RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/3

Branch	Computer Science and Engineering/Information Technology	Semester	Third

Course Code	C04	Course Name	COMPUTER ARCHITECTURE

		Teach Hrs	Marks
Course Outcome 1	**Interpret various type of micro-operations and instructions.**	30	38 (10+28)
Learning Outcome 1	Understand Register transfer language and micro-operations.	10	14
Contents	• 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 its Hardware implementation. • Shift (logical, circular, arithmetic)		
Learning Outcome 2	Identifythe importance of various registers.	06	05 (PT)
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		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	0	4				1	1	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Interpret various type of micro-operations and instructions.**
LO Description	Understand Register transfer language and micro-operations.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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)	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	09	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer	**14**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				1	2	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Interpretvarious type of micro-operations and instructions.**
LO Description	Identifythe importance of various registers.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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.	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 / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer / Quiz	**5 (PT)**	**Test Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				1	3	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Interpretvarious type of micro-operations and instructions.**
LO Description	Explain Instruction cycle and types of instructions.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	9	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer	**14**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4				1	4	

COURSE NAME	COMPUTER ARCHITECTURE
CO Description	Interpretvarious type of micro-operations and instructions.
LO Description	Discuss Interrupt and its types.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Input-Output and Interrupt: Input-Output Configuration Input-Output Instructions Program Interrupt Interrupt Cycle	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	06	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Pen Paper Test	Question Answer / Quiz	05 (PT)	Test Paper	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		c	0	4				2	1	

COURSE NAME	COMPUTER ARCHITECTURE
CO Description	**Outline data processing of computer system.**
LO Description	Express different CPU Organization and instruction formats.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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	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 / Books / E-Contents	NIL

	address and Zero address						

SCHEME OF ASSESSMENT					
S. No.	**Method of Assessment**	**Description of Assessment**	**Maximum Marks**	**Resources Required**	**External / Internal**
1	**Assignment/Quiz**	Question Answer / Quiz	**06(TW)**	**Test Paper**	**Internal**
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	**Branch Code**			**Course Code**			**CO Code**	**LO Code**	Format No. **4**
		c	*0*	*4*				*2*	*2*	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Outline data processing of computer system.**
LO Description	Explain Data transfer and manipulation.

SCHEME OF STUDY							
S. No.	**Learning Content**	**Teaching –Learning Method**	**Description of T-L Process**	**Teach Hrs.**	**Pract. /Tut Hrs.**	**LRs Required**	**Remarks**

1	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).	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	12	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer	**14**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		c	*0*	*4*				*3*	*1*	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Classifydifferent methods of computer input output processing.**
LO Description	Explain I/O interface and mode of data transfer.

SCHEME OF STUDY							
S. No.	**Learning Content**	**Teaching – Learning Method**	**Description of T-L Process**	**Teach Hrs.**	**Pract. /Tut Hrs.**	**LRs Required**	**Remarks**
1	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	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	08	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT					
S. No.	**Method of Assessment**	**Description of Assessment**	**Maximum Marks**	**Resources Required**	**External / Internal**
1	**Pen Paper Test**	Question Answer	**08**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

OUTCOME	c	0	4				3	2	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Classifydifferent methods of computer input output processing.**
LO Description	Relate various types of Priority Interrupt.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Priority Interrupt Daisy-Chaining Priority Parallel Priority Interrupt Priority Encoder Interrupt Cycle	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	06	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer	**06**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

	OUTCOME	c	0	4				3	3	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Classifydifferent methods of computer input output processing**
LO Description	Draw DMA architecture.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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 ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Assignment**	Question Answer / Quiz	**04(TW)**	**Test Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

	OUTCOME	C	0	4				4	1	

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Illustratevarious level of a memory hierarchy.**
LO Description	Describe Memory Hierarchy and types of cache memory.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	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	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	14	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer	**14**	**Test Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

	OUTCOME	C	0	4				4	2

COURSE NAME	**COMPUTER ARCHITECTURE**
CO Description	**Illustratevarious level of a memory hierarchy.**
LO Description	Discuss the importance of virtual memory management.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Virtual memory:** Address Space and Memory space, Address mapping using pages Memory management hardware	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	08	0	Handouts / Books / E-Contents	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Pen Paper Test**	Question Answer / Quiz	**10(PT)**	**Test Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/3

