RGPV	RGPV (DIPLOMA WING) BHOPAL				OBE CURRICULUM FOR THE COURSE		FORMAT-3		Sheet No. 1/3	
Branch			Engin	-	uter Science and nformation Technology	Serr	Semester		Third	
Course Code C			C04	Course Name	COMPUTER ARCHITECT	URE				
	·						Teacl	n Hrs	Marks	
Course	e Outco	ome 1	Interpret	various t	ype of micro-operations and instructions.		3	0	38 (10+28)	
Learni	ing Out	tcome 1	Understand Register transfer language and micro-operations.					10		
C	ontents	5	 Micro-e Types e Arithme Logical implem 	operation of micro- etical (Bin l (AND, C entation.	operations: ary Adder, Binary adder-subtractor, Binary Incrementor OR, X-OR, Complement) and its Hardware					
Learnin	Example 2 Identify the importance of various registers.							06	05 (PT)	
C	 Contents Computer registers: accumulator registers, data registers, address registers program counter, stack pointer, Instruction register, memory data register, memory buffer register, input register, output register, temporary register. Common Bus System using different registers. 									

Learning Outcome 3	Explain Instruction cycle and types of instructions	09	14
Contents	 Instruction codes, Stored Program Organization, Timing and control (Hardwired control and micro programmed control), Basic computer Instruction format, Instruction cycle Types of instructions: memory- reference, register-reference and input-output registers, Instruction set completeness 		
Learning Outcome 4	Discuss Interrupt and its types.	05	05 (PT)
Contents	Input-Output and Interrupt: Input-Output Configuration, Input- Output Instructions, Program Interrupt, Interrupt cycle		
Method of Assessment	Paper pen test		
Course Outcome 2	Outline data processing of computer system.	18	20 (06+14)
Learning Outcome 1	Express different CPU Organization and instruction formats.	06	06 (TW)
Contents	 CPU organization: General register organization, stack organization(reverse polish notation) Addressing modes: Implied mode, Immediate, register, register indirect, Auto increment or auto decrement Mode, direct, indirect, relative and indexed. Instruction format: Three address, two address, one address and Zero address 		

Learning Outcome 2	Explain Data transfer and manipulation.	12	14
Contents	 Data transfer and manipulation: Data Transfer Instructions, Data Manipulation Instructions (Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions) Program Control: Status Bit Conditions, Conditional Branch Instructions, Subroutine Call and Return, program interrupts Types of Interrupts (external Interrupts, internal interrupts and software interrupts) Reduced instruction set computers (RISC) and compare with Complex Instruction Set Computers (CISC). 		
Method of Assessment	Paper pen test		
Course Outcome 3	Classifydifferent methods of computer input output processing	20	18 (04+14)
Learning Outcome 1	Explain I/O interface and mode of data transfer.	08	08
Contents	 Input-output interface: I/O bus and Interface Modules, I/O vs memory bus, Isolated vs memory mapped I/O, Example of I/O Interface Mode of Data transfer: Synchronous and Asynchronous, Asynchronous data transfer using Strobe Control and Handshaking, Source - initiated strobe for data transfer, Destination-initiated strobe for data transfer, Source- initiated transfer using handshaking, Destination- initiated transfer using handshaking Asynchronous serial transfer Mode of Data Transfer B/w computer and I/O devices 		
Learning Outcome 2	Relate various types of Priority Interrupt.	06	06

Contents	• Priority Interrupt, Daisy-Chaining Priority, Parallel Priority Interrupt, Priority Encoder		
Learning Outcome 3	Draw DMA architecture.	06	04 (TW)
Contents	• DMA controller, DMA Transfer		
Method of Assessment	Paper pen test		
Course Outcome 4	Illustratevarious level of a memory hierarchy.	22	24 (10+14)
Learning Outcome 1	Describe Memory Hierarchy and types of cache memory	14	14
Contents	 Main Memory: RAM and ROM chips, Memory Address map and memory Connection to CPU. Auxiliary memory: Magnetic disks and magnetic tapes Cache memory: Direct, Associative and Set Associative mapping 		
Learning Outcome 2	Discuss the importance of virtual memory management.	08	10 (PT)
Contents	• Virtual memory: Address Space and Memory space, Address mapping using pages, Memory management hardware		
Method of Assessment	Paper pen test		

				SCHEME F	OR LEARNING	3	Branch Code		Course Code	e CO Code	LO Code	Л
KGPV		ma Wing) Bhop	Dal	OUTCOME			0	4		1	1	Format No. 4
COURSI	E NAME	COMPUTER ARCHIT	FECTUR	₹E		I			II			
CO Desc	cription 1	Interpret various ty	pe of m	icro-operation	s and instructions	•						
LO Desc	ription	Understand Register t	transfer	language and n	nicro-operations.							
	I				SCHEME OF STUE	γ						
S. No.		Learning Content		Teaching – Learning Method	Description of T- L Process	Teacl Hrs.	Pract /Tut Hrs.		LRs Rec	quired		Remarks
1	Register transfer language, Register transfer, Bus and Memory transfer Micro-operations, Types of micro-operations: Arithmetical (Binary Adder, Binary adder-subtractor, Binary Incrementor), Logical (AND, OR, X-OR, Complement) and hardware implementation. Shift (logical, circular, arithmetic)		er ary entor),	Traditional Lecture method + Handout	al Teacher will explain the		0	ł	Handouts / Books / E- Contents		NIL	
				SC	HEME OF ASSESS	/IENT						
S. No.	Method	d of Assessment	Desc	ription of Asses	sment	ximum 1arks	F	Reso	urces Requ	uired	Ех	ternal / Interna
1	Per	n Paper Test		Question Answe	er	14	Test Paper				External	
		I	ADDI	TIONAL INSTRU	ICTIONS FOR THE I	10D/ FA	CULTY (IF		Y)			

	RGPV (Diploma Wing) Bhopal			SCHEME FOR LEARNING OUTCOME		С	Branch Code	Course Co	ode CO Code	LO Code	Format No. 4
COUNSE	ENAME	COMPUTER ARCHITE	CTURE								
CO Desc	ription	Interpretvarious type	of micro-oper	rations and instruc	tions.						
LO Desci	ription	Identifythe importance	of various regi	sters.							
		·		SCHEME OF	STUDY						
S. No.		Learning Content	Teaching – Learning Method	Description of T Process		Гeach Hrs.	Pract. /Tut Hrs.	LRs R	equired		Remarks
1Computer registers: accumulator registers, data registers, address registers, program counter, stack pointer, Instruction register, memory data register, memory buffer register, input register, output register, temporary register. Common Bus System using different registers.		er,	raditiona Teacher will explain Lecture the contents and nethod + provide handout to		06	0	Handouts / Books / E- Contents		NIL		
I				SCHEME OF AS	SESSME	ENT		1			
S. No.	Metho	od of Assessment	Description of	otion of Assessment Maximum Marks Resources Required				quired	External / Inter		
1	1 Pen Paper Test		Question An	iswer / Quiz	5 (P	5 (PT) Test Paper Internal					Internal
			ADDITIONAL II	NSTRUCTIONS FOR	THE HC	DD/ FA	CULTY (IF A	NY)			

RGPV	RGPV (Diploma Wing) Bho		pal SCHEME FOR LEARNING OUTCOME			С	Branch Code	Course Code	CO Code	LO Code 3	Format No. 4
COURS	E NAME	COMPUTER ARCHI	TECTURE								
CO Des	cription	Interpretvarious ty	pe of micro-o	perations and instru	ictions.						
LO Dese	LO Description Explain Instruction cycle and types of instructions.										
		1		SCHEME C	OF STUDY						
S. No.	Lea	arning Content	Teaching – Learning Method	Description of Process	f T-L	Teac h Hrs.	Pract. /Tut Hrs.	LRs Requir	ed		Remarks
1	1Instructioncodes,StoProgramOrganizatiTimingandcontrol(Hardwiredcontrolamicro-programmedcontrolBasiccomputerInstructformat,InstructioncycleTypesofinstructionmemory-reference,registreferenceandinput-outregisters,Instructioncompleteness		Traditional Lecture metho + Handout	ure method contents and provid		9 0		Handouts / Books / E Contents		- NIL	
	1			SCHEME OF A	SSESSME	ENT		1			
S. No.	Metho	od of Assessment	Descriptio	n of Assessment	Maxin Mar		Reso	ources Required		Ex	ternal / Internal
1	Ре	en Paper Test	Quest	tion Answer	14			Test Paper			External

RGPV (Diploma Wing) Bho		opal	I SCHEME FOR LEARNING OUTCOME		Branch (Code	Course Code	e CO Code	LO Code	Format No. 4		
COURS	E NAME	COMPUTER ARC	HITECTI							1		
CO Description Interpretvarious type of micro-operations and instructions.												
LO Description Discuss Interrupt and its types.												
					SCHEME (OF STUD	Y					
S. No.	Lear	ning Content		ng –Learning lethod	Description Process		Teach Hrs.	Pract. /Tut Hrs.	LRs R	Required		Remarks
1	Interrupt Input-Ou Configura Input-Ou Program	ut-Output and errupt:Traditional Lecture method + HandoutTeacher will explain the contents and provide handout to students.ut-Output nfiguration ut-Output Instructions ogram Interrupt errupt CycleTraditional Lecture method + HandoutTeacher will explain the contents and provide handout to students.		nd	06	0	Handou / E-Con	its / Books tents	NIL			
	· · · · ·	·			SCHEME OF A	ASSESSM	ENT					
S. No.	Metho	od of Assessment	De	scription of A	ssessment	Maxir	num Marks	Resc	ources Re	quired	Ex	ternal / Internal
1	Pe	en Paper Test	C	Question Answ	/er / Quiz	C	95 (PT)		Test Pap	er		Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhop		nal contraction	I SCHEME FOR LEARNING OUTCOME		anch Code 0 4	Course Code	CO Code 2	LO Code 1	Format No. 4	
COURS	E NAME	COMPUTER ARCHIT	TECTURE							
CO Des	cription	Outline data process	sing of computer sys	tem.						
LO Deso	cription	Express different CP	U Organization and in	struction formats.						
				SCHEME OF STUDY						
S. No.	Lea	arning Content	Teaching –Learning Method	Description of T-L Process	Tea ch Hrs	Pract. /Tut Hrs.	LRs Requi	red		Remarks
1	register organizat notation) Addressi mode, register incremen Mode, di and indez Instructio	organization, stack ion(reverse polish ng modes: Implied Immediate, register, indirect, Auto- t or auto-decrement irect, indirect, relative	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	06	0	Handouts / Be E-Contents	ooks /	NIL	

Image: Second system Image: Second system <td< th=""><th>1</th><th>Assignment/Quiz</th><th>Question Answer / Quiz</th><th>06(TW)</th><th>Test Paper</th><th>Internal</th></td<>	1	Assignment/Quiz	Question Answer / Quiz	06(TW)	Test Paper	Internal
SCHEME OF ASSESSMENT	S. No.	Method of Assessment	Description of Assessment		Resources Required	External / Internal
			SCHEME OF A	ASSESSMENT		

RGPV (Diploma Wing) Bhopal		SCHEME FOR LEARNING) E	Branch Code	Course Co	de CO Code	LO Code		
NOF V	KOPV (Diploma willy) bilopai		OUTCOME			0 4		2	2	Format No. 4
COURS	E NAME	COMPUTER ARCHITECT								
CO Description Outline data processing of computer system.										
LO Desc	cription	Explain Data transfer and manipulation.								
		I		SCHEME OF STUD	Y					
S. No.		Learning Content	Teaching -Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs R	equired		Remarks

1	Data transfer and manipulation:	Traditional	Teacher will ex	kplain			Handouts / Books /	NIL
	Data Transfer Instructions,	Lecture	the contents a	nd	12	0	E-Contents	
	Data Manipulation Instructions	in our our .	provide hando	out to				
	(Arithmetic Instructions, Logical and		students.					
	Bit Manipulation Instructions, Shift		Teacher will co	onduct				
	Instructions)		quiz to make s	tudents				
	Program Control: Status Bit		practice their					
	Conditions, Conditional Branch		knowledge					
	Instructions, Subroutine Call and		Ū,					
	Return, program interrupts Types of Interrupts (external Interrupts,							
	internal interrupts and software							
	interrupts)							
	Reduced instruction set computers							
	(RISC) and compare with Complex							
	Instruction Set Computers (CISC).							
			SCHEME OF	ASSESSM	ENT			1
S. No.	Method of Assessment Des	scription of A	ssessment	Maxir Mai		Re	sources Required	External / Internal
1	Pen Paper Test	Question A	nswer	14	1		Test Paper	External
	ADI	DITIONAL INS	STRUCTIONS FO	OR THE HO	OD/ FAC	ulty (if an	IY)	

	ma Wing) Dhanal	SCHEME FOR LEARNING	Branch Code	Course Code	CO Code	LO Code	
	oma Wing) Bhopal	OUTCOME	c 0 4		3	1	Format No. 4
COURSE NAME	COMPUTER ARCHITECT	JRE					
CO Description	Classifydifferent method	s of computer input output processing.					
LO Description	Explain I/O interface and I	node of data transfer.					

