RGPV (I	DIPLO	MA WING	6) BHOPAL	OBE CUP	RRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1
Branch			Cor	nputer Science and	d Engineering	Semester	5 th
Course Co	de		C04	Course Name	Algorithm Design and	Analysis	
						Teach Hrs	Marks
Course Outco	ome 1		• Describe	the analysis of algorit	hm efficiency using different notations.	30	30
Learning Out	tcome 1	1	• Demonst	rate the basic data stru	icture and algorithm.	8	PT 1(10)
Contents			 Introduct B Measurin Orders of A 	ion to Algorithm: asic Algorithmic prob og Running time comp f Growth Worst-case, symptotic Notations a	lem solving, Types of problem. lexity on the basis of the input size Best-case and Average-case efficiencies, and O-notation, Ω -notation, θ -notation		
Method of As	sessme	ent		Inter	nal Theory Examination		
Learning Ou	tcome	2	Calculate	e the sum of first n th te	rms of a series.	12	ET(10)
Contents			 Introduct E Arithmet A.P./ G.F natural m 	ion to Functions and S xponential and Logari ic Progression (A.P.), P./ Combination of A.I umbers, Sum of squar	Series: thmic Functions Geometric Progression (G. P.), Sum of n terms P. and G.P., Solving summation, Sum of first n es of the first n natural numbers.	of	
Method of As	ssessme	ent		End	Term Theory Examination		

Learning Outcome 3	• Describe various recursive and non-recursive algorithms.	10	ET(10)
Contents	 Mathematical analysis of non-recursive algorithms and recursive algorithms. Solving Recurrence relation using Master Theorem 		
Method of Assessment	End Term Theory Examination		
Course Outcome 2	• Express the various searching and sorting problem.	25	30
Learning Outcome 1	• Explain various Searching algorithms and also its performance characteristics.	7	ET(10)
Contents	 Analysis of Sorting and Searching Introduction to Brute Force approach, Divide-and-Conquer approach Binary Search tree, Balance binary Search tree, related properties. Hashing techniques and collision resolving using linear probing, quadratic probing and Separate chaining 		
Method of Assessment	End Term Theory Examination		
Learning Outcome 2	• Discuss the problems of Brute Force approach and decrease-and-Conquer.	8	ET(10)
Contents	 Brute Force approach: Linear Search Selection sort, Bubble sort Decrease-and-Conquer: Insertion Sort 		
Method of Assessment	End Term Theory Examination		

Learning Outcome 3	• Discuss the problems of Divide-and-Conquer approach.	10	ET(10)
Contents	 Divide-and-Conquer approach Binary Search, Merge Sort, Quick Sort, related properties. 		
Method of Assessment	End Term Theory Examination		
Course Outcome 3	• Describe the graph structure and its operations.	20	20
Learning Outcome 1	• Explain the various major components of graph and topological sorting technique.	10	TW(10)
Contents	 Introduction of Graph: Definition of a directed and undirected graph. Paths, Cycles, Spanning trees. Directed Acyclic Graphs. Topological Sorting. 		
Method of Assessment	Internal Quiz/Assignments		
Learning Outcome 2	• Write an algorithm to calculate minimum weight spanning tree in a connected graph.	10	ET(10)
Contents	 Introduction to Greedy approach Minimum Spanning Tree algorithms. Prim's Algorithm, Kruskal's Algorithm Shortest Path algorithms: Dijkstra's Algorithm. 		
Method of Assessment	End Term Theory Examination		

Course Outcome 4	• Discuss the basic String related operations.	15	20
Learning Outcome 1	• Explain string sorting and substring searching.	8	ET(10)
Contents	 String Problem Sorting, Tries, Substring Search 		
Method of Assessment	End Term Theory Examination		
Learning Outcome 2	• Illustrate basic pattern matching and data compression.	7	PT II(10)
Contents	Regular Expressions, Elementary Data compression.		
Method of Assessment	Internal Theory Examination		

Abbreviation:

PT: Progressive Test

TW: Term Work

ET: External Theory

			SCHEME FOR LE	ARNING	Bran	ch Code		Course C	ode	CO Code	LO Code	Л
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COU	RSE NAME	Algorithm Design and	Analysis		'						· ·	
CO D	escription	Describe the analysis of alg	orithm efficiency using differ	ent notations.								
LO De	escription	Demonstrate the basic data	structure and algorithm.									
		-	SCHEM	E OF STUDY								
S. No.	L	earning Content	Teaching –Learning Method	Description Proces	of T-L s		Гeach Hrs.	Pra /T Hr	ict. ut s.	LRs R	equired	d Remarks
1	 Introdu Measur comple size Orders Best-ca efficient and C notation 	action to Algorithm: Basic Algorithmic problem solving, Types of problem. Fing Running time exity on the basis of the input of Growth Worst-case, ase and Average-case ncies, Asymptotic Notations D-notation, Ω -notation, θ -n	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	Interactive classi teaching, demor quiz, assignment tutorial Teacher explain the conte provide handout students. Teacher conduct assignm quiz/tutorial to r students practice knowledge.	room astration astration will ents and as to er will hents/ make e their		05	0	3	Handc Books Conte	uts / / E- nts	NIL
	1		SCHEME O	F ASSESSMENT						1		I
S. No.	Met	hod of Assessment	Description of Assessment	Maxin	num M	arks		Res	ource	es Requ	iired	External / Internal
1	Intern	al Theory Examination	Progressive Test		10				Test	t Paper		Internal
		A	DDITIONAL INSTRUCTIONS	FOR THE HOD/	FACUL	TY (II	F ANY)					

RGPV	/ (Diplo	oma Wing) Bhopal	SCHEME FOR LEA	RNING	Branch Code	e C 4	Course Code	CO Code	LO Code	Format No. 4
COURS	E NAME	Web Technology	001001	OUTCOME C 0 4 0 1 ency using different notations. C 0 4 1 ency using different notations. C 0 4 1 ency using different notations. Figure 1 Teach Process Pract. Pr	2					
CO Des	cription	Describe the analysis of alg	orithm efficiency using differe	nt notations.						
LO Des	cription	Calculate the sum of first n ^t	^h terms of a series.							
		1	SCHEME	OF STUDY						
S. No.		Learning Content	Teaching –Learning Method	Descriptic Proc	on of T-L ess	Teach Hrs.	Pract. /Tut Hrs.	R	LRs equire	d
1	 Introc Series Expo Funct Arith Geon Sum Comb Solvi n natu squar numb 	duction to Functions and s: nential and Logarithmic tions metic Progression (A.P.), netric Progression (G. P.), of n terms of A.P./ G.P./ bination of A.P. and G.P., ng summation, Sum of first ural numbers, Sum of res of the first n natural pers.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	Interactive class teaching, demo quiz, assignme Teacher will ex contents and p handouts to stu Teacher will co assignments/ o to make studen their knowledg	sroom onstration, nts, tutorial plain the rovide udents. nduct guiz/tutorial nts practice ge.	08	04	Hai Boo Cor	ndouts oks / E- ntents	/ NIL
			SCHEME OF	ASSESSMENT	r					
S. No.	Me	thod of Assessment	Description of Assessment	Max	imum Marks	S	Resource	s Req	uired	External / Internal
1	End T	erm Theory Examination	End Term		10		Test	pape	r	External
		A	DDITIONAL INSTRUCTIONS F	OR THE HOD	FACULTY (I	F ANY)			I	