Branch	COMPUTER SCIENCE AND ENGINEERING/INFORMATIONTECHNOLOGY	Semester	Third

Course Code	304	Course Name	DATA STRUCTURE AND ALGORITHM

		Teaching Hrs	Marks
Course Outcome 1	**APPLY BASICS OF DATA STRUCTURES, POINTERS & DYNAMIC MEMORY MANAGEMENT IN A GIVEN PROBLEM SITUATION.**	**30**	**34**
Learning Outcome 1	EXPLAIN DATA TYPES & ABSTRACT DATA TYPES (ADT), POINTERS, STRUCTURE AND DYNAMIC MEMORY.	14	14
Contents	Overview of Data, Abstract Data Types and Data-Structure. **Classification of Data Structure:** Linear, Non-Linear, Primitive, Non-Primitive, etc. **Pointers:** Introduction, Declaring and initializing pointers, Accessing variables using pointers, Pointer arithmetic, Array of Pointers, Row-major & Col-major implementation of 2-D array. **Structure:** Definition, Declaration, Initializing Structure, Accessing Structure elements, Array of Structure, Pointer to Structure. **Dynamic Memory Allocation/Deallocation:** malloc(), calloc(), free(), realloc().		

Learning Outcome 2	INTERPRET STRUCTURE & POINTERS, DYNAMIC MEMORY ALLOCATION AND DE-ALLOCATION.	08	10
Contents	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)		
Course Outcome 2	**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	USE ARRAY AND LINKED LIST FOR STACK'S AND QUEUE'S FUNCTIONS.	12	10
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)		

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.		
Method of Assessment	LO - 1 Paper pen test (End Semester Exam) LO - 2 Paper pen test/Assignment: Term Work (Internal) LO - 3 Lab Assessment (Internal)		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No.
		C	0	4	3	0	4	1	1	4

COURSE NAME	**Data structure and algorithms**
CO-1 Description	**APPLY BASICS OF DATA STRUCTURES, POINTERS & DYNAMIC MEMORY MANAGEMENT IN A GIVEN PROBLEM SITUATION.**
LO-1 Description	EXPLAIN DATA TYPES & ABSTRACT DATA TYPES (ADT), POINTERS, STRUCTURE AND DYNAMIC MEMORY.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.1	Overview of Data, Abstract Data Types and Data-Structure. **Classification of Data Structure:** Linear, Non-Linear, Primitive, Non-Primitive, etc. **Pointers:** Introduction, Declaring and initializing pointers, Accessing variables using pointers, Pointer arithmetic, Array of Pointers, Row-major & Col-major implementation of 2-D array. **Structure:** Definition, Declaration, Initializing Structure, Accessing Structure elements, Array of Structure, Pointer to Structure, **Dynamic Memory Allocation/Deallocation:** malloc(), calloc(), free(), realloc().	Traditional Lecture method + Handout	Teacher will explain the contents and provide handouts to students.	14	-	Handout	

	SCHEME OF ASSESSMENT					
	S. No.	**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)					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	1	2	

COURSE NAME	**Data structure and algorithms**
CO Description	**APPLY BASICS OF DATA STRUCTURES, POINTERS & DYNAMIC MEMORY MANAGEMENT IN A GIVEN PROBLEM SITUATIONS.**
LO Description	INTERPRET STRUCTURE & POINTERS, DYNAMIC MEMORY ALLOCATION & DE-ALLOCATION.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.2	Pointers and constant pointer, self referential structures, Dynamic structures, Comparative Study of Union & Structure.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handouts to students.	08	-	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen test (Progressive test -1)	A Student will be asked to interpret structure and pointer, Union & Structure, Memory allocation & De-alloc.	**10**	**Test Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	1	3	

COURSE NAME	**Data structure and algorithms**
CO-1 Description	**APPLY BASICS OF DATA STRUCTURES, POINTERS & DYNAMIC MEMORY MANAGEMENT IN A GIVEN PROBLEM SITUATIONS.**
LO-3 Description	USE STRUCTURE & POINTERS FOR A GIVEN PROBLEM SITUATION.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.3	Invoking functions by passing the pointers, Declaration and use of structure.	Traditional Lecture method	Teacher will explain the contents and provide a Lab manual to the students. Teacher will provide guided practice to apply pointers and structures in a given situation.	-	8	Lab Manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Lab Assessment	Students will be asked to execute a program to illustrate the use of structure and pointer.	**10**	Lab manual	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	2	1	

COURSE NAME	**Data structure and algorithms**
CO-2 Description	**USE SEARCHING, SORTING & HASHING TECHNIQUES TO SOLVE REAL WORLD PROBLEMS.**
LO-1 Description	EXPLAIN COMPLEXITY ANALYSIS AND VARIOUS SEARCHING, SORTING & HASHING TECHNIQUES.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
2.1	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.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	12	---	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	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/ FACULTY (IF ANY)					