			SCHEME (OF STUDY			
S. No.	Learning Content	Teaching – Learning Method	Description Process		Pract. /Tut Hrs.	LRs Required	Remarks
1	Input-output interface: I/O bus a Interface Modules, I/O vs memory bus, Isolated vs memory mapp I/O, Example of I/O Interface Mode of Data transf Synchronous and Asynchrono Asynchronous data transfer us Strobe Control and Handshakin Source -initiated strobe for d transfer, Destination-initia strobe for data transfer, Sour initiated transfer, us handshaking, Destination initiated transfer us handshaking Asynchronous serial transfer mode of Data Transfer B/w computer and I/O devices	bry Lecture method + Handout Handout ng ng, ata ted ce- ng on-	Teacher will ex the contents a provide hando students. Teacher will co quiz to make students pract their knowledg	nd 08 ut to nduct	0	Handouts / Books / E- Contents	NIL
		I	SCHEME OF	ASSESSMENT			
S. No.	Method of Assessment	Description of <i>I</i>	Assessment	Maximum Marks	Resou	rces Required	External / Internal
1	Pen Paper Test	Question A	Answer	08	T	est Paper	External

 RGPV (Diploma Wing) Bhopal
 SCHEME FOR LEARNING
 Branch Code
 Course Code
 CO Code
 LO Code
 Format No.
 4

				OUTCOME		C	0 4		3	2	
COURS	E NAME	COMPUTER AR	CHITECTURE			ł			<u> </u>		
CO Des	cription	Classifydifferen	t methods of compute	r input output	proces	sing.					
LO Desc	ription	Relate various ty	pes of Priority Interrup	t.							
	SCHEME OF STUDY										
S. No.	Learr	ning Content	Teaching –Learning Method	Description Process		Teach Hrs.	Pract. /Tut Hrs.	LRs Re	equired		Remarks
1	Daisy-Cha Parallel Pr Priority Er	iority Interrupt hisy-Chaining Priority rallel Priority Interrupt iority Encoder terrupt Cycle		' Books / E-	NIL						
				SCHEME OF	ASSESSI	MENT	1				
S. No.	Method	d of Assessment	Description of A	ssessment		kimum larks	F	Resources Re	equired		External / Internal
1	Per	n Paper Test	Question A	ion Answer		06 Test Paper		Test Paper			External
	l		ADDITIONAL INS								

 RGPV (Diploma Wing) Bhopal
 SCHEME FOR LEARNING
 Branch Code
 Course

				OUTCOME		C	0 4		3	3	
COURS	E NAME	COMPUTER AR	CHITECTURE						I	<u> </u>	
CO Des	cription	Classifydifferen	t methods of compute	r input output	proces	sing					
LO Des	cription	Draw DMA arch	itecture.								
	SCHEME OF STUDY										
S. No.	Lear	ning Content	Teaching –Learning Method	Description Process		Teach Hrs.	Pract. /Tut Hrs.	LRs Re	quired		Remarks
1	DMA: DMA controller, DMA Transfer		Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.		06	0	Handouts / Books / E- Contents		- NIL	
				SCHEME OF	ASSESSI	MENT					
S. No.	Metho	od of Assessment	Description of A	ssessment	-	timum arks	R	esources Re	quired		External / Internal
1	ŀ	Assignment	Question Ansv	ver / Quiz	/ Quiz 04(TW) Test Paper		Test Paper			Internal	
	ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)										

				OUTCOME		С	0	4				4	1	
COURS	E NAME	COMPUTER ARCHITE	CTURE											
CO Des	cription	Illustratevarious level	of a memory hi	erarchy.										
LO Des	cription	Describe Memory Hiera	archy and types of	f cache memory	•									
		1		SCHEME O	F STUD	Y								
S. No.	L	earning Content	Teaching – Learning Method	Description o Process		Teac h Hrs.	Prac /Tut H		LI	Rs Re	quired			Remarks
1	chips, M memory Auxiliary disks and Cache m	emory: RAM and ROM emory Address map and Connection to CPU. y memory: Magnetic I magnetic tapes emory: Direct, ive and Set Associative	Traditional Lecture method + Handout	Teacher will exp the contents an provide handou students. Teacher will cor quiz to make stu practice their knowledge	d t to nduct	14	0	Handouts / Books / E- Contents			E-	NIL		
				SCHEME OF A	SSESSM	ENT								
S. No.	Met	hod of Assessment	Description of	Assessment	Maxii Ma			Re	esourc	es Re	quired			External / Internal
1		Pen Paper Test	Question	Answer	14	4		Test Paper					External	
	-		ADDITIONAL INS	TRUCTIONS FO	R THF H	OD/FA	Υ ΕΛΛΙΗ ΤΥ (ΙΕ ΑΝΙΥ)							

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING	Branch Code	Course Code	CO Code	LO Code	Format No. 4	
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				DUTCOME		С	0 4		4	2	
COURS	E NAME	COMPUTER ARC	CHITECTURE							<u> </u>	
CO Des	cription	Illustratevarious	level of a memory hie	erarchy.							
O Des	cription	Discuss the impo	rtance of virtual memor	ry management	•						
				SCHEME (OF STUD	Y					
S. No.	Lear	ning Content	Teaching –Learning Method	Description Process		Teach Hrs.	Pract. /Tut Hrs.	LRs Ro	equired		Remarks
1	Space an Address pages	management	Traditional Lecture method + Handout	Teacher will ex the contents ar provide handor students. Teacher will co quiz to make students practi their knowledg	nd ut to nduct ce	08	0	Handouts Contents	/ Books / E-	NIL	
				SCHEME OF A	ASSESSIM	IENT					
S. No.	Metho	d of Assessment	Description of A	ssessment	Maxi Ma	mum Irks	F	Resources R	equired		External / Internal
1	Ре	n Paper Test	Question Answ	/er / Quiz	10(PT)		Test Paper			Internal
			ADDITIONAL INS								

RGPV	(DIPL	oma v	/ING) BHOPAL	O	BE CURRICULUM FOR THE COURSE			Sheet No. 1/3	
Branch		ENG	COMPUTE COMPUTE		CE AND DNTECHNOLOGY	Sem	ester		ſhird
Course	Code		304	Course Name	DATA STRUCTURE AND ALG	ORIT	ΉМ		
					<u>.</u>		Teachin Hrs	g	Marks
Cours	e Outc	come 1			STRUCTURES, POINTERS & DYNAMIC MEMORY EN PROBLEM SITUATION.		30		34
Learni	ng Out	tcome 1	EXPLAIN DATA T` AND DYNAMIC M		BSTRACT DATA TYPES (ADT), POINTERS, STRUCTUR	E	14		14
C	ontent	S			Data Types and Data-Structure. c ture: Linear, Non-Linear, Primitive, Non-Primitive, etc.				
					aring and initializing pointers, Accessing variables using Array of Pointers, Row-major & Col-major implementati				
			Structure: Defini Array of Structure,		laration, Initializing Structure, Accessing Structure ele o Structure.	ments	,		
			Dynamic Memory	Allocati	on/Deallocation: malloc(), calloc(), free(), realloc().				

Learning Outcome 2	INTERPRET STRUCTURE & POINTERS, DYNAMIC MEMORY ALLOCATION AND DE- ALLOCATION.	08	10
Contonto	Pointers and constant pointer self referential structures, Dynamic structures, Comparative Study of Union & Structure.		
Learning Outcome 3	USE STRUCTURE & POINTERS FOR A GIVEN PROBLEM SITUATION.	08	10
Contents	Invoking functions by passing the pointers, Declaration and use of structure.		
Method of Assessment	LO - 1 Paper pen test (End semester Exam) LO - 2 Paper pen test (Progressive test - I) LO - 3 Lab Assessment (External)		
	USE SEARCHING/SORTING & HASHING TECHNIQUES TO SOLVE REAL WORLD PROBLEMS.	34	34
Learning Outcome 1	EXPLAIN COMPLEXITY ANALYSIS AND VARIOUS SEARCHING, SORTING & HASHING TECHNIQUES.	12	14
Contents	Basics of algorithm, Analysis of an Algorithm, Asymptotic Notation: O-Notation, Ω -Notation and θ -Notation.		
	Searching Techniques: Linear search and Binary search. Sorting Techniques: Insertion sort, Selection sort, Bubble sort, Merge sort, Radix sort.		

	Hashing: Hash Table & Hash Function, different hashing techniques and linear probing collision technique.		
	Different operations in hashing- Search, Insert & Delete.		
Learning Outcome 2	WRITE PROGRAM FOR LINEAR SEARCH & BINARY SEARCH TECHNIQUES.	08	10
Contents	Algorithm of linear search and binary search technique.		
Learning Outcome 3	WRITE PROGRAM FOR SORTING TECHNIQUES.	14	10
Contents	Algorithm of insertion sort and bubble sort.		
Method of Assessment	LO - 1 Paper pen test (End semester Exam) LO - 2 Lab Assessment (External) LO - 3 Lab Assessment (External)		
Course Outcome 3	APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.	40	48
Learning Outcome 1	EXPLAIN THE BASIC STRUCTURE OF LINKED LIST WITH ITS VARIOUS OPERATIONS.	10	14
Contents	Terminologies: Node, Data field, Link field, Null pointer, External pointer, Empty list. Memory Representation of Linked List and Comparison between Linked List & Array.		
	Operation(s) on Linked List: Create, Insert, Delete, Traverse, Search, and Display.		
	Types of Linked List: Singly Linked List, Doubly Linked List, Circular Linked List, Circular		

	Doubly Linked List.		
	Polynomial Representation, Addition and multiplication of Two Polynomials.		
Learning Outcome 2	ILLUSTRATE STACK AND QUEUE DATA STRUCTURE.	08	10
Contents	Stack: Introduction to Stack, Stack Operation- PUSH, POP, Stack as an Array, Stack as a Linked List(Linked stack).		
	Queue: Introduction to Queue, Queue Operation- Insertion & Deletion, Queue as an Array.		
Learning Outcome 3	APPLY LINEAR DATA STRUCTURE TO SOLVE STACK'S & QUEUE'S PROBLEMS.	10	14
Contents	Application of Stack:		
	Reversal of given line, Polish Notations, Infix to Postfix Conversion, Evaluation of Postfix Notation.		
	Types of Queue & Application: Simple Queue, Circular Queue & Double Ended Queue, Application of Queue.		
Learning Outcome 4		12	10
	USE ARRAY AND LINKED LIST FOR STACK'S AND QUEUE'S FUNCTIONS.		
Contents	Perform various operations on stack like insertion (PUSH) & deletion (POP). Perform various operations on queue like insertion and deletion.		
Method of Assessment	LO - 1 Paper pen test (End Semester Exam) LO - 2 Paper pen test (Progressive test - II) LO - 3 Paper pen test (End Semester Exam) LO - 4 Lab Assessment (Internal)		
L			<u> </u>

Course Outcome 4	ILLUSTRATE NON-LINEAR DATA STRUCTURE.	31	34
Learning Outcome 1	DIFFERENTIATE VARIOUS TYPES OF BINARY TREE.	13	14
Contents	Terminologies: Root node, Terminal node, Non-Terminal node, Degree of a node, Degree of a tree, Siblings, Depth, Level, Path, Sub tree, Forest.		
	Types of Tree: Binary Tree, Complete Binary Tree, Strictly Binary Tree, Expression Tree, Binary Search Tree, AVL Tree, Threaded Binary Tree.		
	Tree Traversal: In-order, Pre-order and Post-order.		
Learning Outcome 2	EXPLAIN MINIMUM SPANNING TREE AND DIFFERENT TYPES OF GRAPH WITH REPRESENTATION.	10	10
Contents	Graph: Introduction to Graph, Graph Vs Tree, Vertex, Edge, Adjacent Vertex, Connected Graph, Simple Graph, Weighted Graph, Complete Graph And Directed Graph.		
	Graph Traversal: Breadth First Search, Depth First Search.		
	Graph Representation: Adjacent Matrix, Adjacency List Representation.		
	Minimum Spanning Tree: Kruskal's & Prim's Techniques.		
Learning Outcome 3	WRITE AN ALGORITHM FOR TREE & GRAPH TRAVERSAL.	8	10
Contents	Algorithm of in-order, preorder and post order traversal of tree.		

Algorithm to traverse a graph using Breadth First Search and Depth First Search.	
LO - 1 Paper pen test (End Semester Exam) LO - 2 Paper pen test/Assignment: Term Work (Internal) LO - 3 Lab Assessment (Internal)	

R	GPV (Di	ploma Wing)	SCHEME FOR I	LEARNING	В	ranch Cod	e	Course	Code	CO Code	LO Code	Format No.
	-	hopal	Ουτςο	ME	С	0	4 3	3 0	4	1	1	4
COURS	SE NAME	Data structure and algorit	nms			11	I					1
CO-1 Descrip	tion	APPLY BASICS OF DATA SITUATION.	STRUCTURES, POI	INTERS & DYNA	MIC	MEMO	DRY M	ANAGI	EMEN	T IN .	A GIV	EN PROBLE
LO-1 Descrip	tion	EXPLAIN DATA TYPES & AI	BSTRACT DATA TYP	ES (ADT), POINTER	RS, ST	RUCTU	URE AN	D DYN	AMIC	MEMO	ORY.	
			SCHE	ME OF STUDY								
S. No.		Learning Content	Teaching – Learning Method	Description of T-L Process		each Irs.		t. /Tut Irs.	LR	s Requ	uired	Remarks
1.1	and Data-S Classifica Linear, N Primitive, Pointers: initializing variables u arithmetic major & C 2-D array. Structure Initializing Structure Pointer to Dynamic Allocation	tion of Data Structure: Ion-Linear, Primitive, Non- etc. Introduction, Declaring and g pointers, Accessing using pointers, Pointer , Array of Pointers, Row- col-major implementation of : Definition, Declaration, g Structure, Accessing elements, Array of Structure,	Traditional Lecture method + Handout	Teacher will explain the contents and provide handouts to students.	14					ndout		

	SCHEME OF ASS	ESSMENT		
Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
Paper pen test(End Semester Exam)	Students will be asked to explain data types, structure, pointer, 2-D Array, Memory allocation de-allocation and apply these concepts for a given problem.	14	Test Paper	External
	ADDITIONAL INSTRUCTIONS FOR	THE HOD/ FACULTY (IF	ANY)	
	ADDITIONAL INSTRUCTIONS FOR T	THE HOD/ FACULTY (IF	ANY)	
	Paper pen test(End	Method of AssessmentDescription of AssessmentPaper pen test(End Semester Exam)Students will be asked to explain data types, structure, pointer, 2-D Array, Memory allocation de-allocation and apply these concepts for a given problem.	Method of AssessmentDescription of AssessmentMaximum MarksPaper pen test(End Semester Exam)Students will be asked to explain data types, structure, pointer, 2-D Array, Memory allocation de-allocation and apply 	Method of AssessmentDescription of AssessmentMaximum MarksResources RequiredPaper pen test(End Semester Exam)Students will be asked to explain data types, structure, pointer, 2-D Array, Memory allocation de-allocation and apply14Test Paper