	(Dinla	ma Wing) Ph	onal	SCHEM	E FOR LEAR	NINC	6	Branch (Code	c	ourse Co	ode	CO Code	LO Code	/
KGPV		oma wing j br	юраі	(OUTCOME		C	0	4				1	3	Format No. 4
COURS	E NAME	Web Technology	У												
CO Des	cription	Describe the analys	sis of algo	orithm efficienc	y using different	notation	ıs.								
LO Des	cription	Describe various re	cursive a	nd non-recursiv	ve algorithms.										
		1			SCHEME O	F STUC	ργ								
S. No.	Lear	ning Content	Teachi N	ng –Learning 1ethod	Description o Process	f T-L	Teach Hrs.	Pra /Tut	act. Hrs.		.Rs Ro	equir	ed		Remarks
1	 No. Learning Content Mathematical analysis of non-recursive algorithms and recursive algorithms. Solving Recurrence relation using Master Theorem 		Interactive teaching, demonst assignme Teacher ve contents handouts Teacher ve assignme quiz/tuto students knowledg	ve classroom ration, quiz, ents, tutorial will explain the and provide s to students. will conduct ents/ prial to make practice their ge.	Interactive classed teaching, demonstration, q assignments, tuto Teacher will expla contents and pro- handouts to stude Teacher will cond assignments/ quiz/tutorial to m students practice knowledge.	oom uiz, orial ain the vide ents. luct uct their	06	C	4	Hand Cont	louts ,	/ Bool	ks / E-	NIL	
					SCHEME OF AS	SSESSI	/IENT								
S. No.	Me	thod of Assessmer	nt	Description of	of Assessment	Max M	imum arks		R	esour	ces R	equir	ed		External / Internal
1	End T	erm Theory Examina	ation	End	Term	:	10			Te	st pa	per			External
	I		AD	DITIONAL INS	TRUCTIONS FOR	R THE I	HOD/ FA	CULTY	(IF A	NY)					

		ama Mina \ Dhanal	SCHEME FOR LEA	ARNING	В	ranch (Code	Cou	ırse Code	CO Code	LO Code	Format No.
KGP		oma wing j bhopai	OUTCOM	E	С	0	4	r i		2	LRs Required Handouts / Books / E- Contents Required External Internal	4
COURS	E NAME	Web Technology							· · ·			
CO Des	cription	Express the various searching	and sorting problem.									
LO Des	cription	Explain various Searching alg	orithms and also its perform	ance characteris	stics.							
		,	SCHEME	OF STUDY								
S. No.		Learning Content	Teaching –Learning Method	Descripti Proc	on of cess	T-L		Teach Hrs.	Pract. /Tut Hrs.	Re	LRs equired	Remarks
1	 Anal Intro- appro- appro- Binar Searce Hash resol quad chain 	ysis of Sorting and Searching duction to Brute Force bach, Divide-and-Conquer bach ry Search tree, Balance binary ch tree, related properties. ing techniques and collision ving using linear probing, ratic probing and Separate hing	Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	Interactive class teaching, demo quiz, assignmen Teacher will ex contents and p handouts to stu Teacher will co assignments/ q make students knowledge.	sroom onstrat nts, tu plain t rovide udents nduct juiz/tu practi	tion, torial he s. toria ce th	l l to eir	05	02	Har Boc Cor	ndouts / oks / E- ntents	NIL
			SCHEME OF	ASSESSMENT	•							
S. No.	M	ethod of Assessment	Description of Assessment	Ma	ximu	m N	larks		Resou	rces Re	equired	External / Internal
1	End	Ferm Theory Examination	End Term		1	.0			т	est pap	per	External
		ADD	ITIONAL INSTRUCTIONS F	OR THE HOD/	FAC	ULT\	((IF /	ANY)	,			

	/ (Diplo	iploma Wing) Bhopal		SCHEME F	OR LEAF	NING	Branch	Code	Course C	ode	CO Code	LO Code	/
KGPV		illa vvilig j D	пораг	OU.	TCOME		C 0	4			2	2	Format No. 🕂
COURS	E NAME	Web Technolog	SY										
CO Des	cription	Express the variou	s searchi	ng and sorting proble	em.								
LO Des	cription	Discuss the proble	ms of Br	ute Force approach a	nd decrease-	and-Conquer							
		·			SCHEME C	F STUDY							
S. No.	Lear	ning Content	Теас	hing –Learning Method	Descript Pro	ion of T-L cess	Teach Hrs.	Pract. /Tut Hrs	LR	ls Req	uired		Remarks
1	Brute O O	Force approach: Linear Search Selection sort, Bubble sort ease-and-Conquer: Insertion Sort.	Interacti teaching quiz, ass Teacher contents handout Teacher assignme make stu knowled	ve classroom s, demonstration, ignments, tutorial will explain the s and provide s to students. will conduct ents/ quiz/tutorial to udents practice their ge.	Interactive of teaching, demonstrat assignments Teacher will contents an handouts to Teacher will assignments quiz/tutoria students pra- knowledge.	classroom ion, quiz, s, tutorial explain the d provide students. conduct s/ l to make actice their	06	02	Ha Boo Co	ndouts oks / E ntents	; / -	NIL	
	1			SC	HEME OF A	SSESSMENT	•	1					1
S. No.	Met	thod of Assessme	nt	Description of As	sessment	Maximum	n Marks	Re	ource	s Req	uired		External / Internal
1	End Te	erm Theory Examin	ation	End Tern	n	10)		Test	paper	•		External
			A	DDITIONAL INSTRU	ICTIONS FO	R THE HOD/	FACULT	((IF ANY)					