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	2	2	
COURSE NAME	**Data structure and algorithms**									

CO-2 Description	USE **SEARCHING/SORTING & HASHING TECHNIQUES TO SOLVE REAL WORLD PROBLEMS.**
LO-2 Description	WRITE PROGRAM FOR LINEAR SEARCH & BINARY SEARCH TECHNIQUES.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
2.2	Algorithm of linear search and binary search technique.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	-	08	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Lab assessment	Students will be asked to write a program for linear search and binary search technique for a given problem.	**10**	Lab Manual	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	2	3	
COURSE NAME	**Data structure and algorithms**									

CO-2 Description	**USE SEARCHING/SORTING & HASHING TECHNIQUES TO SOLVE REAL WORLD PROBLEMS.**
LO-3 Description	WRITE PROGRAM FOR SORTING TECHNIQUES.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
2.3	Algorithm of bubble sort, insertion sort technique.	Traditional Lecture method	Teacher will explain the contents and provide Lab Manual to students. Teacher will provide a guided Practice to write an algorithm of bubble sort , insertion sort.	-	14	Lab manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Lab Assessment	Student will be asked to implement functions of sorting Techniques.	**10**	**Lab Manual**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)										
RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	0	4	3	0	4	3	1	

COURSE NAME	**Data structure and algorithms**
CO-3 Description	**APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.**
LO-1 Description	EXPLAIN THE BASIC STRUCTURE OF LINKED LIST WITH ITS VARIOUS OPERATIONS.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
3.1	**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.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	10	-	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen Test(End semester Exam)	Student will be asked to Define the basic structure of Linked List & Perform various operations of it.	**14**	Test paper	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)									
RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	0	4	3	0	4	3	2	

COURSE NAME	**Data structure and algorithms**
CO-3 Description	**APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.**
LO-2 Description	ILLUSTRATE STACK AND QUEUE DATA STRUCTURE.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
3.2	**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.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	08	-	Hand out	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	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

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	3	3	

COURSE NAME	**Data structure and algorithms**
CO-3 Description	**APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.**
LO-3 Description	APPLY LINEAR DATA STRUCTURE TO SOLVE STACK'S & QUEUE'S PROBLEMS.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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	-	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen Test(End semester Exam)	Student will be asked to apply stack and queue data structure for a given problem.	14	Test Paper	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	3	4	

COURSE NAME	**Data structure and algorithms**
CO-3 Description	**APPLY APPROPRIATE LINEAR DATA STRUCTURE IN PROBLEM SOLVING.**
LO-4 Description	USE ARRAY AND LINKED LIST FOR STACK'S AND QUEUE'S FUNCTIONS.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
3.4	Perform various operations on stack like insertion (PUSH) & deletion (POP). Perform various operations on queue like insertion and deletion.	Traditional Lecture method	Teacher will explain the contents and provide Lab Manual to students.	-	12	Lab Manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Lab Assessment	Students will be asked to insert and delete elements in a stack and queue, perform various operations in linked list.	10	Lab Manual	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	4	1	

COURSE NAME	Data structure and algorithms
CO-4 Description	ILLUSTRATE **NON-LINEAR DATA STRUCTURE.**
LO-1 Description	DIFFERENTIATE AMONG VARIOUS TYPES OF BINARY TREE.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
4.1	**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.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students.	13	-	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen test (End semester Exam)	For the given tree, student will be asked to ● define basic terminologies of tree. ● Differentiate various types of Binary Tree. ● insert/delete the given element(s) in the tree.	**14**	**Test paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	4	4	2	

COURSE NAME	Data structure and algorithms
CO-4 Description	SOLVE PROBLEMS INVOLVING NON-LINEAR DATA STRUCTURE.
LO-2 Description	EXPLAIN MINIMUM SPANNING TREE AND DIFFERENT TYPES OF GRAPH WITH REPRESENTATION.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
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 will explain the contents and provide handout to students.	10	-	Handout	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

		Paper Pen test/ Assignment(Term work)	Students will be asked to ● Explain basic terminologies of graph data structure. ● differentiate between breadth first search and depth first search. ● Explain minimum spanning tree.	**10**	**Handout**	**Internal**

	ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)
CO-4 Description	**SOLVE PROBLEMS INVOLVING NON-LINEAR DATA STRUCTURE.**
LO-3 Description	WRITE AN ALGORITHM FOR TREE AND GRAPH TRAVERSAL.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
4.3	Algorithm 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 explain the contents and provide Lab Manual to students.	-	8	Lab manual	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal

	Lab Assessment	Student will be asked to ● Write tree traversal algorithms. ● Write graph traversal algorithm.	**10**	**Lab Manual**	**Internal**
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)					

LIST OF EXPERIMENT

S.NO.	EXPERIMENT	CO	LO
1.	Program to swap values of two variables by passing pointers.	CO-1	LO-3 <External>
2.	Program to display information (name, roll no, cgpa etc) of students in a class using structure.		
3.	Program to search an item from 'n' different items using i) Linear Search ii) Binary Search	CO-2	LO-2 <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>
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>
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>

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR OPERATING SYSTEM	FORMAT-3	Sheet No. 1/3
Branch	**Computer Science and Engineering/Information Technology**	**Semester**	**III**
Course Code	**302**	**Course Name**	**OPERATING SYSTEM**

Course Outcome 1	Describe basics Concept of Operating System and its functionality.	**Hrs**	**Marks**
Learning Outcome 1	Apply the function and objectives of OS.	8	12
Contents	Basics of Operating System System components and functions.		
Method of Assessment	**Question Paper -External- End Sem Exam**		
Learning Outcome 2	List Types of Operating System its structure and System call.	10	10
Contents	Types of Operating System: Batch processing, Multiprogramming, Multitasking, Multiprocessor: symmetric and asymmetric, Time Sharing, Real Time, Network & Distributed OS. OS Structure: Monolithic, Microkernel and Layered. System Call.		
Method of Assessment	**Question Paper -Internal Progressive Test**		
Learning Outcome 3	Identify the concept of BIOS Setup and Driver Installation.	7	10
Contents	Installation, Up gradation, Troubleshooting of Windows Device Driver Installation, BIOS Setup. Installation and Troubleshooting devices.		
Method of Assessment	**Lab Manual - External-Practical**		

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

Learning Outcome 3	List the type of Disk scheduling algorithms and identify RAID Technology concept.	10	10
Contents	Disc Structure, Seek Time, Latency Time, Rotational Delay, Transfer Time, and Bandwidth. Disk Scheduling Algorithm: FCFS, SSTF, Scan, C-Scan, Look, CLook. 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.	15	15
Contents	Goal of Memory Management, Overlays, and Swapping, Logical and Physical Address, Allocation Techniques: First Fit, Best Fit, Worst Fit, Contiguous Memory Allocation, Non-Contiguous Memory Allocation. Fragmentation, Paging, page Table. Segmentation Difference between paging and segmentation		
Method of Assessment	**External- End Sem Exam**		
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 paging.		
Method of Assessment	**External- End Sem Exam**		
Learning Outcome 3	Develop Program using page replacement algorithm	5	10
Contents	Working of Page replacement algorithm.(FIFO LRU and Optimal)		
Method of Assessment	**Internal Practical-Lab Work**		

Course Outcome 5	Describe techniques of file system & Security mechanism in OS	Hrs	Marks
Learning Outcome 1	Explain the concept of file and directory system.	6	10
Contents	File concept in OS. File System and its types. File access methods. Directory structure.		
Method of Assessment	**External- End Sem Exam**		
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**		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	1	1	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO1)	Describe basics Concept of Operating System and its functionality.
LO Description (LO1)	Apply the function and objectives of OS.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	1.1 Basics of Operating System, 1.2 System components and functions.	Traditional Lecture method + Handout	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge.	08		Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	For the given content student will be asked for Basics of Operating System, System components and functions.	**12**	**Question Paper**	**External- End Sem Exam**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY) (NIL)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	1	2	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO1)	Describe basics Concept of Operating System and its functionality.
LO Description (LO2)	List Types of Operating System its structure and System call.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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.	Traditional Lecture method + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	10		Handout + Videos+e content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	For the given content student will be asked for type of OS its structure and System call.	**10**	**Question Paper**	**Internal Progressive Test**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	1	3	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO1)	Describe basics Concept of Operating System and its functionality.
LO Description (LO3)	Identify the concept of BIOS Setup and Driver Installation.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	1.6installation, Up gradation, Troubleshooting of Windows 1.7Device Driver Installation, BIOS Setup. Installation and Troubleshooting devices.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		07	Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	For the given content student will be asked for installation, Up gradation, Troubleshooting of Windows Device Driver Installation, BIOS Setup.	**10**	**Lab Manual**	**External-Practical**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)														
RGPV (Diploma Wing) Bhopal			**SCHEME FOR LEARNING OUTCOME**			**Branch Code**			**Course Code**			**CO Code**	**LO Code**	Format No. **4**
						C	*0*	*4*	*3*	*0*	*2*	*2*	*1*	
COURSE NAME	**OPERATING SYSTEM**													
CO Description (CO2)	Describe Computer System Processes management concept and apply concept on given problem.													
LO Description (LO1)	Identify Process management concept													