	(Dinlor	na Wing) Bhoj	SCHEME I	OR LEARNIN	IG	Branch Code	Cour	se Code	CO Code	LO Code	<u>е</u> с л. Л
			OU	ITCOME	С	0 4	3	0 4	1	2	Format No. 4
COUR	SE NAME	Data structure an	d algorithms								
CO Des	cription	APPLY BASICS (SITUATIONS.	OF DATA STRUCTUR	ES, POINTERS &	DYNAMI	C MEMORY	MAN	AGEME	NT IN	A (GIVEN PROBLEM
LO Desc	cription	INTERPRET STRUC	TURE & POINTERS, DY	NAMIC MEMORY	ALLOCATI	ON & DE-AL	LOCAT	ION.			
				SCHEME OF STU	IDY						
S. No.	Lea	rning Content	Teaching – Learning Method	Description of T-L Process	Teach Hr	rs. Pract. / Hrs	·	LRs	Requir	ed	Remarks
1.2	self ref Dynamic st	d constant pointer, ferential structure ructures, re Study of Union		Teacher will explain the contents and provide handouts to students.	08	-		Handou	ıt		
			S	CHEME OF ASSESS	SMENT						
S. No.	Method	of Assessment	Description of Assessment	Maximum M	arks	Re	source	s Requi	red		External / Internal
	Paper pen (Progressiv	test ve test -1)	Student will be asked o interpret structure nd pointer, Union & tructure, Memory llocation & De-alloc.	10			Test	Paper			Internal
			ADDITIONAL INSTR	UCTIONS FOR THE	HOD/ FAC	CULTY (IF AN	IY)				

				SCH	EME FOR LEAF	RNING	Brai	nch Code	Course Code	CO Code	LO Code			
RGPV	(Diplon	na Wing)	Bhopal		OUTCOME		С	0 4	3 0 4	0 4 1 3		Format No. 4		
COUR	SE NAME	Data struct	ure and algo	orithms					I	-	_			
CO-1 D	escription	APPLY BAS SITUATIONS		TA STRU	UCTURES, POINTE	RS & DYN	NAMIC N	MEMORY N	IANAGEME	NT IN	A G	VEN PROBLEN		
LO-3 De	escription	USE STRUCT	URE & POIN	TERS FOF	R A GIVEN PROBLEM	SITUATIO	N.							
		1			SCHEME (OF STUDY								
S. No.	Learnin	g Content	Teachi Learning I	•	Description of T-I	Process	Teach Hrs.	Pract. /T Hrs.	ut LRs	Requir	ed	Remarks		
1.3	Invoking functions by passing the pointers, Declaration and use of structure.		Invoking functions by passing the pointers, Declaration and use ofTraditional method		Traditional Lo method	ecture Teacher will explain t contents and provide manual to the studer Teacher will provide practice to apply poir structures in a given		a Lab ts. guided iters and	-	8	Lab Manual			
	•				SCHEME OF A	SSESSMEI	NT	·	· · · ·					
S. No.	Method	of Assessmer	nt De	escription	of Assessment	Maxim Mark	-	Reso	urces Requi	red		External / Internal		
	Lab Assess	sment	program		sked to execute a ate the use of nter.	10			Lab manual			External		
			AD	DITIONA	L INSTRUCTIONS FO	R THE HO	D/ FACUI	TY (IF ANY)						

	/ (Dinlor	na Wing) Bhor	SC	CHEME FOR LEA	ARNING	Branch Code	Course Code	CO Code	LO Code	Format No.	
				OUTCOM	E C	0 4	3 0 4	2	1	Format No.	
COUR	SE NAME	Data structure and	d algorithm	s							
CO-2 D	escription	USE SEARCHING, S	ORTING &	HASHING TECHNIQ	UES TO SOLVE RE	AL WORLD I	PROBLEMS.				
LO-1 De	escription	EXPLAIN COMPLEX	ITY ANALY	SIS AND VARIOUS SE	EARCHING, SORTIN	G & HASHING	G TECHNIQUE	ES.			
		1		SCHEME	OF STUDY						
S. No.		Learning Content		Teaching – Learning Method	Description of T- Process	L Teach Hrs.	Pract. /Tut Hrs.	LRs Re	equired	Remark	
2.1	 Learning Content Basics of algorithm, Analysis of an Algorithm, Asymptotic Notation: O- Notation, Ω-Notation and θ-Notation. Searching Techniques: Linear search and Binary search. Sorting Techniques: Insertion sort, Selection sort, Bubble sort, Merge sort, Radix sort. Hashing: Hash Table & Hash Function, different hashing techniques and linear probing collision technique. Different operations in hashing- Search, Insert & Delete. 		O- tion. earch and ort, e sort, nction, linear	and Traditional Lecture Teacher will end the contents approvide hand students.		12		Handout			
				SCHEME OF	ASSESSMENT						
S. No.	Method	of Assessment	Descripti	on of Assessment	Maximum Marks	Res	ources Requ	ired		/ External Internal	

End Semester Exam	 Student will be asked to write and analyze space and time complexity of given algorithms. differentiate between linear and binary search. Illustrate various sorting techniques. describe hashing techniques. 	14	Test Paper	External
	ADDITIONAL INSTRUCTIONS FOR	THE HOD/ FACUI	LTY (IF ANY)	

	GPV (Diploma Wing) Bhopa	SCHEME FOR LEARNING	В	Branch Code			Branch Code Cou			Course Code			LO Code	Л
RGPV (Diplor	ia wing j Bhopai	OUTCOME	С	0	4	3	0	4	2	2	Format No. 4			
COURSE NAME	Data structure and algo	orithms							,					

CO-2 D	escription	USE SEARCHIN	G/SORTING & HASHIN	G TECHNIQUE	CS TO SC	OLVE RE	AL WORLD	PROBLEMS.	
LO-2 De	escription	WRITE PROGRA	M FOR LINEAR SEARCH	I & BINARY SE	ARCH TI	ECHNIQU	JES.		
		1		SCHEME		ργ			
S. No.	Learn	ing Content	Teaching –Learning Method	Description Proces		Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
2.2	-	of linear search search technique.	Traditional Lecture method + Handout	Teacher will exp contents and pr handout to stuc	ovide	-	08	Handout	
				SCHEME OF A	ASSESSI	ЛЕNT			
S. No.	Method	l of Assessment	Description of A	ssessment	_	imum arks	R	esources Required	External / Internal
	Lab asses	sment	Students will be asked t program for linear sear search technique for a g	ch and binary	10			Lab Manual	External
			ADDITIONAL INS	TRUCTIONS FO	DR THE I	HOD/ FA	CULTY (IF A	NY)	

	- Mina) Dhanal	SCHEME FOR LEARNING	В	ranch Co	de	C	ourse Co	de	CO Code	LO Code	Л
RGPV (Diplom	na Wing) Bhopal	OUTCOME	С	0	4	3	0	4	2	3	Format No. 4
COURSE NAME	Data structure and algo	prithms									

CO-2 D	escription	USE SEAR(CHING/SORTING &	HASHING TECHNIQU	ES TO SOLVE	REAL WOF	RLD PROBLEM	IS.	
LO-3 D	escription	WRITE PRO	OGRAM FOR SORTIN	G TECHNIQUES.					
		·		SCHEME	OF STUDY				
S. No.	Learning	g Content	Teaching – Learning Method	Description of T-	L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
2.3	Algorithm o sort, inserti- technique.		Traditional Lecture method	provide Lab Manual to s Teacher will provide a g	er will explain the contents and de Lab Manual to students. er will provide a guided Practice te an algorithm of bubble sort , ion sort.		14	Lab manual	
				SCHEME OF	ASSESSMENT				
S. No.	Method	of Assessme	ent Descript	ion of Assessment	Maximum Marks		Resources R	equired	External / Internal
	Lab Asses	sment		e asked to implement rting Techniques.	10		Lab Mar	nual	External

			ADD	ITION	AL INSTRUCTIONS F	OR THE HOD	′ FACU	LTY (IF A	NY)					
RGP	/ (Diplor	na Wing) Bh	opal	SC	HEME FOR LEA		Bra	anch Code	Сс З	ourse Code	le ,	CO Code 3	LO Code 1	Format No. 4
COUR		Data structure a	and algori	ithms				v 4				9	-	
	escription				R DATA STRUCTU	RE IN PROBL	EM SC	DLVING.						
	escription	EXPLAIN THE BA	SIC STRU	CTUR	E OF LINKED LIST W	/ITH ITS VARIO	DUS OP	PERATION	IS.					
	-				SCHEME	OF STUDY								
S. No.		Learning Conter	nt		Teaching – Learning Method	Description Process		Teach Hrs.		act. : Hrs.	LRs	Req	uired	Remarks
3.1	Null pointer Memory R Comparison Operation Delete, Trav Types of Li Doubly Lin Circular Do Polynomial	gies: Node, Data field, c, External pointer, En epresentation of Link between Linked List s) on Linked List: Cr verse, Search, and Dis nked List: Singly Linked List, Circular Linhubly Linked List. Representation, Addition on of Two Polynomia	npty list. ed List and & Array. reate, Insert play. nked List, ked List, tion and		Traditional Lecture method + Handout	Teacher will ex the contents an provide handor students.	nd	10			Hand			
					SCHEME OF	ASSESSMEN	Γ							
S. No.	Method	of Assessment	Desc	criptic	on of Assessment	Maximur Marks	n	R	esourc	es Re	quirec	ł		External / Internal
	Paper per semester			of Link	asked to Define the bas and List & Perform ons of it.	ic 14			Tes	st pape	er			External

										1			1
RGPV (Diploma Wing) Bhopal SCHEN					E FOR LEARNING			Course Code		e	CO Code	LO Code	
(Dipion	ha wing) Bi	nopai	C	OUTCOME			0 4	3	0	4	3	2	Format No. Z
E NAME	Data structure	and algo	orithms				I		!				1
cription	APPLY APPROI	OPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.											
cription	ILLUSTRATE ST	TACK AND	O QUEUE DATA	STRUCTURE.									
				SCHEME OF	STUD	ΟY							
Learni	ng Content	g Content		Description of Process	T-L	Teach Hrs.	Pract. /Tut Hrs.	LRs Required			d		Remarks
 Stack: Introduction to Stack, Stack Operation- PUSH, POP, Stack as an Array, Stack as a Linked List(Linked stack). Queue: Introduction to Queue, Queue Operation- Insertion & Deletion, Queue as an Array. 		tion- as an inked Traditional Lecture the content method + Handout provide h students.		the contents and		08	-	Hand out					
				SCHEME OF AS	SESSN	ΛΕΝΤ							
Method of Assessment		Description of Assessment			-	-	Re	es Re	quire	External / Internal			
Paper pen test (Progressive test -II)			Students will be asked to illustrate stack, queues and it's operations and implement stack and queue using array and linked list.			10	Test paper						Internal
	cription cription Learnin tack: Intro- tack, Stach USH, POI Array , Stach USH, POI Array , Stach ist(Linked Queue: Intro Queue, Que insertion & Queue as an Method	CriptionAPPLY APPROICriptionILLUSTRATE STLearning ContentEtack: Introduction to Ottack, Stack Operation- PUSH, POP, Stack as an Array, Stack as a Linked List(Linked stack).Queue, Queue Operation- nsertion & Deletion, Queue as an Array.Method of AssessmentPaper pen test	criptionAPPLY APPROPRIATE LcriptionILLUSTRATE STACK ANDLearning ContentTeachingLearning ContentTraditionatack: Introduction to btack, Stack Operation- PUSH, POP, Stack as an Linked dist(Linked stack). Queue, Queue Operation- nsertion & Deletion, Queue as an Array.Traditiona method +Method of AssessmentDeletion, Stude stack andDeletion, and	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA Cription ILLUSTRATE STACK AND QUEUE DATA Learning Content Teaching –Learning Method Learning Content Traditional Lecture method + Handout VISH, POP, Stack as an Array , Stack as a Linked List(Linked stack). Traditional Lecture method + Handout Queue: Introduction to Queue, Queue Operation- nsertion & Deletion, Queue as an Array. Description of A Method of Assessment Description of A Students will be ask stack, queues and i and implement sta	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE I Scription ILLUSTRATE STACK AND QUEUE DATA STRUCTURE. Scheme Scheme Learning Content Teaching –Learning Method Description of Process Stack: Introduction to track, Stack Operation- USH, POP, Stack as an urray , Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Teacher will explating the contents and provide handout is students. Queue: Introduction to Queue, Queue Operation- nsertion & Deletion, Queue as an Array. Scheme OF Assessment Method of Assessment Description of Assessment Students will be asked to illustrate stack, queues and it's operations and implement stack and queue	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROpriate LINEAR DATA STRUCTURE. Schemen Structure Schemen Structure Learning Content Teaching –Learning Method Description of T-L Process Learning Content Traditional Lecture method + Handout Teacher will explain the contents and provide handout to students. USH, POP, Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Scheme Students. Method Scheme Students. Scheme Students. Maximum Students. Method of Assessment Description of Assessment Maximum Students and progressive test -II) Students will be asked to illustrate stack and queue	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM cription ILLUSTRATE STACK AND QUEUE DATA STRUCTURE. Learning Content Teaching –Learning Method Description of T-L Process Teach Hrs. tack: Introduction to ttack, Stack Operation- USH, POP, Stack as an urray , Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Teacher will explain the contents and provide handout to students. 08 Description of X- USH, POP, Stack as an urray , Stack as a Linked ist(Linked stack). Description of Assessment Maximum Marks Deueue introduction to Queue as an Array. Description of Assessment Maximum Marks Method of Assessment Students will be asked to illustrate stack, queues and it's operations and implement stack and queue 10	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING. Irription ILLUSTRATE STACK AND QUEUE DATA STRUCTURE. SCHEME OF STUDY SCHEME OF STUDY Learning Content Teaching -Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. itack: Introduction to track, Stack Operation- USH, POP, Stack as an urray , Stack as a Linked dist(Linked stack). Traditional Lecture method + Handout Teacher will explain the contents and provide handout to students. 08 - Venue: Introduction to Queue, Queue Operation- method beletion, Queue as an Array. Description of Assessment Maximum Marks Ref Method of Assessment Description of Assessment stack, queues and it's operations and implement stack and queue 10	Image: Concenter of the content of	Image: Construction of the second structure and algorithms Image: Construction of the second structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING. It.LUSTRATE STACK AND QUEUE DATA STRUCTURE. SCHEME OF STUDY Learning Content Teaching -Learning Method Description of T-L Process Teach Hrs. Pract. /Tu Hrs. LRs Register itack: Introduction to ttack, Stack Operation- USH, POP, Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Teacher will explain provide handout to students. 08 - Hand out Description of Dueue, Queue Operation- bueue as an Array. Scheme OF Assessment Maximum Marks Resources Register Method of Assessment Description of Assessment stack, queues and it's operations and implement stack and queue 10 Test pape	Image: Name of the content of the c	Image: NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING. stription ILLUSTRATE STACK AND QUEUE DATA STRUCTURE. Learning Content Teaching -Learning Method Description of T-L Process Teach Hrs. Pract. /Tut Hrs. LRs Required Learning Content Teaching -Learning Method Description of T-L Process Teach Process Teach Hrs. Pract. /Tut Hrs. LRs Required itack: Introduction to ttack, Stack Operation- USH, POP, Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Teacher will explain the contents and provide handout to students. 08 - Hand out Description of Dueue: Introduction to Dueue, Queue Operation- nsertion & Deletion, Queue as an Array. Description of Assessment Maximum Marks Resources Required Method of Assessment Students will be asked to illustrate stack, queues and it's operations and implement stack and queue 10 Test paper	NAME Data structure and algorithms Cription APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING. cription ILLUSTRATE STACK AND QUEUE DATA STRUCTURE. SCHEME OF STUDY SCHEME OF STUDY Learning Content Teaching -Learning Method Description of T-L Process Pract. Hrs. Pract. /Tut Hrs. LRs Required tack: Introduction to tack, Stack Operation- USH, POP, Stack as a Linked ist(Linked stack). Traditional Lecture method + Handout Teacher will explain the contents and provide handout to students. 08 - Hand out Hand out Description & Deletion, Dueue as an Array. SCHEME OF ASSESSMENT Maximum Marks Resources Required Method of Assessment Description of Assessment Maximum Marks Resources Required Paper pen test Progressive test -III) Students will be asked to illustrate stack, queues and it's operations and implement stack and queue 10 Test paper