)h e e e l	SCHEME	FOR LEAR	NING	Branch Code	C	ourse Code	CO Code	LO Code	Л
KGPV		oma wing) E	snopai	0	UTCOME		C 0	4		2	3	Format No. 4
COURS	E NAME	Web Technolo	gy			'	I I					
CO Des	cription	Express the vario	ous searchir	ng and sorting pro	blem.							
LO Des	cription	Discuss the probl	ems of Div	vide-and-Conquer	approach.							
		1			SCHEME O	F STUDY						
S. No.	Learı	ning Content	Teachi	ing –Learning Method	Descripti Pro	ion of T-L cess	Teach Hrs.	Pract /Tut H	t. Irs.	LRs Requ	uired	Remarks
1	• Divic appro o	le-and-Conquer bach Binary Search, Merge Sort, Quick Sort, related properties.	Interactive teaching, o quiz, assig Teacher w contents a handouts Teacher w assignmen to make st their know	e classroom demonstration, nments, tutorial ill explain the and provide to students. ill conduct ats/ quiz/tutorial cudents practice vledge.	Interactive class teaching, demo quiz, assignme Teacher will ex contents and p handouts to st Teacher will co assignments/ o make students knowledge.	ssroom onstration, nts, tutorial plain the provide udents. onduct quiz/tutorial to practice their	06	04	Ha E-	andouts / Contents	Books /	NIL
					SCHEME OF AS	SSESSMENT						
S. No.	Me	ethod of Assessm	nent	Description of	Assessment	Maximur	n Marks	Re	source	s Require	d	External / Internal
1	End 7	Ferm Theory Exam	ination	End t	erm	10)		Test	Paper		External
	1		AD	DITIONAL INST	RUCTIONS FOR	R THE HOD/	FACULTY (II	ANY)				

	/ (Dinla	ma Wing \ P	honal	SCHEME F	OR LEAR	NING	Branch Code	c	ourse Cod	e	CO Code	LO Code	/
KGPV		Describe the graph Image: Describe the graph	nopai	OU	TCOME		C 0 4				3	1	Format No. 4
COURS	E NAME	Web Technolog	5Y										
CO Des	cription	Describe the graph	n structure	e and its operations.									
LO Des	cription	Explain the variou	s major c	omponents of graph	and topologi	cal sorting te	chnique.						
					SCHEME O	F STUDY							
S. No.	Lea	arning Content	Теа	aching –Learning Method	Descrip Pr	otion of T-L ocess	Teach Hrs.	Pr /Tu	ract. t Hrs.	LRs	s Req	uired	Remarks
1	 Introd Defin undire Paths, trees. Direct Topol 	luction of Graph: ition of a directed a ected graph. , Cycles, Spanni ted Acyclic Graphs logical Sorting.	nd Inter quiz, quiz, tutor expla provi stude assig quiz/ stude know	active classroom ning, demonstration, assignments, rial Teacher will ain the contents and ide handouts to ents. her will conduct nments/ (tutorial to make ents practice their vledge.	Interactive c teaching, de quiz, assignn Teacher will contents and handouts to Teacher will assignments make studer knowledge.	lassroom monstration, nents, tutorial explain the d provide students. conduct / quiz/tutoria nts practice th	06 I to eir		04	Hand Bool Cont	douts <s e<br="">ents</s>	5 / -	NIL
	1		I	SC	HEME OF A	SSESSMENT	•						
S. No.	Method	of Assessment	Des	scription of Assess	ment	Maxim	um Marks	R	esourc	es Re	quir	ed	External / Internal
1	ا /Quiz	Internal Assignments		Term Work			10		Assign qu	ment estior	/qui ns	Z	Internal
			A	DDITIONAL INSTRU	JCTIONS FO	R THE HOD/	FACULTY (IF AI	NY)					