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	2.1 Process concept, Process state diagram. 2.2 Process control block. 2.3 CPU Scheduler, Context Switch.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	10		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	For the given content student will be asked for process state diagram PCB and types of CPC scheduler.	**10**	**Assignment**	**Internal (Term work)**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	2	2	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO2)	Describe Computer System Processes concept and apply concept on given problem.
LO Description (LO2)	Explain different CPU Scheduling algorithm.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	2.4 Scheduling criteria, Scheduling. 2.5 Algorithms- FCFS, SJF, Priority, RR, Multilevel queue scheduling, Multilevel Feedback queue scheduling.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		10	Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	For the given content student will be asked for write algorithm of different CPU scheduling.	**10**	**Lab Manual**	**Internal Practical- lab work**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)									
RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	**Branch Code**			**Course Code**			**CO Code**	**LO Code**	Format No. **4**
		C	*0*	*4*	*3*	*0*	*2*	*3*	*1*	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO3)	Describe Deadlock and disk management.
LO Description (LO1)	Identify the various conditions of deadlock.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	3.1 Basic Concept of deadlock, Necessary conditions for deadlock. 3.2 Resource allocation graph. 3.3 Method for handling deadlock.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	10		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	Student will be asked for necessary condition for deadlock and resource allocation graph.	**10**	**Question Paper**	**Internal Progressive**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	3	2	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO3)	Describe Deadlock and disk management.
LO Description (LO2)	To Evaluate the performance of Banker's algorithm.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	3.4 Deadlock prevention scheme. 3.5 Deadlock avoidance, Banker's Algorithm. 3.6 Deadlock Detection.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	05		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	Student will be asked for Deadlock detection, Prevention scheme and Solve numerical based on banker's algorithm.	**10**	**Question Paper**	**External- End Sem Exam**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	3	3	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO3)	Describe Deadlock and disk management.
LO Description (LO3)	List the type of Disk scheduling algorithms and identify RAID Technology concept.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	3.7 Disc Structure, Seek Time, Latency Time, Rotational Delay, Transfer Time, and Bandwidth. 3.8 Disk Scheduling Algorithm: FCFS, SSTF, Scan, C-Scan, Look, CLook. 3.9 RAID technology definition, uses, advantages. 3.10 Format disk and Create disk partition	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		10	Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	Student will be asked for disk scheduling algorithm and disk partition .	**10**	**Lab Manual**	**External-Practical**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	4	1	

COURSE NAME	OPERATING SYSTEM
CO Description (CO4)	Explain concept of Memory Management
LO Description (LO1)	Identify Basics of Memory Management and its Schemes.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	4.1 Goal of Memory Management, Overlays, and Swapping, Logical and Physical Address, Allocation Techniques: First Fit, Best Fit, Worst Fit, Contiguous Memory Allocation, Non-Contiguous Memory Allocation. 4.2 Fragmentation, Paging, page Table. 4.3 Segmentation Difference between paging and segmentation	Traditional Lecture method + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	15		Videos+econtent	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Paper Pen/Quiz/Assignment**	1. Students will be asked Swapping Physical address - Logical address allocation scheme and Fragmentation. 2. Paging and segmentation.	**15**	**Question Paper**	**External- End Sem Exam**

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	4	2	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO4)	Describe concept of Memory Management.
LO Description (LO2)	Explain concept of Virtual Memory and paging.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	4.4 Basic concept of Virtual Memory. 4.5 Demand paging Basic concept. 4.6 Steps of handling a page fault, Pure demand paging.	Traditional Lecture method + + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	10		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper Pen/Quiz/Assignment	Students will be asked for Virtual memory Demand paging, Pure demand paging and How to handle page fault.	**15**	**Question Paper**	**External- End Sem Exam**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	*0*	*4*	*3*	*0*	*2*	*4*	*3*	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO4)	Apply concept of Memory Management
LO Description (LO3)	Develop Program using page replacement algorithm