RGPV (Diploma Wing) Bhopal			, S	CHEME FOR LEA	Branch Code	e Course	Code	LO Code							
			OUTCOM	C 0	4 3 0	3 0 4 3		3	Format No. 4						
COUR	SE NAME	Data structure an	d algorithm	thms											
CO-3 D	escription	APPLY APPROPRIA	ATE LINEA	R DATA STRUCTUR	RE IN PROBLE	M SOLVIN	IG.								
LO-3 De	escription	APPLY LINEAR DAT	ΓΑ STRUCTU	JRE TO SOLVE STACK	'S & QUEUE'S P	ROBLEMS.									
				SCHEME	OF STUDY										
S. No.	Learning Content			Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LR	s Requ	iired	Remarks				
3.3 Application of Stack: Reversal of given line Polish Notations, Infix to Postfix Conversion, Evaluation of Postfix Notation. Types of Queue & Application: Simple Queue, Circular Queue & Double Ended Queue, Application of Queue.			Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	10	-	Hand								
				SCHEME OF	ASSESSMENT										
S. No.	Method	of Assessment	Descript	ion of Assessment	Maximum Marks		Resources Required								
	semester Exam) stack and queu			ill be asked to apply ieue data structure fo iven problem.	or 14		Test P	aper			External				
			ADDITIO	NAL INSTRUCTIONS I	OR THE HOD/ I	FACULTY (I	F ANY)								

RGPV (Diploma Wing) Bhopal			mal	SCHEME FOR L	Branch Cod	le Course (Code	CO Code	LO Code		
			раг	OUTCOM	C 0	4 3 0	4	3	4	Format No. 4	
COUR	SE NAME	Data structure an	d algo	rithms				<u> </u>	i		
CO-3 D	escription	APPLY APPROPRIA	ATE LI	NEAR DATA STRUCT	URE IN PROBL	EM SOLVI	NG.				
LO-4 De	escription	USE ARRAY AND L	INKED	LIST FOR STACK'S AND	QUEUE'S FUNCT	TIONS.					
				SCHE	ME OF STUDY						
S. No.	l	earning Content		Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs I	LRs Required		Remarks
3.4	Perform various operations on stack like insertion (PUSH) & deletion (POP). Perform various operations o queue like insertion and deletion.			Traditional Lecture method	Teacher will expla the contents and provide Lab Manual to students.	in -	12	Lab N	Manua		
				SCHEME	OF ASSESSMEN	Г					
S. No.	Method of Assessment De			scription of Assessment	: Maximu Marks	n	Resources F	equire		External / Internal	
	Lab Asses	sment	and c and	ents will be asked to inse delete elements in a sta- queue, perform various perations in linked list.	ck 10		Lab Ma		Internal		
					IS FOR THE HOD	/ FACULTY (IF ANY)				

		. SCHEMF	SCHEME FOR LEARN			Branch Code		Co	ourse C	ode	e CO Code C			
RGPV	(Diplom	na Wing) Bhop	pal C	OUTCOME			0	4	3	3 0 4		4	1	Format No.
COURS	SE NAME	Data structure and	d algorithms											
CO-4 D	Description	ILLUSTRATE NON	N-LINEAR DATA ST	ATA STRUCTURE.										
LO-1 D(Description	DIFFERENTIATE AI	MONG VARIOUS TYP	PES OF BINARY	TREE.									
		<u>.</u>		SCHEME OF	- STUDY									
S. No.		Learning Conte	tent	Teaching Learning Me	-	-	escription T-L Process		ach rs.	n Pract. /Tut Hrs.		. R	LRs equired	Remarks
4.1 Terminologies: Root node, Terminal node, Degree of a nod Siblings, Depth, Level, Path, Si Types of Tree: Binary Tree, C Strictly Binary Tree, Expressio Tree, AVL Tree, Threaded Bin Tree Traversal: In-order, P		ode, Degree of a node, D epth, Level, Path, Sub tro ree: Binary Tree, Compl nary Tree, Expression Tro Tree, Threaded Binary T	Degree of a tree, tree, Forest. plete Binary Tree, ree, Binary Search Tree.	Traditional Lectu method + Hando	ture ex lout co pi ha			the s and t to		-		На	ndout	
				SCHEME OF AS	SESSMEN	NT								
S. No.	Method	Method of AssessmentDescription of AssessmentPaper pen test (End semester Exam)For the given tree, s asked to • define basic termine • Differentiate varie Binary Tree.• insert/delete the g in the tree.			Maxim Mark	-	Resources Required							External / Internal
					14		Test paper						External	

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal		SCHEN	SCHEME FOR LEARNING			Branch Code				ode	CO Code	LO Code			
				OUTCOME	С	0	4	3	0	4	4	2	Format No.		
COURS	SE NAME	Data structure and		I		I						<u> </u>			
CO-4 D	escription	SOLVE PROBLEM	EMS INVOLVING NON-LINEAR DATA STRUCTURE.												
LO-2 D	escription	EXPLAIN MINIMUM	SPANNING TREE	E AND DIFFERENT T	YPES OF GR	RAPH	WITH	REP	RESE	ENTA'	TION.				
				SCHEME OF S	TUDY										
S. No.		Learning Content		Teaching – Learning Method	Description of T-L Process			Teach Hrs.		Pract. /Tut Hrs		LRs . Require		Remark	
 4.2 Graph: Introduction to Graph, Graph Vs Tree, Vertex, Edge, Adjacent Vertex, Connected Graph, Simple Graph, Weighted Graph, Complete Graph, Directed Graph. Graph Traversal: Breadth First Search, Depth First Search. Graph Representation: Adjacent Matrix, Adjacency List Representation. Minimum Spanning Tree: Kruskal's & Prim's Techniques. 			Traditional Lecture method + Handout	Teacher wi the conten provide ha students.	ain	10		-		H	andout				
				SCHEME OF ASSE	SSMENT										
S. No.	Method	of Assessment	Description of	Assessment	Maximum Marks			Resources Required					External Internal		

		Pen test/ ment(Term work)	 Students will be asked Explain basic term graph data structu differentiate betw search and depth Explain minimum 	hinologies of ure. ween breadth first first search.	1	.0		Handout	Internal
			ADDITIONAL INS	STRUCTIONS FO	R THE HO	OD/ FA	ACULTY (IF A	ANY)	
CO-4 Descript	tion	SOLVE PROBLI	EMS INVOLVING NO	N-LINEAR DAT	ΓA STRU	UCTU	RE.		
LO-3 Descript	tion								
		1		SCHEME OF	STUDY				
S. No.	Lear	ning Content	Teaching –Learning Method	Description o Process		Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
4.3	Learning ContentAlgorithm of in-order, preorder and post order traversal of tree.Algorithm to traverse a graph using Breadth First Search and Depth First Search.		Traditional Lecture method + Handout	Teacher will expla the contents and provide Lab Manu students.	explain s and			Lab manual	
				SCHEME OF AS	SESSME	INT			
S. No.	Metho	od of Assessment	Description of A	ssessment	Maxim Mar		Re	esources Required	External / Internal

Lab Assessment	 Student will be asked to Write tree traversal algorithms. Write graph traversal algorithm. 	10	Lab Manual	Internal
	ADDITIONAL INSTRUCTIONS FO	R THE HOD/ FA	CULTY (IF ANY)	

LIST OF EXPERIMENT

S.NO.	EXPERIMENT	СО	LO
1.	Program to swap values of two variables by passing pointers.	CO-1	LO-3
2.	Program to display information (name, roll no, cgpa etc) of students in a class using structure.		<external></external>
3.	Program to search an item from 'n' different items using i) Linear Search ii) Binary Search	CO-2	LO-2 <external></external>
4.	Program to sort 'n' real numbers using bubble sort sorting technique. OR Program to sort 'n' real numbers using insertion sort sorting technique. OR Program to sort 'n' students according to their height.		LO-3 <external></external>
5.	 i) Program to insert roll_no/name of 9 students into linked list in which first 5 will be linearly inserted at the end of list, next 3 will be inserted at the beginning of list and last student inserted at the middle of list. ii) Write a program to perform PUSH and POP operations on Stack. iii) Program to implement Simple Queue. 	CO-3	LO-4 <internal></internal>
6.	 i) Write a program to Traverse Binary Tree using i) In-Order ii) Pre-Order and iii) Post- Order Traversal Techniques. ii) Write a program to traverse a Graph using i) BFS ii) DFS 	CO-4	LO-3 <internal></internal>

RGPV (DIPLO WING) BHOP		OBE CURRICULUM FOR OPERATING SYSTEM	FORMAT-3	Sheet No. 1/3							
Branch	Com	puter Science and Engineering/Information Technology	Semester	III							
Course Code	302	Course Name	OPERAT SYSTE								
Course Outcome 1		scribe basics Concept of Operating stem and its functionality.	Hrs	Marks							
Learning Outcome 1	e Ap	ply the function and objectives of OS.	8	12							
Contents		Basics of Operating System System components and functions.									
Method of Assessment	Qu	estion Paper -External- End Sem Exam									
Learning Outcome 2		t Types of Operating System its structure I System call.	10	10							
Contents	Mu Rea OS	pes of Operating System: Batch processing, ultitasking, Multiprocessor: symmetric and a al Time, Network & Distributed OS. Structure: Monolithic, Microkernel and La stem Call.	asymmetric, Time	0							
Method of Assessment	Qu	estion Paper -Internal Progressive Test									
Learning Outcome 3		ntify the concept of BIOS Setup and ver Installation.	7	10							
	Ins	tallation, Up gradation, Troubleshooting of	Windows								
Contents		Device Driver Installation, BIOS Setup. Installation and Troubleshooting devices.									
Method of Assessment	La	Lab Manual - External-Practical									

Method of Assessment	External- End Sem Exam										
Contents	Deadlock prevention scheme. Deadlock avoidance, Banker's Algorithm. Deadlock Detection.										
Learning Outcome 2	To Evaluate the performance of Banker's algorithm.	5	10								
Method of Assessment	Question Paper –Internal Assesment- Progre	essive									
	Method for handling deadlock.										
Contents	Resource allocation graph.										
	Basic Concept of deadlock, Necessary conditio	ns for deadloc	K.								
Learning Outcome 1	Identify the various conditions of deadlock.	10	10								
Course Outcome 3	Describe Deadlock and disk management.	Hrs	Marks								
Method of Assessment	Lab Manual -Internal Practical- lab work										
Contents	Algorithms- FCFS, SJF, Priority, RR, Multileve Multilevel Feedback queue scheduling.	el queue sched	uling,								
	Scheduling criteria, Scheduling.										
Learning Outcome 2	Explain different CPU Scheduling algorithm.	10	10								
Method of Assessment											
Mathadaf	Assignment- Internal(Term work)										
Contents	Process concept, Process state diagram. Process control block. CPU Scheduler, Context Switch.										
Learning Outcome 1	Identify Process management concept 10 10										
Course Outcome 2	management concept and apply concept on given problem.	Hrs	Marks								
	Describe Computer System Processes										