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	V I				OUTCOME		(0	4				3	2	
COURS	E NAME	Web Technolo	gy												
CO Des	cription	Describe the grap	h structure	and its opera	tions.										
LO Dese	cription	Write an algorithm	m to calcula	ate minimum	weight spanning the	ree in a o	connecte	d graph.							
					SCHEME C	OF STUE	γ								
S. No.	Learn	ing Content	Teaching Me	–Learning thod	Description o Process	f T-L	Teach Hrs.	Prac /Tut	ct. Hrs.	L	.Rs Re	equire	d		Remarks
1	 Introduction to Greedy approach Minimum Spanning Tree algorithms. Prim's Algorithm, Kruskal's Algorithm Shortest Path algorithms: Dijkstra's Algorithm. 		Interactive teaching, demonstra assignmen Teacher wi contents a handouts t Teacher wi assignmen quiz/tutori students p knowledge	classroom tion, quiz, ts, tutorial Il explain the nd provide o students. Il conduct ts/ al to make ractice their	Interactive classroo teaching, demonst quiz, assignments, tutorial Teacher w explain the conten provide handouts students. Teacher conduct assignmen quiz/tutorial to ma students practice t knowledge.	om ration, ill ts and to will nts/ nke heir	06	02		Hanc	louts , ents	/ Book	s / E-	NIL	
					SCHEME OF A	SSESSI	/IENT								
S. No.	Method	of Assessment	Des	cription of A	ssessment	Max Ma	imum arks		R	esour	ces Re	equire	ed		External / Internal
1	End T Ex	Ferm Theory amination		End ter	m	:	10			Te	st pap	ber			external
			4.0						/15 .						

DCDV/(Diplome Wing) Bhonel				SCHEME FOR LEARNING		Brar	Branch Code		Course Code			LO Code	Л
RGPV (Diploma wing) Bhop			пораг	OUTCOME		С	0 4				4 1		Format No. 4
COURS	E NAME	Web Technolog	у										
CO Description Discuss the basic String rela				ted operations.									
LO Des	cription	Explain string sorti	ing and su	bstring searching.									
SCHEME OF STUDY													
S. No.	Learning Content		Teaching –Learning Method		Description of T-L Process		Teach Hrs.	Р /Т	Pract. ut Hrs.	R	LRs Required		Remarks
1	 String Problem Sorting, Tries, Substring Search 		nteractive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.		Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.		06		02	Har Boo Cor	Handouts / Books / E- Contents		NIL
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment		De	scription of Asses	sment Ma	Maximum Ma		1arks Resou		ces Required		red	External / Internal
1	End Term Theory Examination			End term		10			Test paper				external
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

DCDV/Diplome Wing) Dhenel				SCHEME FOR LEARNING		Branch Co	de (Course Code		LO Code	Л	
RGPV (Diploma wing) Bhopai			nopai	OUTCOME		C 0	4		4	2	Format No. 4	
COURSE NAME Web Technology												
CO Description Discuss the basic String related operations.												
LO Description Illustrate basic pattern matching and data c					ion.							
		1		S	CHEME OF STUDY							
S. No.	Learning Content		Teaching –Learning Method		Description of T-	Teach Hrs.	Pract. /Tut Hrs	Pract. /Tut Hrs.		Remarks		
1	• Regular Expressions, Elementary Data compression.		Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.		Interactive classroom teaching, demonstration, quiz, assignments, tutorial Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.		05	02	H B C	landouts , ooks / E- ontents	/ NIL	
				SCHE	ME OF ASSESSMEN	т						
S. No.	Method of Assessment		De	escription of Assessm	ent Maximum Ma		arks	Res Rec	ource Juired	es d	External / Internal	
1	Internal Theory Examination			Progressive Test-II		10			Test Paper		Internal	
	1		AD	DITIONAL INSTRUCT	IONS FOR THE HOD	/ FACULTY	(IF ANY)	1				