of the OSI model and TCP/IP and explain the function(s) of each layer.									
Pedagogy	Interactive, discussion-bases, student-centered, presentation.									
Internal Evaluation Mode	Mid-term Examination:12 MarksAttendance:04 MarksQuiz Test:04 MarksAssignment:05 MarksPresentation:05 Marks									
Session Details		Ho urs	Mapped CO							
Unit 1	Introduction to Network protocol Computer Addr IPv4 Addressing netting Network requin devices – Hub, S	18	C01							
Unit 2	Network Topologies and Network Architectures: Network Topologies: Bus, Star, Ring, Mesh, Network Architectures: Client/Server Architecture, Peer-To-Peer Architecture.15Open System Interconnect (OSI) Reference Model - TCP/IP Model - TCP Operation - UDP Operation - Flow Control - Congestion Control.15									
Unit 3	Local Area Networks: Switching, Packet Switching and Forwarding, LAN Technologies, Ethernet, Token Bus, Token Ring, Wireless LAN, Multiple Access Protocols, Error-Detection and Correction Techniques: Parity bit and Hamming code.15CO3Wide Area Networks: WAN Components – WAN Technologies - WAN Encapsulation - Routing: Static Routing and Dynamic Routing - Routed Protocols (IP and IPX) - Routing Protocols.1617									

U	nit 4	Protocols : Address Resolution Protocol (ARP) Protocol - Dynamic Host Configuration Protocol (DHCP)- Domain Name System (DNS) – Internet Protocol (IP) – Internet Control Message Protocol (ICMP) - Hypertext Transfer Protocol (HTTP) - File Transfer Protocol (FTP) - Simple Mail Transfer Protocol (SMTP), Remote Administration Protocols: Telnet and Secure Shell (SSH).									12	CO4		
CO-PO	and PSO N	/Iapping	DO1	DO 4	DOF		DOF	1	1	1	r			
CO	POI	PU2 PU3 PU4 PU5 PU6 PU7 P08 PS01 PS02										3 PSO4		
CO1	2	2 3 2 3 2 1 1										1		
CO2	1	2	2	2	1	2	1	1	2	2	1			
CO3	3	3	2	2	3	2		3	2	2		1		
CO4	2	2		3	2	3	1	2	2	1	1			
Strong	contribution ution_1	-3, Ave	rage contri	button-	2, Low	,								
Suggest	ted Reading	· C •												
Text- B	looks		A Forou	zan "D	ata Corr	municati	on and I	Network	ring" Ta	ta McGra	w Hill			
ICAU D	OOK 5	2. 5	5. Tanenbau	1000 m	3). Com	puter Ne	tworks.	4th edit	ion. Pear	son Educ	ation/1	PHI. New		
		I	Delhi, India		- ,,	r	·····,		,			, - · - · ·		
Refere	nce Books	2. W. Stallings, "Data and Communication" Prentice Hall of India												
e-Le	earning	https://www.javatpoint.com/computer_network_tutorial												
		 https://onlinecourses.swayam2.ac.in/cec19_cs07/preview 												
					<u>sisting</u>				110 11					
Recapi	tulation & H	Examinatio	n Pattern											
Interna	al Continuou	ıs Assessm	ent:											
Compo	nent		Marks	Patt	ern									
Mid Semester 12 Section A: Contains 05 MCQs/Fill in the blanks/One Word And True-False type of questions. Each question carries 01 Marks.								d Answer/						
				Secti	ion B: C	Contains (2 descri	iptive qu	lestions a	and each	questic	on carries 2		
				mark	is.	~ •								
				Section C: Contains 04 descriptive questions out of which 03 que							questions			
				are to be attempted. Each question carries 05 Marks .										
				500/	6.4			• 1	• •		• •			
				50%	of the	marks ol intonnal	nainea	in ine i	mia seme	ester exa	minaii	on will be		
Ouiz Test 04 Contains 04 descriptive questions Feeb question corries 01 Mark									Mark					
Assignment 05					annent	to be made	le on to	nice and	instructi	on given	by sub	iect		
					teacher									
Presentation 05					Presentation to be made on topics and instruction given by subject									
			teacher											
Attendance 04					As per policy									
Total N	Iarks													

Course created by:

Signature:

Approved by:



Department of Computer Science Era University, Lucknow Course Outline Effective from: 2024-25