Learning Outcome 3	List the type of Disk scheduling algorithms and identify RAID Technology concept.	10	10							
Contents	Disc Structure, Seek Time, Latency Time, Rota Time, and Bandwidth. Disk Scheduling Algorithm: FCFS, SSTF, Scar RAID technology definition, uses, advantages. Format disk and Create disk partition	-								
Method of Assessment	External-Practical									
Course Outcome 4	Explain concept of Memory Management	Hrs	Marks							
Learning Outcome 1	Identify Basics of Memory Management and its Schemes.	l 15								
	Goal of Memory Management, Overlays, and Swapping, Logical and									
	Physical Address, Allocation Techniques: First	Fit, Best Fit, Wo	orst Fit,							
	Contiguous Memory Allocation, Non-Contiguo	ous Memory Allo	cation.							
Contents	Fragmentation, Paging, page Table.									
	Segmentation									
	Difference between paging and segmentation									
Method of Assessment	External- End Sem Ex	am								
Learning Outcome 2	Explain concept of Virtual Memory and paging.	10	15							
Contents	Basic concept of Virtual Memory. Demand paging Basic concept. Steps of handling a page fault, Pure demand pa	ging.	1							
Method of Assessment	External- End Sem Exam									
Learning Outcome 3	e Develop Program using page replacement 5 10 algorithm									
Contents	Working of Page replacement algorithm.(FIFO	LRU and Optim	nal)							
Method of Assessment	Internal Practical-Lab	Work								

	Describe techniques of file system &								
Course Outcome 5	Security mechanism in OS	Hrs	Marks						
Learning Outcome 1	Explain the concept of file and directory system.	directory 6							
Contents	File concept in OS. File System and its types. File access methods. Directory structure.								
Method of Assessment	External- End Sem Exam	m							
Learning Outcome 2	Identify the security policies and related issues.	6	8						
Contents	Goal of Protection. Domain of Protection. Authentication. Security Issues.								
Method of Assessment	External- End Sem Exam								
Learning Outcome 3	Apply concept of Mobile operating system and check its version.	8	10						
Contents	Various mobile Operating Systems. Timeline of android and version, Download and install Mobile OS.								
Method of Assessment	External Practical								

RC	GPV (E	Diploma Win	g)	S	SCHEME FOI	R		Brai	nch Code		Course C	ode	CO Code	LO Code	
	Ì	Bhopal		EAF	RNING OUTC	OME	E	С	0 4	3	0	2	1	1	Format No. 4
	JRSE ME	OPERATING	SYSTEM				I	I				-		1	1
CO Dese (CO1)	cription	Describe basics	Concept of	Opera	ting System and its	functio	onalit	ty.							
LO Dese (LO1)	cription	Apply the function	ion and obje	ctives	of OS.										
					SCHEME OI	F STUD	ŊҮ								
S. No.	Lear	ming Content	Teaching Learnin Methoo	ng	Description of 7 Process	ſ-L	Tea Hr		/Tut L.Rs.Required Ret						
1	Syst 1.2Syst com		Traditional Lecture me + Handout		Teacher will expla the contents and provide handout to students. Teacher will cond quiz to make stude practice their knowledge.	o uct ents	08				Handout + Videos+ e-content		ntent	NIL	
					SCHEME OF AS	SSESSN	AEN'	Γ							1
S. No.	Metho	od of Assessment	Descri	ption	of Assessment	Maxi Ma	imun ırks	n	-	Resou	irces]	Requi	ired		External / Internal
1	1 Paper 1 Pen/Quiz/Assi		be asked f System,	or the given content student will asked for Basics of Operating System, System components and functions.			2			Question Paper					External- End Sem Exam
		ADI			RUCTIONS FOR T	HE HO	D/ F.	ACU	LTY (I	F AN	Y) (N	IL)			

R	RGPV (Diploma Wing) S	CHEME FOR	Bra	nch Code	Course Code			CO Code	LO Code	
]	Bhopal	LEAR	NING OUTCOM	EC	0 4	3	0	2	1	2	Format No. 4
	URSE ME	OPERATING SY	YSTEM		i			- '	<u>'</u>	•		
CO Des (CO1)	scription	Describe basics C	oncept of Operati	ng System and its functi	onality.							
LO Des (LO2)	cription	List Types of Ope	erating System its	structure and System ca	11.							
				SCHEME OF STU	DY							
S. No.		Learning Content	Teaching – Learning Method	Description of T-L Process	Teacl Hrs.	n Prac /Tu Hrs	t	LRs	Req	uired		Remarks
1	 1.3 Types of Operating System: Batch processing, Multiprogramming, Multitasking, Multiprocessor: symmetric and asymmetric, Time Sharing, Real Time, Network & Distributed OS. 1.4 OS Structure: Monolithic, Microkernel and Layered. 1.5 System Call. 		al al Lecture method	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledg	ge 10			Handout + Videos+e content		NIL	, ,	
	1			SCHEME OF ASSESS	MENT	I						
S. No.	Metho	od of Assessment	Descriptio	n of Assessment	Maxi mum Marks	Resources Required						External / Internal
1	Pen/Q	Paper Juiz/Assignment	asked for type o	ontent student will be of OS its structure and otem call.	10	10 Question						Internal Progressive Test

R	-	Diploma Wing Bhopal	g)		HEME FO ING OUT(F. C	Branch Cod	de 4	C	ourse C	ode	CO Code	LO Code	Format No. 4
	URSE ME	OPERATING S	SYSTE												
	scription	Describe basics	Concep	ot of Operating	g System and it	s function	onality	, •							
LO Description Identify the concept of BIOS Setup and Driver Installation. LO3)															
					SCHEME O	F STUE	DY								
S. No.	Lear	ning Content		eaching – ning Method	Description of Process	Tea ch Hrs.	Prac /Tut H		L	Rs R	equi	red	Remark		
1	gradatio Troubles Window 1.7Devic Installatio	shooting of 's e Driver on, BIOS Setup.		onal Lecture + Handout +	Teacher will explain the cor and provide handout to stud Teacher will co quiz to make so practice their knowledge	lents. onduct		07		Handout + Videos		eos	NIL	,	
				S	CHEME OF A	SSESSN	MENT								
S. No.	Metho	od of Assessment	D	escription of A	Assessment	Maxir Mar			Resources Required						External / Internal
1	Pen/Q	Paper Duiz/Assignment	be gra	he given conte asked for insta dation, Troubl lows Device Dri BIOS Set	allation, Up eshooting of iver Installation,	1()		Lab Manual				External- Practical		

D(Diploma Wi	ng)	C	SCHEME FO	R	Branc	ch Code	Course	Code	CO	LO	
N		Bhopal	ng)		RNING OUT		С		Code Code 3 0 2 2		Code	Format No. 4	
	URSE ME	OPERATING	G SYSTE										
CO Des (CO2)	scription	Describe Com	puter Sys	stem Proces	sses management of	concept an	d apply	concept or	n givei	n probl	em.		
	cription	Identify Proce	ess mana	gement con	icept								
i		·			SCHEME O	F STUDY							
S. No.	Learn	ing Content		ching – 1g Method	Description o Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required		uired Remarks		Remarks	
1	 2.1 Process concept, Process state diagram. 2.2 Process control block. 2.3 CPU Scheduler, Context Switch. 		Traditio Lecture Handou Videos	method +	Teacher will expl contents and prov handout to studen Teacher will cond to make students their knowledge	vide nts. duct quiz	10			Handout + Videos		NII	_
					SCHEME OF A	SSESSME	ENT						
S. No.	Metho	od of Assessment	t D	Description	of Assessment	Maximu Marks		Resou	irces I	Require	ed		External / Internal
1 Paper 1 Pen/Quiz/Assignment		be as	For the given content student will be asked for process state diagram PCB and types of CPC scheduler.				A	ssignr	nent			Internal (Term work	

R	GPV (I	Diploma Wing) SC	HEME FOR	2	Branc	h Coc	le	(Course C	ode	CO Code	LO Code	Л
		Shopal		ING OUTC	OME	C)	4	3	0	2	2	2	Format No. 4
	URSE ME	OPERATING SY	YSTEM								·	-	·	<u>.</u>
(CO2)	scription	Describe Compute	er System Processes	s concept and app	ply concept	on gi	ver	n pro	blen	n.				
LO Des (LO2)	cription	Explain different	CPU Scheduling alg	gorithm.										
				SCHEME OF	STUDY									
S. No.	Lea	rning Content	Teaching – Learning Method				ch s.	Pract . /Tut LRs Required Hrs.			uired		Remarks	
1	Schedul 2.5 Algo SJF, Pri Multiley schedul	orithms- FCFS, ority, RR, vel queue ing, Multilevel ek queue	Traditional Lecture method + Handout + Videos	Teacher will ex contents and pr handout to stud Teacher will co to make student their knowledge	ovide ents. onduct quiz ts practice			10 Handout + Videos			-	NII		
			S	SCHEME OF AS	SESSMENT	Г								
S. No.	Metho	d of Assessment	Description of A	Description of Assessment Maximum Marks Resources Required							External / Internal			
1	Pen/Q	Paper puiz/Assignment	For the given conte be asked for write different CPU s	write algorithm of 10 Lab Manual						Internal Practical- lab work				

R		Diploma Wing Bhopal) SCHEM LEARNING	ME FOF GOUTC		Branch Code	4 3	Course Code CO Code 0 2 3	LO Code	Format No. 4
	URSE ME	OPERATING SY								
CO Des (CO3)	scription	Describe Deadloc	k and disk management.							
	cription	Identify the variou	s conditions of deadlock	Κ.						
			SC	CHEME OF	STUDY					
S. No.	L	earning Content	Teaching – Learning Method	-	tion of T-L ocess	Teach Hrs.	Pract . /Tut Hrs.	LRs Required		Remarks
1	deadloc conditio 3.2 Res graph.	ic Concept of k, Necessary ons for deadlock. ource allocation hod for handling k.	Traditional Lecture method + Handout + Videos	the conter provide h students. Teacher v	andout to vill conduct ake students neir	10		Handout + Videos	+ NIL	
			SCHE	ME OF AS	SESSMENT					
S. No.	Metho	od of Assessment	Description of Assess	sment	Maximum Marks		Resour	ces Required		External / Internal
1	Pen/Q	Paper Duiz/Assignment	Student will be asked necessary condition for c and resource allocation	leadlock	10	Question Paper				Internal Progressive

R(GPV (E	Diploma Win	g) SC	HEME FO	R	Branch	Code	Course C	ode	CO Code	LO Code	1
		Bhopal	-	ING OUT	COME	C 0	4	3 0	2	3	2	Format No. 4
	URSE ME	OPERATING	SYSTEM					I		I		
CO De (CO3)	scription	Describe Deadle	ock and disk manager	nent.								
LO Des (LO2)	cription	To Evaluate the	performance of Bank	ker's algorithm.								
				SCHEME O	F STUDY							
S. No.		ning Content	Teaching – Learning Method	Description Proces		Teach Hrs.	Pract. /Tut Hrs.	LRs	s Requ	ired		Remarks
1	scheme. 3.5 Dead Banker's	lock prevention lock avoidance, Algorithm. lock Detection.	Traditional Lecture method + Handout + Videos	Teacher will ex the contents an provide handou students. Teacher will co quiz to make st practice their k	ut to onduct tudents	05	Handout + Videos				NIL	
			S	SCHEME OF A	SSESSME	NT						
S. No.	Metho	od of Assessment	Description of A	Assessment	Maximu Marks		Reso	urces R	equire	ed		External / Internal
1	Pen/Q	Paper Quiz/Assignment	Student will be Deadlock detectio scheme and Solve n on banker's a	n, Prevention umerical based	10		Question Paper				External- End Sem Exam	
		A	ADDITIONAL INSTR	RUCTIONS FO	R THE HO	DD/ FAC	ULTY (II	F ANY)				

R	GPV (I	Diploma Wing)	SCH	IEME FOR	R	Bra	nch Code Course Code Cod		CO Code	LO Code			
		Bhopal		NG OUTC	OME	С	0 4	3	0	2	3	3	Format No. 4
	URSE ME	OPERATING SYS	STEM										1
CO De (CO3)	scription	Describe Deadlock	and disk managem	ent.									
	cription	List the type of Dis	k scheduling algori	thms and identi	ify RAID	Techno	ology co	ncep	t.				
				SCHEME OF	F STUDY	-							
S. No.	Le	arning Content	Teaching – Learning Method	Description of Process		Teach Hrs.	Prac /Tut H		LR	ls Red	quired		Remarks
1	Latency ⁷ Delay, T Bandwid 3.8 Disk FCFS, S Look, CI 3.9 RAII definitio	Scheduling Algorithm: STF, Scan, C-Scan, Look. D technology on, uses, advantages. mat disk and Create	Traditional Lecture method + Handout + Videos	Teacher will ex the contents an provide handou students. Teacher will co quiz to make st practice their knowledge	ut to		10	10 Handout + Videos		Γ	NIL		
			SC	CHEME OF AS	SESSME	ENT							
S. No.	Metho	od of Assessment	Description of As	ssessment	Maximu Marks		R	esoui	rces R	equir	ed		External / Internal
1	Pen/Q	Paper Quiz/Assignment	Student will be ask scheduling algorith partition	m and disk	10		Lab Manual			External- Practical			

R	GPV (I	Diploma Wing	;)	SCHE	EME FOR		Branch Co	de	Course	Code	CO Code	LO Code	A
		Bhopal		LEARNIN	G OUTCOME	2	C 0	4	3 0	2	4	1	Format No. 4
	URSE ME	OPERATING S	YSTE	EM			I	II		I			I
CO De (CO4)	scription	Explain concept of N	Memor	y Management									
· /	cription	Identify Basics of M	lemory	Management and its	s Schemes.								
				S	SCHEME OF STUD	ΟY							
S. No.	I	Learning Content		Teaching – Learning Method	Description of T Process	[-L	Teac h Hrs.	Prac /Tu Hrs	t LF	Rs Rec	quired		Remarks
1	Overlays and Phys Techniqu Worst Fir Allocatio Memory 4.2 Fragi Table. 4.3 Segm	e between paging and	cal ion y ge	Traditional Lecture method + Videos	Teacher will explai the contents and provide handout to students. Teacher will condu quiz to make studen practice their know	ct nts	15		Vient		econt	NIL	
				SCH	IEME OF ASSESSN	AENT	- -						
S. No.	Metho	od of Assessment		Description of	Assessment		imum arks	R	esourc	es Re	quired		External / Internal
1	Pen/Q	Paper Quiz/Assignment	ao so	tudents will be asked ddress - Logical addr cheme and Fragment aging and segmentat	ation.		15		Quest	ion Pa	aper		External- End Sem Exam