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Working of Page replacement algorithm.(FIFO LRU and Optimal)	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		05	Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper Pen/Quiz/Assignment	Students will be asked to create algorithm, flowchart ,design and run program for Page replacement algorithm(FIFO and LRU)	**10**	**Lab Manual**	**Internal Practical-Lab Work**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	5	1	

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO5)	Describe techniques of file system & Security mechanism in OS
LO Description (LO1)	Explain the concept of file and directory system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	5.1 File concept in OS. 5.2 File System and its types. 5.3 File access methods. 5.4 Directory structure.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	06		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper Pen/Quiz/Assignment	Student will be asked for File System and its types, File access methods and directory structure.	**10**	**Question Paper**	**External- End Sem Exam**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	4	3	0	2	5	2	Format No. 4

COURSE NAME	**OPERATING SYSTEM**
CO Description (CO5)	Describe techniques of file system & Security mechanism in OS
LO Description (LO2)	Identify the security policies and related issues.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	5.5 Goal of Protection. 5.6 Domain of Protection. 5.7 Authentication. 5.8 Security Issues.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge	06		Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper Pen/Quiz/Assignment	Students will be asked for Protection Authentication and Security.	**08**	**Question Paper**	**External- End Sem Exam**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	2	5	3	

COURSE NAME	OPERATING SYSTEM
CO Description (CO5)	Describe techniques of file system & Security mechanism in OS.
LO Description (LO3)	Apply concept of Mobile operating system and check its version.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	5.9 Various mobile Operating Systems. 5.10 Timeline of android and version, 5.11 Download and install Mobile OS.	Traditional Lecture method + Handout + Videos	Teacher will explain the contents and provide handout to students. Teacher will conduct quiz to make students practice their knowledge		08	Handout + Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper Pen/Quiz/Assignment	Students will be asked 1. To explain basic concept of Mobile Operating System. 2.To install mobile Operating system	**10**	**Lab Manual**	**External Practical**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (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

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT- 3	Sheet No. 1/3

Branch	Computer Science and Engineering/Information Technology	Semester	3rd
Course Code		Course Name	Python Programming

Course Outcome 1	**Interpret basic constructs of python programming**	Teach Hrs	Marks
Learning Outcome 1	**Describe steps to setup python development environment, features and modules.**	8	5
Contents	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.		
Method of Assessment	Lab Assessment(File)		
Learning Outcome 2	**Explain different data types, operators, and user defined functions in Python.**	12	10
Contents	Keywords,creating variables, global variables. Various data types, type conversion. Concept of input output. Unary, binary and ternary operators. Arithmetic operators, Assignment operators, Relational operators, Logical operators, Bitwise operators. Single line and multiline comments. User defined functions.		
Method of Assessment	Quiz		
Learning Outcome 3	**Write programs using basic constructs.**	12	10
Contents	Working on conditional statements (if-else-elseif) and their flow chart. Iterative statements (for, while) and their flow chart. Loop control statements - break, continue, pass. Use math module.		
Method of Assessment	Lab Assessment(File)		
Course Outcome 2	**Develop programs using structure types and exception handling.**	*Teach Hrs*	*Marks*
Learning Outcome 1	**Use built in functions to manipulate strings and lists.**	10	10
Contents	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().		
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. Converting tuple to list. Iterating over tuple, check if an item exists in tuple. Tuple length, join two tuples. Create set, access items of set, add items to set, length of set. Remove an item in set, join two sets, and update set. Union operation of set. Create dictionary, keys-value pair in dictionary. Add, remove and access items of the dictionary. Change item value. Iteration over dictionary, Check if key exists, length of dictionary, copy dictionary.		
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 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.		
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 Variables and methods in a class. Class or Static Variables in class. Creating objects and access class members using dot(.) operator. Constructors in class, default constructor, parameterized constructor, self keyword, destructors in python.		
Method of Assessment	Programming		
Learning Outcome 2	**Develop GUI using tkinter interface.**	10	10
Contents	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.		
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		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	1	1	

COURSE NAME	**Python Programming**
CO Description (CO1)	**Interpret basic constructs of python programming.**
LO Description (LO1)	**Describe steps to setup python development environment, features and modules.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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 will explain the contents and provide handouts.	04	04	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Lab Assessment(File)	Students will be asked to write questions in lab files.	**5**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	1	2	