Name of the Program	Master of Comp	1 st / 1 st								
Course Name	Mathematical N	Туре:	Theory							
Credits		45	5 Hours							
Evaluation Spread	Internal Continuous Assessment:		70) Marks						
Core	🔿 Major	O Minor	0	/ocational						
Course Objectives	 To learn To intro To learn To learn To learn 	 To learn basics of mathematics. To introduce the basic concepts of set theory. To learn Cartesian co ordinate system. To learn central tendency and fundaments of probability. 								
Course Outcome	s (CO): After the st	uccessful co	ourse complet	tion, learners will	l develop following att	ributes	:			
Course Outcome				Attributes						
(CO)	Able to calcula	te rank of	matrix inver	se of the matrix	& use the concept of	matrix	to find the			
001	solution of syst	em of linea	r equations.		a use the concept of	matrix	to find the			
CO2	Understand the	basics of s	et theory.							
CO3	Understand the	Cartesian	co ordinate s	system, basic for	mulae of plane geom	etry ar	nd different			
<u>CO4</u>	forms of equation	on of straig	int line.	and basis sonesn	ta of probability					
Pedagogy	Interactive disc	ules of cell	es student-ce	and basic concep	ion					
Internal	Mid torm Evo	mination.	12 Morka	intered, presentat	1011.					
Evaluation Mode	Attendance:									
	Quiz Test:	Quiz Test: 04 Marks								
	Assignment:	Assignment: 05 Marks								
Constan Data In	Presentation:		05 Marks	• -		TT.	Manad			
Session Details			Toh	ic		по urs	CO			
Unit 1	Definition of d skew symmetri matrix, Determ of Linear Equa square matrix.	Definition of different types of matrix , Algebraic operations, Symmetric & skew symmetric matrix, Transpose of matrix, Orthogonal matrices, Rank of matrix, Determinant of a square matrix, Inverse of a square matrix, Solution of Linear Equations by Cramer's Rule, Eigen values & Eigen vectors of a square matrix.								
Unit 2	Set Theory: In Proofs of some relations, Prope Recursive defin Functions: Def Recursively def	Set Theory: Introduction, Combination of sets, Multisets, Ordered pairs. Proofs of some general identities on sets. Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Recursive definition of relation, Order of relations.16CO2Functions: Definition, Classification of functions, Recursively defined functions.16CO2								
Unit 3	Coordinates, Se line, Conditions line joining two a straight line.	Coordinates, Section formula, Distance formula, Slope or gradient of straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slopeintercept form of a straight line, normal form of a straight line.								
Unit 4	Measures of central Tendency – Mean, Median, Mode, Measures of Dispersion-Standard deviation and Coefficient of variance. Probability- Sample space and events, Definition of probability, Elementary properties of probability.									

CO-PO and PSO Mapping														
СО	POI	PO2	PO3	PO4	P05	PO6	PO 7	PO8	PSO 1	PSO2	PSO3	PSO4		
CO1	2	2	3	2					1	1				
CO2	2	3	3	1	1	3	2	2	2	1	1	1		
CO3	3	2	2	3	1	2		1	1	3	1	1		
CO4	2	3 3 2 3 1 2 3 1												
Strong contribution-3, Average contribution-2, Low contribution-1,														
Suggested Readings:														
Text- B	Text- Books 1. 12 th N.C.E.R.T. Book. 2. Probability theory and random process by S.P. Eugene Xavier, S. Chand & company Pvt. Ltd 3. Mathematics and statistics by Aiay Goval. Taxman Allied Service Pvt. Ltd.										oany			
Refere	nce Books	ks 1. Differential calculus by Shanti Narayan, S. Chand.												
e-Le	e-Learning <u>https://nptel.ac.in/courses/122104018/</u> <u>https://nptel.ac.in/courses/111104085</u> 													
Recapi	tulation & I	Examinatio	on Patter	'n										
Interna	l Continuo	us Assessm	ent:											
Compo	nent		Mark	s Patt	ern									
Mid Semester 12 Section A: Contains 05 MCQs/Fill in the blanks/One Word Answ True-False type of questions. Each question carries 01 Marks. Section B: Contains 02 descriptive questions and each question carries marks. Section C: Contains 04 descriptive questions out of which 03 questi are to be attempted. Each question carries 05 Marks. 50% of the marks obtained in the mid semester examination will added to the internal assessment.								Answer/ carries 2 uestions <i>will be</i>						
Quiz Test 04					Contains 04 descriptive questions. Each question carries 01 Mark.									
Assignment 05 Assignment to be made on topics and instruction given by subject teacher							t							
Presenta	ation		05	Prese teach	entation to her	be made	on top	ics and	instructi	uction given by subject				
Attenda	nce		04	As p	er policy									
Total Marks 30														