RG	GPV (D	iploma Wing	g)	SCHE <i>N</i>	IE FOR		Branc	h Code	Cou	rse Co	ode	CO Code	LO Code	
	B	hopal	LE	ARNING	OUTCOM	E C	() 4	3	0	2	4	2	Format No. 4
	URSE AME	OPERATING	SYSTEM			I		I			1			
CO Des (CO4)	scription	Describe concept	of Memory Ma	nagement.										
LO Deso (LO2)	cription	Explain concept o	f Virtual Memo	ory and paging.										
				SCI	HEME OF STU	DY								
S. No.		Learning Conte	ent	Teaching –Learning Method	Description Proces			Teach Hrs.	Prac /Tu Hrs	t		LRs quire	d	Remarks
1	4.5 Demai	concept of Virtual M nd paging Basic con- of handling a page fa aging.	cept.	Traditional Lecture method + + Videos	Teacher will exp contents and pro- handout to stude Teacher will con quiz to make stu- practice their kr	ovide ents. nduct idents		10			Hand Vide	dout + os	-	NIL
				SCHEM	ME OF ASSESS	MENT								
S. No.	Method	l of Assessment	Descr	iption of Asse	essment	Maxim Mark			Resou	rces	s Req	uired		External / Internal
	Pen/Qu	Paper uiz/Assignment		be asked for Vin ng, Pure demand e page fault.	2	15			Que	stio	n Paj	per		External- End Sem Exam
		Al	DDITIONAL	INSTRUCTI	ONS FOR THE	HOD/ I	FAC	CULTY	(IF AN	VY)				

RC	GPV (I	Diploma Wing) SC	CHEME FO	R	Branch	Code	Co	urse Co	ode	CO Code	LO Code	
]	Bhopal	LEARN	NING OUT	COME	C 0	4	3	0	2	4	3	Format No. 4
	URSE ME	OPERATING SY	YSTEM			I				<u> </u>		1	1
CO Des (CO4)	scription	Apply concept of Me	emory Management										
LO Des (LO3)	cription	Develop Program us	ing page replacement	algorithm									
				SCHEME C)F STUDY								
S. No.	I	Learning Content	Teaching – Learning Method	Description o	f T-L Process	Tea Hrs	ch	Pract. /Tut Hrs.	F	LRs Requir			Remarks
1		g of Page replacement n.(FIFO LRU and	Traditional Lecture method + Handout + Videos	Teacher will e contents and p handout to stud Teacher will c make students knowledge	rovide dents. onduct quiz to			05		ndout deos	+	NIL	
				SCHEME OF A	SSESSMENT	۲							
S. No.	Metho	od of Assessment	Description of	Assessment	Maximum Marks		R	esourc	es Ro	equire	ed		External / Internal
	Paper Pen/Quiz/AssignmentStudents will be asked to create algorithm, flowchart ,design and run program for Page replacement algorithm(FIFO and LRU)				10			Lab	Mar	nual			Internal Practical-Lab Work
		AD	DITIONAL INST	RUCTIONS FO	R THE HOD	' FACU	JLTY	(IF A	NY)				

RC	GPV (E	Diploma Win	g) SC	HEME FO	R	Bra	nch (Code	C	Course C	ode	CO Code	LO Code	1
]	Bhopal	LEARN	ING OUT	COME	С	0	4	3	0	2	5	1	Format No. 4
	URSE ME	OPERATING	SYSTEM									1	1	1
CO Des (CO5)	scription	Describe technique	es of file system & Secur	ity mechanism in	OS									
	cription	Explain the concept	pt of file and directory sy	stem.										
				SCHEME O	F STUDY									
S. No.	Lear	ning Content	Teaching – Learning Method	Description Proces		Teacl Hrs.		Prac /Tut H		LRs	s Req	uired		Remarks
1	5.2 File Stypes.5.3 File a	concept in OS. System and its access methods. etory structure.	Traditional Lecture method + Handout + Videos	Teacher will ex the contents an provide handou students. Teacher will co quiz to make st practice their k	d at to onduct tudents	06				Han Vide	dout eos	+	NIL	
			S	SCHEME OF A	SSESSME	NT								
S. No.	Metho	od of Assessment	Description of A	Assessment	Maximu Marks			Res	sour	ces R	equir	ed		External / Internal
	Pen/Q	Paper Duiz/Assignment	for File System ess methods and	10			C)ues	tion l	Paper			External- En Sem Exam	
		A	ADDITIONAL INSTR	UCTIONS FO	R THE HO) D/ FA	CU	J LTY (ÎF A	ANY)				

nechanism in OS SCHEME OF STUD Description of T-L Process eacher will explain e contents and ovide handout to udents. eacher will conduct	OY Teach Hrs. 06	Pract. /Tut Hrs.	LRs Handou Videos		NIL	Remarks
SCHEME OF STUD Description of T-L Process eacher will explain e contents and ovide handout to udents. eacher will conduct	Teach Hrs.	/Tut	Handou	ut +	NIL	
SCHEME OF STUD Description of T-L Process eacher will explain e contents and ovide handout to idents. eacher will conduct	Teach Hrs.	/Tut	Handou	ut +	NIL	
Description of T-L Process eacher will explain e contents and ovide handout to idents. eacher will conduct	Teach Hrs.	/Tut	Handou	ut +	NIL	
Process eacher will explain e contents and ovide handout to idents. eacher will conduct	Hrs.	/Tut	Handou	ut +	NIL	
e contents and ovide handout to idents. eacher will conduct	06				NIL	_
iz to make students actice their owledge						
IEME OF ASSESSN	IENT					
ssment		Res	sources R	lequired		External / Internal
		(Question 1	Paper		External- End Sem Exam
TIONS FOR THE I	HOD/ FA	CULTY ((IF ANY)			
	iowledge IEME OF ASSESSM essment Maxim Mar ked for ation and 08	IEME OF ASSESSMENT essment Maximum Marks ked for ation and 08	iowledge IEME OF ASSESSMENT essment Maximum Marks ked for ation and 08	Maximum Resources R essment Maximum Marks Resources R ked for 08	Maximum Marks Resources Required ked for Image: Constraint of the second secon	Iewiedge Iewie of ASSESSMENT essment Maximum Marks ked for ation and 08 Question Paper

		iploma Wing	;)	SCHE	ME FOR	Branch Cod	e (Course Code	CO Code	LO Code	
	B	hopal	I	EARNIN	G OUTCOME	<i>C 0</i>	4 3	0	2 5	3	Format No. 4
COU NAN		OPERATING S	YSTEM				I		I	1	1
CO Descripti (CO5)		Describe techniques	of file syst	em & Security r	nechanism in OS.						
LO Desc (LO3)	cription	Apply concept of M	obile opera	ting system and	check its version.						
				S	CHEME OF STUDY						
S. No.		Learning Content		Teaching – Learning Method	Description of T-	L Process	Teac h Hrs.	Pract . /Tut Hrs.	LR Requi		Remarks
	5.10 Time	as mobile Operating Pline of android and v nload and install Mo	version,	Traditional Lecture method + Handout + Videos	Teacher will explain contents and provide students. Teacher will conduct make students practic knowledge	handout to quiz to		08	Hando Videos		NIL
				SCH	EME OF ASSESSME	ENT					
S. No.	Method	l of Assessment	Γ	Description of .	Assessment	Maximum Marks	Res	sources	Require	d	External / Internal
	Pen/Qu	Paper 11z/Assignment	1. To exp Operating	will be asked dain basic conc g System. all mobile Oper	•	10	Lab Ma	anual			External Practical
		AD	DITIONA	L INSTRUC	FIONS FOR THE H	DD/ FACUL	LTY (IF	ANY)			

Computer Science and Engineering

Operating System (302)-(OCBC)

S.No.	List of Experiment	CO
1	Installation and upgradation of Windows Operating system	CO1-LO3
2	Troubleshooting Windows Operating system (For 5 or more problems) –OS failure/corrupt, BSOD, DLL files, etc.	CO1-LO3
3	Execute Operating system performance boosting/improvement steps.	CO1-LO3
4	Device Management, driver installation and upgradation.	CO1-LO3
5	BIOS management.	CO1-LO3
6	Write algorithm for FCFS , cpu scheduling.	CO2-LO2
7	Write algorithm for SJF cpu scheduling.	CO2-LO2
8	Write algorithm for round-robin cpu scheduling.	CO2-LO2
9	Disk Management – Observe disk usage, create partition, recover and format a disk drive.	CO3-lo3
10	Registry cleaning, diagnosis and debugging.	CO3-lo3
11	Write programs for LRU page replacement	CO4-lo3
12	Write programs for Optimal page replacement	CO4-lo3
13	Installation and Configuration of Mobile Operating System .	CO5-lo3

		IPLON SHOPA			RRICULUM E COURSE	FORMA	2	Sheet No. 1/3
Branch	Con	nputer Sc	ience an	d Engineering/Info	rmation Technology	Semester		3 rd
Course (Code			Course Name	Pytho	n Programn	ning	
Course	Outco	ome 1	Interp	oret basic construc	ets of python program	nming	Teach Hrs	Marks
Learning	g Outo	come 1		ibe steps to setup j onment, features a	python development nd modules.		8	5
Co	ontent	5	of inst Enviro concep concep pythor built-i	alling/setting pytho onment (IDLE), cre of of modules in py of of PYTHONPAT n package-managem n/global/local name	of python, Basic struct on, Integrated Develop ating, editing, running thon, from/import state TH and sys.path variab nent system (pip), Nan espace, datetime modu	ment and Lea python prog ement, Modu les, Renamin nespaces and	arning ram wit le Sear g/alias	th IDE, ch Path, a module,
Method o	of Asse	ssment	Lab A	ssessment(File)				
Learnin	g Outo	come 2	-	in different data ty d functions in Pyt	ypes, operators, and t hon.	user	12	10
Co	ontent	S	conver Arithn	rsion. Concept of ir netic operators, Ass ors, Bitwise operato	bles, global variables. put output. Unary, bin signment operators, Re ors. Single line and mu	ary and terna lational oper	ary oper ators, L	rators. Logical
Method o	of Asse	ssment	Quiz					
Learnin	g Outo	come 3	Write	programs using b	pasic constructs.		12	10
Co	ontent	S	Iterativ	0	tatements (if-else-else while) and their flow c e math module.	,		
Method o	of Asse	ssment	Lab A	ssessment(File)				
Course	Outco	ome 2	Devel handl		g structure types and	exception	Teach Hrs	n Marks
Learnin	g Outo	come 1	Use b	uilt in functions to	manipulate strings a	nd lists.	10	10
Co	ontent	S	value. Join tv	Iterating over list, over list, over lists, sort, and re	st, access list items, ad check if item exists in everse a list. Working v cing, string length, esc	list, length of with strings, i	f list, co multilin	opy list. e strings.

	operation in string, convert object to string using str().		
Method of Assessment	Programming		
Learning Outcome 2	Write programs using tuples, dictionaries and sets.	7	5
Contents	Create tuple, indexing in tuple, access items of tuple. Conver Iterating over tuple, check if an item exists in tuple. Tuple le tuples. Create set, access items of set, add items to set, length an item in set, join two sets, and update set. Union operation dictionary, keys-value pair in dictionary. Add, remove and a dictionary. Change item value. Iteration over dictionary, Che length of dictionary, copy dictionary.	ngth, joi 1 of set. 1 of set. C ccess ite	n two Remove Create ms of the
Method of Assessment	Lab Assessment(File)		
Learning Outcome 3	Use exception handling, numpy module to manipulate arrays.	11	10
Contents	Need for Exception Handling. Try, except and finally statem class, Catching Specific Exceptions Raising exceptions. Try numpy module - create arrays, indexing in array, accessing a arrays, modify and copy array. Create view of array. Iterating two arrays, split arrays, using searchsorted and sort method.	with else rrays, sli	e clause. icing
Method of Assessment	Quiz		
Course Outcome 3	Apply the concepts of classes, file handling and GUI designing.	Teach Hrs	Marks
Learning Outcome 1	Write programs using classes, objects, constructors and access class members.	13	15
Contents	Basic syntax and structure of a Class. Declare/define Variable a class. Class or Static Variables in class. Creating objects ar members using dot(.) operator. Constructors in class, default parameterized constructor, self keyword, destructors in pythe	nd access construc	s class
Method of Assessment	Programming		
Learning Outcome 2	Develop GUI using tkinter interface.	10	10
Contents	Basics of tkinter module. Creating main window, configure p window such as -title, size. Tk(), mainloop() methods. Addir Button, Label, Entry, Text, Canvas, Frames. Arranging widg geometry manager classes. Drawing shapes such as - lines, o on canvas.	ng basic tets using	widgets - g
Method of Assessment	Lab Assessment(File)		

Learning Outcome 3	Use built in library to perform file/directory related operations.	12	15				
Contents	Perform basic file/directories related operations such as - create, copy, move, or rename. reading and writing file contents. Basic concept of Logging.						
Method of Assessment	Programming						