COURSE NAME	**Python Programming**
CO Description (CO1)	**Interpret basic constructs of python programming.**
LO Description (LO2)	**Explain different data types, operators, and user defined functions in Python.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Keywords,creating variables, global variables. Various data types, type conversion. Concept of input output. Unary, binary and ternary operators. Arithmetic operators, Assignment operators, Relational operators, Logical operators, Bitwise operators. Single line and multiline comments. User defined functions.	Traditional lecture method and handouts	Teacher will explain the contents and provide handouts.	12	00	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Quiz**	Multiple choice questions	**10**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	1	3	

COURSE NAME	**Python Programming**
CO Description (CO1)	**Interpret basic constructs of python programming.**
LO Description (LO3)	**Write programs using basic constructs.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Working on conditional statements (if-else-elseif) and their flow chart. Iterative statements (for, while) and their flow chart. Loop control statements - break, continue, pass. Use math module.	Lab practicals with traditional lecture method and handouts	Teacher will explain the contents and provide handouts. Students will program it in the lab	4	08	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Lab Assessment(File)	Students will be asked to write programs in the lab and prepare lab files.	**10**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	2	1	

COURSE NAME	**Python Programming**
CO Description (CO2)	**Develop programs using structure types and exception handling.**
LO Description (LO1)	Use built in functions to manipulate strings and lists.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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 method and handouts	Teacher will explain the contents and provide handouts. Students will program it in the lab	3	7	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Programming	Students will be asked to write code for a given task.	**10**	**Question Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	2	2	

COURSE NAME	**Python Programming**
CO Description (CO2)	**Develop programs using structure types and exception handling.**
LO Description (LO2)	**Write programs using tuples, dictionaries and sets.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Create tuple, indexing in tuple, access items of tuple. Converting tuple to list. Iterating over tuple, check if an item exists in tuple. Tuple length, join two tuples. Create set, access items of set, add items to set, length of set. Remove an item in set, join two sets, and update set. Union operation of set. Create dictionary, keys-value pair in dictionary. Add, remove and access items of the dictionary. Change item value. Iteration over dictionary, Check if key exists, length of dictionary, copy dictionary.	Lab practicals with traditional lecture method and handouts	Teacher will explain the contents and provide handouts. Students will program it in the lab	2	5	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Lab Assessment(File)	Students will be asked to write programs in the lab and prepare lab files.	**5**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		C	0	4	3	0	3	2	3	

COURSE NAME	**Python Programming**
CO Description (CO2)	**Develop programs using structure types and exception handling.**
LO Description (LO3)	**Use exception handling, numpy module to manipulate arrays.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Need 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 explain the contents and provide handouts. Students will program it in the lab	4	7	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	**Quiz**	Multiple choice questions	**10**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	3	1	

COURSE NAME	**Python Programming**
CO Description (CO3)	**Apply the concepts of classes, file handling and GUI designing.**
LO Description (LO1)	Write programs using classes, objects, constructors and access class members.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Basic syntax and structure of a Class. Declare/define Variables and methods in a class. Class or Static Variables in class. Creating objects and access class members using dot(.) operator. Constructors in class, default constructor, parameterized constructor, self keyword, destructors in python.	Lab practicals with traditional lecture method and handouts	Teacher will explain the contents and provide handouts. Students will program it in the lab	6	7	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Programming	Students will be asked to write code for a given task.	**15**	**Question Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	3	2	

COURSE NAME	**Python Programming**
CO Description (CO3)	**Apply the concepts of classes, file handling and GUI designing.**
LO Description (LO2)	**Develop GUI using tkinter interface.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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 explain the contents and provide handouts. Students will program it in the lab	3	7	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Lab Assessment(File)	Students will be asked to write programs in the lab and prepare lab files.	**10**	**Question Paper**	**Internal**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		C	0	4	3	0	3	3	3	

COURSE NAME	**Python Programming**
CO Description (CO3)	**Apply the concepts of classes, file handling and GUI designing.**
LO Description (LO3)	**Use built in library to perform file/directory related operations.**

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
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 explain the contents and provide handouts. Students will program it in the lab	4	8	Handout + Videos+ e-content	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Programming	Students will be asked to write code for a given task.	**15**	**Question Paper**	**External**

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

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SNo	Suggested List of Experiments	CO	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 WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/3

Branch	ALL BRANCHES	Semester	III

Course Code		Course Name	PROFESSIONAL DEVELOPMENT-III

Course Outcome 1	**Student will be able to perform as the team leader of small team for solving a team problem in the given situation**	Teach Hrs	Marks
Learning Outcome 1	Student will be able to demonstrate his/her understanding of leadership required in a team work performance	10	10
Contents	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders		
Method of Assessment	Paper pen test		
Learning Outcome 2	Student will be able to play role of the leader of a team for solving a team problem in the given situation	10	15
Contents	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders		
Method of Assessment	Student's role play		
Course Outcome 2	**Student will be able to apply professional ethics in a given problem situation**		
Learning Outcome 1	Student will be able to **demonstrate** his/her understanding of professional ethics	10	10
Contents	Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.		