RG	GPV (Diplo	ma Wing	g)	SCH	IEME FOR		Branch C	Code	Course Co	de	CO Code	LO Code	Format No. 4
	Bhop	_		EARNI	NG OUTCO	ME	<i>C</i> 0	4	3 0	3	1	1	I officiat 140.
COU	RSE NAME	Python Pro	gramming			I		· · · · · ·	I		1	I	
CO Desc	cription (CO1)	Interpret ba	asic constru	cts of pytho	n programming.								
LO Desc	cription (LO1)	Describe ste	eps to setup	python dev	elopment environm	ent, featu	ires and n	nodules.					
					SCHEME OF ST	UDY							
S. No.		Learning C		Teaching – Learning Method		ption of Process	Teach Hrs.	Pra /Tut l			LRs equired	Remarks	
1	Features and,applications of python, Basic structure of python program, steps of installing/setting python, Integrated Development and Learning Environment (IDLE), creating, editing, running python program with IDE, concept of modules in python, from/import statement, Module Search Path, concept of PYTHONPATH and sys.path variables, Renaming/alias a module, python package-management system (pip), Namespaces and Scope in Python, built-in/global/local namespace, datetime module.				Lab practicals with traditional lecture method and handouts	Teacher explain contenta provide handout	the s and	04	04	-		ndout + eos+ e- tent	NIL
				SC	CHEME OF ASSE	SSMEN	Т						
S. No.	Method of A	ssessment		Descriptio	on of Assessment			ximum larks	Resou	ources Required			External / Internal
1	Lab Assess	ment(File)	Students w	ill be asked	to write questions in	lab files.	questions in lab files. 5			Question Paper			Internal

RG	GPV (Diplo	ma Wing) SCI	HEME FOR		Branch	Code	Course	Code	CO Code	LO Code	Format No.
	Bhop	al	LEARN	ING OUTC	OME	<i>C</i> 0	4	3 0	3	1	2	I officiat 140.
COU	RSE NAME	Python Prog	ramming									
CO Desc	cription (CO1)	Interpret ba	sic constructs of pythe	on programming.								
LO Desc	cription (LO2)	Explain diffe	erent data types, opera	ators, and user de	fined functi	ons in Py	thon.					
				SCHEME OF	STUDY							
S. No.		Learning Co	ontent	Teaching – Learning Method	Descrip T-L Pi		Teach Hrs.		act. t Hrs.	Re	LRs equired	Remarks
1	Keywords,creat Various data ty input output. U Arithmetic oper Relational oper operators. Sing defined function	pes, type conve nary, binary and rators, Assignm ators, Logical o le line and mult	Traditional lecture method and handouts	Teacher v explain th contents a provide h	and	12		00	Vic	ndout + leos+ e- ntent	NIL	
			S	CHEME OF ASS	SESSMEN'	Γ						I
S. No.	Method of A	ssessment	Descript	scription of Assessment			ximum Iarks	Reso	Resources Required			External / Internal
1	Qu	iz	Quiz Multiple choice questions			10			uestic	on Par	ber	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RG	RGPV (Diploma Wing)			SCHEME F	OR	Branch (Code	Cou	ırse Co	de	CO Code	LO Code	Format No. 4
	Bhop	al	L	LEARNING OUTCOME			4	3	0	3	1	3	
COU	RSE NAME	Python Prog	gramming			· · · · · ·							
CO Desc	cription (CO1)	Interpret ba	sic construct	ts of python programm	ing.								
LO Desc	cription (LO3)	Write progr	ams using ba	asic constructs.									
				SCHEME	OF STUDY								
S. No.	Learning Content			Teaching – Learning Method	Description Proce		Teach Hrs.		Pra Tut 1		R	LRs equired	Remarks
1	Working on co else-elseif) and statements (for chart. Loop cor continue, pass.	their flow char , while) and the atrol statements	t. Iterative ir flow - break,	Lab practicals with traditional lecture method and handouts	Teacher will e contents and p handouts. Stue program it in t	brovide dents will	4		30	}	Vic	ndout + leos+ e- ntent	NIL
				SCHEME OF	ASSESSMEN	NT	1						
S. No.	Method of A	ssessment		Description of Assess		Maximum Marks		lesou	ources Required		uired	External / Internal	
1	Lab Assess	ment(File)	Students will and prepare	l be asked to write prog lab files.	rams in the lab		10		Qu	estio	on Pap	per	Internal

RG	RGPV (Diploma Wing))	SCHEME F	OR	Branch C	Code	Course	Code	CO Code	LO Code	Format No.
	Bhop	0	·	LEARNING OUTCOME			4	3	0 3	2	1	I officiat 140.
COU	RSE NAME	Python Prog	gramming		· · ·		· · · · ·					
CO Desc	cription (CO2)	Develop pro	grams using	structure types and ex	ception handlin	g.						
LO Desc	ription (LO1)	Use built in f	unctions to m	anipulate strings and lis	its.							
				SCHEME	OF STUDY							
S. No.	Lea	rning Conten	nt	Teaching – Learning Method	Description Proces		Teach Hrs.		ract. 1t Hrs	. R	LRs equired	Remarks
1	Create list, indexing in list, access list items, add, remove and modify item value. Iterating over list, check if item exists in list, length of list, copy list. Join two lists, sort, and reverse a list. Working with strings, multiline strings. String indexing, string slicing, string length, escape character, search and split operation in string, convert object to string using str().			Lab practicals with traditional lecture in method and ists, handouts s. blit					7	Vie	ndout + deos+ e- ntent	NIL
				SCHEME OF	ASSESSMEN	Т						
S. No.	Method of A	ssessment]	Description of Assess		Maximum Marks			es Req	uired	External / Internal	
1	Program	mina	Students will	idents will be asked to write code for a given task.				6)nesti	on Pa	External	

RG	GPV (Diplo	ma Wing)	SCHEME F	OR	Branch (Code	Course Cod		O LO ode Code	Format No. 4	
	Bhop	al	LE	LEARNING OUTCOME		<i>C</i> 0	4	3 0	3	2 2		
COU	RSE NAME	Python Prog	gramming		· · · ·		· · · ·			· · ·		
CO Desc	cription (CO2)	Develop pro	ograms using	structure types and ex	ception handlin	ıg.						
LO Desc	cription (LO2)	Write progr	rams using tu	ples, dictionaries and s	sets.							
				SCHEME	OF STUDY							
S. No.	Lea	rning Conte	nt	Teaching – Learning Method	Description Proces		Teach Hrs.	Prac /Tut H		LRs Required	Remarks	
1	items of tuple. O Iterating over tu in tuple. Tuple Create set, acce set, length of set join two sets, an operation of set value pair in dia access items of item value. Iter	, indexing in tuple, access le. Converting tuple to list. er tuple, check if an item exists ple length, join two tuples. access items of set, add items to f set. Remove an item in set, s, and update set. Union set. Create dictionary, keys- a dictionary. Add, remove and s of the dictionary. Change Iteration over dictionary, y exists, length of dictionary,		Lab practicals with traditional lecture method and handouts	Teacher will ex- contents and pr handouts. Stud program it in th	rovide lents will he lab	ain the 2 ide s will			Handout + Videos+ e- content	NIL	
	1			SCHEME OF	ASSESSMEN	T						
S. No.	Method of A	ssessment]	Description of Assessment			ximum Iarks	Resou	Resources Required		External / Internal	
1	Lab Assess	Lab Assessment(File)Students will be asked to write programs in the la and prepare lab files.			rams in the lab	5		Question Paper			Internal	

RC	GPV (Diplo	ma Wing)	SCHEME F	OR	Branch (Code	Сот	ırse Co	de	CO Code	LO Code	Format No. 4
	Bhop	al		EARNING OU	ГСОМЕ	<i>C</i> 0	4	3	0	3	2	3	1 0111at 1 (0. •
COU	RSE NAME	Python Prog	gramming										
CO Dese	cription (CO2)	Develop pro	grams using	structure types and ex	ception handling	ng.							
LO Desc	cription (LO3)	Use exception	on handling, r	numpy module to man	ipulate arrays.								
				SCHEME	OF STUDY								
S. No.	Lea	rning Conte	nt	Teaching – Learning Method	Description Proce		Teach Hrs.		Pra Tut l		Re	LRs equired	Remarks
1	No.Learning ContentNeed for Exception Handling. Try, except and finally statement. Exception class, Catching Specific Exceptions Raising exceptions. Try with else clause. numpy module - create arrays, indexing in array, accessing arrays, slicing arrays, modify and copy array. Create view of array. Iterating over array, join two arrays, split arrays, using searchsorted and sort method.			Lab practicals with traditional lecture method and handouts	Teacher will e contents and p handouts. Stud program it in t	4		7		Vid	ndout + leos+ e- itent	NIL	
				SCHEME OF	ASSESSMEN	NT							
S. No.	Method of A	ssessment]	Description of Assess	sment		ximum larks	Resources			s Requ	uired	External / Internal
1	Qu	iz	Multiple cho	ice questions			10		Qu	estio	on Pap	ber	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)	

RG	RGPV (Diploma Wing))	SCHEME F	SCHEME FOR		Code	Cou	Course Code		CO Code	LO Code	Format No. 4
	Bhop	al		LEARNING OUTCOME			4	3	3 0 3		3	1	
COU	RSE NAME	Python Prog	gramming										
CO Desc	cription (CO3)	Apply the co	ncepts of classes, file handling and GUI designing.										
LO Desc	cription (LO1)	Write program	ms using class	ses, objects, constructor	s and access class	s member	s.						
				SCHEME	OF STUDY								
S. No.	Lea	rning Conten	nt	Teaching – Learning Method	Description Proces		Teach Hrs.		Pra Tut I			LRs equired	Remarks
1	Basic syntax an Declare/define class. Class or S Creating object using dot(.) ope default construct constructor, self python.	Variables and r Static Variables s and access cla erator. Construc ctor, parameteri	nethods in a s in class. ass members tors in class, ized	Lab practicals with traditional lecture method and handouts	Teacher will ex contents and pr handouts. Stude program it in th	ovide ents will	6		7		Vid	ndout + leos+ e- itent	NIL
	1			SCHEME OF	ASSESSMEN'	Г	1				I		
S. No.	Method of A	ssessment]	Description of Assess	sment		Maximum Marks			ources Required			External / Internal
1	Progran	nming	Students will be asked to write code for a given task.				15			estio	n Par	ber	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)	

RG	RGPV (Diploma Wing))	SCHEME F	OR	Branch (Code	Course	e Code	CO Code	LO Code	Format No. 4
	Bhop	al	LE	LEARNING OUTCOME			4	3	0 3	3	2	
COU	RSE NAME	Python Prog	gramming								· · ·	
CO Desc	cription (CO3)	Apply the co	oncepts of cla	sses, file handling and	GUI designing	•						
LO Desc	cription (LO2)	Develop GU	I using tkinte	er interface.								
				SCHEME	OF STUDY							
S. No.	Lea	rning Conte	nt	Teaching – Learning Method	Description Proce		Teach Hrs.		ract. ut Hrs	. R	LRs equired	Remarks
1	Basics of tkinter module. Creating main window, configure properties of main window such as -title, size. Tk(), mainloop() methods. Adding basic widgets - Button, Label, Entry, Text, Canvas, Frames. Arranging widgets using geometry manager classes. Drawing shapes such as - lines, oval, rectangle etc on canvas			Lab practicals with traditional lecture method and handouts	Teacher will e contents and p handouts. Stuc program it in t	rovide lents will	3		7	Vio	ndout + leos+ e- ntent	NIL
				SCHEME OF	ASSESSMEN	T						
S. No.	Method of A	ssessment]	Description of Assess	sment		ximum larks	Re	source	s Req	uired	External / Internal
1	1 Lab Assessment(File) Students will and prepare			ll be asked to write programs in the lab lab files.			10		Questio		per	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)									

RGPV (Diploma Wing Bhopal) SCHEME FOR		Branch Code		Course Code	CO Code	LO Code	Format No. 4			
					<i>C</i> 0	4	3 0 3	3	3			
COU	RSE NAME	Python Prog	gramming									
CO Desc	cription (CO3)	Apply the co	concepts of classes, file handling and GUI designing.									
LO Description (LO3) Use built in			in library to perform file/directory related operations.									
				SCHEME	OF STUDY							
S. No.	Lea	Learning Content		Teaching – Learning Method	▲	Description of T-L Process		Pract. /Tut Hrs	. R	LRs Required Rema		
1	Perform basic file/directories related operations such as - create, copy, move, or rename. Reading and writing file contents. Basic concept of Logging.			Lab practicals with traditional lecture method and handouts	Teacher will ex contents and pr handouts. Stud program it in th	ovide ents will	4	8			NIL	
				SCHEME OF	ASSESSMEN	T						
S. No.	Method of A	Assessment		Description of Assess	sment	Maximum Marks		Resources Required		uired	External / Internal	
1	Program	nming	Students will be asked to write code for a given task.				15	Question Paper			External	

•			
SNo	Suggested List of Experiments	со	LO
1	Setting up environment/ IDE to create, edit and run Python Programs	CO1	LO1
2	Program to OutPut "Hello World".	CO1	LO1
3	Program to read input from keyboard of various data types and print them.	CO1	LO2
4	Programs to perform data manipulation using various operators in python.	CO1	LO2
5	Program to demonstrate, type casting, global variables, comments and user defined functions, errors due to indentation.	CO1	LO2
6	Programs to implement conditional and looping statements.	CO1	LO3
7	Programs to perform various operations on lists and strings.	CO2	LO1
9	Programs to perform various operations on dictionaries, tuples, sets.	CO2	LO2
10	Programs to raise exception and perform exception handling	CO2	LO3
11	Programs to manipulate arrays using numpy module.	CO2	LO3
12	Programs to create a simple class, add variables and methods, constructors and create objects.	CO3	LO1
13	Programs to create a basic window GUI using tkinter interface.	CO3	LO2
14	Programs to add various widgets such as - buttons, labels, entry, canva, etc.	CO3	LO2
15	Programs to perform operations such as create, delete, modify, read, write to files.	CO3	LO3

RGPV ((DIPLOMA W BHOPAL	/ING) OB		ICULUM FOR	FORMAT-3		Sheet No. 1/3					
Branch		ALL B	RANCHES		Semester		III					
Course (Code	Cours	se Name		PROFESSIONAL DEVELOPN	/IENT-III						
Course	e Outcome 1	Student will problem in t		Teach Hrs	Marks							
Learnin	g Outcome 1	Student will be able to demonstrate his/her understanding of leadership required in a team 10 10 work performance 10 10										
Co	ontents	Team leaders team leaders	•	e of team leader, role	e of team leaders, important qualities of good	team leaders,	behaviors of good					
Method	of Assessment	Paper pen te	st									
Learnin	g Outcome 2	Student will I given situation		ay role of the leader of	of a team for solving a team problem in the	10	15					
Co	ontents	Team leaders team leaders	•	e of team leader, role	e of team leaders, important qualities of good	team leaders,	behaviors of good					
Method	of Assessment	Student's role	e play									
Course	e Outcome 2	Student will be able to apply professional ethics in a given problem situation										
Learnin	g Outcome 1	Student will be able to demonstrate his/her understanding of professional ethics1010										
Co	ontents	engineers, e	thical issue	•	e, seven ethics common to all profession nmon problems related to professional et	•						

Method of Assessment	Paper pen test		
Learning Outcome2	Student will be able to apply appropriate professional ethics in a given problem situation	10	10
Contents	Procedure of solving the problems related professional ethics, Identification of ethic ethical stand, searching various possible solutions for the problem keeping ethical st appropriate solution.		
Method of Assessment	Paper pen test		
Course Outcome 3	Student will be able to plan self-learning to complete the given task	Teach Hrs	Marks
Learning Outcome 1	Student will be able to identify the self-learning needs for completing the given task	10	10
Contents	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelo needs	ong learning, idei	ntification of learning
Method of Assessment	Assessment through student activity		
Learning Outcome 2	Student will be able to plan self directed learning for completing the given task	10	10
Contents	Need for planning, need for planning self directed learning, planning self directed learning,	self directed lea	rning plan, examples.
Method of Assessment	Assessment through student activity		

				SCHEM	E FOR LEARNI	NG	Branch	Code	Co	ourse Coo	de	CO Code	LO Code	
KGPV		oma Wing) Bh	opai	(DUTCOME		M) 2	3	0	5	1	1	Format No. 4
COURS	SE NAME	Professional Deve	lopment	-111					1					
CO Des	cription	Student will be able	e to perfo	orm as the tea	m leader of small te	am for s	olving a t	team pro	oblem	ı in th	e give	n situ	ation	
LO Des	cription	Student will be abl	le to dem	onstrate his/h	er understanding of	f leaders	hip requi	red in a	team	n work	k perf	ormai	nce	
		1			SCHEME OF ST	rudy								
S. No.	Lear	rning Content		g-Learning ethod	Description of Process	T-L	Teach Hrs.	Prac /Tut H		LR	s Req	uired		Remarks
1.	of team l team lea qualities	behaviors of good		onal lecture + Case Study	Teacher will explain the contents along- examples/cases, wi assignment for prac will conduct tutoria remedial.	with II give :tice,	05	05		Har	ndout, film			*Teacher will suggest a suitable online video to be viewed by students
		·			SCHEME OF ASSE	SSMEN	Γ	1					I	
S. No.	Metho	d of Assessment	De	escription of <i>I</i>	Assessment	Maxir Mai	-	R	lesou	irces F	Requi	red		External / Internal
1	Pa		by the tea	acher to assess	and administered the understanding ent will be done ng Scale.	10	0	Test	: pape	er and	Ratinę	g Scale	2	Internal
			ADE	DITIONAL INS	TRUCTIONS FOR TH	HE HOD	/ FACULT	y (if an	IY)					
will be a	able to 1. to take 2. take re 3. to visua	es of team leader:- initiatives sponsibility on behalf alize the team event a interest to carry out r	ind plan t	hings for the e	event									

5. to take interest in solving team related problems

The test questions :-

- 1. Explain the importance of team leadership
- 2. Explain important qualities of good team-leaders
- 3. Identify the team leader's behavior in the following list of team persons' behavior
- 4. Identify the team leader in the following case of team event
- 5. Suggest the team leader's would be course of action in the following team problem situation

Performance indicators

- 1. Quality of response the Q. 1
- 2. Quality of response to Q. 2
- 3. Number of correct behaviors identified in Q. 3(Max. 3 correct behaviors out of 10)
- 4. Correct team leader identified or not, in Q. 4
- 5. Correct team leader course of action suggested or not, in Q. 5

			Dhanal	SC	HEME FOR LEARNING	Branch Code	e	Co	ourse Code		CO Code	LO Code	
RGP		oma Wing)	впораг		OUTCOME	MO	2	3	0	5	1	2	Format No. 4
COURS	SE NAME	Professional	Development	-111		II	I						
CO Des	scription	Student will b	e able to perfo	orm as	s the leader of small team for solving	g a team pro	blem i	n th	e given	situ	ation		
LO Des	cription	Student will b	e able to play	role o	f the leader of a team for solving a	team problei	m in th	e gi	ven situ	ıatio	n		
					SCHEME OF STUDY								
S. No.	Learnin	ng Content	Teaching- Learning Met		Description of T-L Proce	SS	Teac Hrs		Pract /Tut H	-	LF Requ		Remarks
1	leader, ro leaders, ir qualities c	ce of team le of team mportant of good team wehaviors of	Case Study met	thod	Teacher will organize a students' tea class/ department. Few students will to play roles of team members and t solve team problems under given site Other students will observe. Afterwa will discussion with students. Teacher organize similar events for practice.	be asked he leader to uation. Ird, teacher	02		08		vid filr		*Teacher will suggest a suitable online video to be viewed by students
					SCHEME OF ASSESSMENT	ſ					1		
S. No.	Method	of Assessmen	t		Description of Assessment				aximur Marks	n		urces uired	External / Internal
1	Stude	ent's role play	individual problem,	stude , unde	will organize small team events in bat ents will be asked to play role of leade or given situation. Teacher will observe ler's behavior performed by students performance indicators	r to solve a te e and assess t	eam the		15			ting ale	Internal
			ADD	DITIO	NAL INSTRUCTIONS FOR THE HOD/	' FACULTY (I	F ANY)					I
	1. Extent	to which studer	t take initiative	ès S	formance indicators:-								
	3. Extent	to which studer	t visualize the t	team	on behalf of group event and plan things for the event ryout team related activities								

				SCHEME FO	R LEAR	NING	Branch Cod	le	Cou	urse Co	de	CO Code		LO Code	
KG		oma Wing) Bhor	Dai	OUT	COME				3	0	5	2		1	Format No. 4
COU	JRSE NAME	Professional Develop	omen	t-III				L I			1	1			
CO D	Description	Student will be able	to ap	oply professional et	hics in a g	given problen	n situatio	n							
LO D	Description	Student will be able t	le to demonstrate his/her understanding of professional ethics												
		1		S	CHEME O	F STUDY									
S. No.	I	earning Content		Teaching – Learning Method		ption of T-L rocess	Teach Hrs.	Pract /Tut Hrs.		LF	Rs Re	quire	ed		Remarks
1	Professional ethics, its need a importance, seven ethics comm all professionals, general code ethics for engineers, ethical iss for engineers, common proble related to professional ethics, et issues, identification of ethical is in cases for engineers.		on to of ues ms hical	Traditional lecture method + Case Study	r will explain the contents ong-with es/cases, will signment for , will conduct orials and medial.	05	05		Handout, video film*					*Teacher will suggest a suitable online video to be viewed by students	
				SCHI	EME OF A	SSESSMENT									
S. No	o. Metho	od of Assessment	De	scription of Assessr	nent	Maximum Marks		Reso	urce	es Re	equir	ed			External / Internal
1	1 Paper pen test			est will be designed inistered by the tead ess the understandi nt. Assessment will I through Rating Scal	cher to ng of pe done	10	T	Test paper and Rating Scale					le		Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. Ethics common to all professions

- honesty
- trustworthiness
- loyalty
- respect for others
- adherence to the law
- doing good and avoiding harm to others
- Accountability.

2. General code of ethics for engineers:-

- 1. Respect for People's Dignity and Rights
- 2. Responsible Practice
- 3. Integrity in Relationships
- 4. Responsibility

3. Common Ethical issues for engineers:-

- Relationships with clients, consultants, competitors, and contractors
- Ensuring legal compliance by clients, client's contractors, and others
- Conflict of interest
- Bribery and kickbacks, which might include:
 - Gifts, meals, services, entertainment and recreation opportunities
- Treatment of confidential or proprietary information

- Consideration of the employer's assets
- Outside employment/activities

Test Performance Indicators:-

Extent to which student will be able

- 1. To explain the professional ethics (2 marks)
- 2. To explain the need and importance of professional ethics (2 marks)
- 3. To explain seven ethics common to all professions (2 marks)
- 4. To identify the problem related to professional ethics in given list of problems (2 marks)
- 5. To identify the ethical issue for an engineer in a given case of professional ethics (2 marks)

			1	SCHEME FO	R LEAR	NING	Branch Coc	le (Course C	ode	CO Code	LO Code	
KGI	PV (DIPIC	oma Wing) Bhop	ISC	OUT			3	0	5	2	2	Format No. 4	
COU	IRSE NAME	Professional Develop	oment	t-111		I	I	11			1		
CO D	Description	Student will be able	to ap	ply professional et	hics in a g	given problen	n situatio	n					
LO D	escription	Student will be able t	to app	ly appropriate profe	essional et	hics in a given	n problem	n situation	l				
				S	CHEME O	F STUDY							
S. No.	L	earning Content		Teaching – Learning Method		ption of T-L rocess	Teach Hrs.	Pract. /Tut Hrs.	L	Rs Re	quire	d	Remarks
1	Procedure of solving the problems related professional ethics, Identification of ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of appropriate solution.		d,	Traditional lecture method + Case Study	about th along-wi example give assi	s/cases, will gnment for will conduct and	05	05	Ha filn		:, vide	0	*Teacher will suggest a suitable online video to be viewed by students
				SCHI	EME OF A	SSESSMENT							
S. No	o. Metho	od of Assessment	Des	scription of Assessr	nent	Maximum Marks		Resour	ces R	equir	ed		External / Internal
1	Pa	aper pen test t	ethica be des he tea stuc proble	e based test on prob al issue for an engine signed and administ acher to assess the a dents to solve the ef m; Assessment will through Rating Scal	eer will ered by ability of thical be done	10	Т	est paper	and	Ratin	g Scale	Ģ	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Steps in solving ethical problems:-

- 1. Identify the ethical issue in the problem
- 2. Identify the ethical stand in the problem
- 3. Search for various possible solutions keeping focus on the ethical stand
- 4. Implement the best possible solution

Performance indicators:-

- 1. Correctness of identified ethical issue in the problem (3 marks)
- 2. Correctness of identified ethical stand (3 marks)
- 3. Quality of suggested possible solutions (2 marks)
- 4. Appropriateness of selected best possible solution (2 marks)

ma Wing) Bho Professional Develo	•	OUTCOME		MO) 2	3	n	5	2	1	Format No. 4
		OUTCOME				3	0 5 3 1				
	opment-III			·	!			· · ·			· ·
Student will be abl	e to plan self-learni	ing to complete the	given ta	ask							
Student will be ab	le to identify the se	lf-learning needs fo	or comp	leting th	e given	task					
		SCHEME OF ST	rudy								
ning Content	Teaching-Learning Method	Description of Process	T-L	Teach Hrs.		-	LR	s Requ	uired		Remarks
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Examples:-

1. We learn to use smart phones (informal learning)

2. We learn yoga by joining a one week yoga training programme organized by a private spiritual institute (formal learning).

2. Self directed learning

A process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.

3. Essential steps of lifelong learning

- 1. Identification of self learning need (what to learn)
- 2. Searching about how I can learn, search of learning resources and ways/means to use them for learning
- 3. Planning self-learning
- 4. Implementing the plan

4. Suggested list of tasks for practice of identification of learning needs

- 1. You have to repair your faulty house-hold electric iron
- 2. You have to daily operate the new washing machine purchased at your home
- 3. You have to format your PC
- 4. You have to attend online class using meet.google app
- 5. You have to share your ideas online with your distant friends. You have to arrange a webinar
- 6. You have to visit abroad and therefore you have to apply for passport
- 7. Your mother is a patient of high BP. You have to measure her BP daily two times at home with traditional BP measuring apparatus
- 8. Your bike is not getting started. You have to check its spark plug.
- 9. You have to complete bank paper formalities for bank loan to establish your small manufacturing unit
- 10. You have to prepare French-fries at home.

5. Self-assessment portfolio

A questionnaire in which questions are in first person and space is provided after each question to write the answer. It is prepared by the student.

6. Self-assessment portfolio questions:-

- 1. Can I complete this task ?
- 2. Is there special knowledge or skill required to complete the task ?

- 3. What knowledge or skill is required to complete this task ?
- 4. Do I have this knowledge or skill?
- 5. From where I can learn this knowledge or skill. (Mention at least three sources. Sources may be people, institutions, books, websites?)
- 6. How I can manage to learn this knowledge or skill?

7. Indicators of performance

- 1. Able to identified that he/she can-not complete the given task due to lack of knowledge or skill
- 2. Able to identified the need for special knowledge or skill to complete the task
- 3. Correctness of identified knowledge or skill required to complete the task
- 4. Appropriateness of sources from which student can learn knowledge or skill
- 5. Extent of feasibility of student's way to acquire the required knowledge or skill

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5. Identification of self learning need (what to learn)

- 6. Searching about how I can learn, search of learning resources and ways/means to use them for learning
- 7. Planning self directed learning
- 8. Implementing the plan

4. Contents of the plan

- 1. Description of knowledge or skill to be self-learned
- 2. Description of selected source of learning the knowledge or skill ie people, books, institutions, websites etc.
- 3. Description of method of self-directed learning viz formal learning or informal learning
- 4. Description of additional resources / learning resources required
- 5. Expected time required to learn along with justification

5. Indicators of performance

- 1. Quality of description of knowledge or skill to be self-learned (3 marks)
- 2. Appropriateness of selected source of knowledge or skill learning (3 marks)
- 3. Appropriateness of method of self-learning (1 mark)
- 4. Appropriateness of additional resources / learning resources required (1 mark)
- **5.** Appropriateness of time required to learn (1 mark)