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 ethical issue, identification of the ethical stand, searching various possible solutions for the problem keeping ethical stand in focus, selection of 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 lifelong learning, identification of learning needs		
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 learning plan, examples.		
Method of Assessment	Assessment through student activity		

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	0	2	3	0	5	1	1	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to perform as the team leader of small team for solving a team problem in the given situation**
LO Description	**Student will be able to demonstrate his/her understanding of leadership required in a team work performance**

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Important qualities of team leader:-
will be able to

1. to take initiatives
2. take responsibility on behalf of group
3. to visualize the team event and plan things for the event
4. to take interest to carry out related activities

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

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	0	2	3	0	5	1	2	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to perform as the leader of small team for solving a team problem in the given situation**
LO Description	**Student will be able to play role of the leader of a team for solving a team problem in the given situation**

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Team leaders, importance of team leader, role of team leaders, important qualities of good team leaders, behaviors of good team leaders	Case Study method	Teacher will organize a students' team event in class/ department. Few students will be asked to play roles of team members and the leader to solve team problems under given situation. Other students will observe. Afterward, teacher will discussion with students. Teacher will organize similar events for practice.	02	08	video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Student's role play	The teacher will organize small team events in batches in which individual students will be asked to play role of leader to solve a team problem, under given situation. Teacher will observe and assess the extent of leader's behavior performed by students on the basis of performance indicators	15	Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

The assessment will be done on basis of following performance indicators:-

1. Extent to which student take initiatives
2. Extent to which student take responsibility on behalf of group
3. Extent to which student visualize the team event and plan things for the event
4. Extent to which student take interest to carryout team related activities

5. Extent to which student take interest in solving team related problems

RGPV (Diploma Wing) Bhopal	**SCHEME FOR LEARNING OUTCOME**	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
					3	**0**	**5**	**2**	**1**	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to apply professional ethics in a given problem situation**
LO Description	Student will be able to **demonstrate** his/her understanding of professional ethics

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Professional ethics, its need and importance, seven ethics common to all professionals, general code of ethics for engineers, ethical issues for engineers, common problems related to professional ethics, ethical issues, identification of ethical issues in cases for engineers.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	A test will be designed and administered by the teacher to assess the understanding of student. Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	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)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
					3	0	5	2	2	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to apply professional ethics in a given problem situation**
LO Description	Student will be able to **apply** appropriate professional ethics in a given problem situation

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	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.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	A case based test on problem of ethical issue for an engineer will be designed and administered by the teacher to assess the ability of students to solve the ethical problem; Assessment will be done through Rating Scale.	10	Test paper and Rating Scale	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)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	0	2	3	0	5	3	1	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to plan self-learning to complete the given task**
LO Description	**Student will be able to identify the self-learning needs for completing the given task**

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Lifelong learning, its examples, self-directed learning, its examples, important steps in lifelong learning, identification of learning needs	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment through student activity	A Self-assessment portfolio will be prepared by the student on the task assigned by the teacher. Assessment of portfolio will be done through Rating Scale.	10	Portfolio format and Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. **Lifelong learning**

All **learning** activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective. It is voluntary, self-initiated and self-directed learning.

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

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. 4
		M	0	2	3	0	5	3	2	

COURSE NAME	**Professional Development-III**
CO Description	**Student will be able to plan self directed learning to complete the given task**
LO Description	**Student will be able to plan self directed learning for completing the given task**

SCHEME OF STUDY

S. No.	Learning Content	Teaching-Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Need for planning, need for planning self directed learning, planning self directed learning, self directed learning plan, examples.	Traditional lecture method + Case Study	Teacher will explain about the contents along-with examples/cases, will give assignment of preparing self-directed learning plan for practice, will conduct tutorials and remedial.	05	05	Handout, video film*	*Teacher will suggest a suitable online video to be viewed by students

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Assessment through student activity	A self directed learning plan will be prepared by the student on the task assigned by the teacher. Assessment of the plan will be done through Rating Scale.	10	Plan format and Rating Scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

1. 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

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)