

ANNEXURE – I

St. Vincent Pallotti College of Engineering & Technology, Nagpur

Department of Vocation (B. VOC)

Teaching Scheme for B.VOC Third Year 2024-25

SEMESTER V (Virtual Reality & Augmented Reality)

Sr. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem. Examination	Total
General Education Component (GEC)									
1	24BV501T	Entrepreneurship Skills - I	3	-	-	3	40	60	100
2	24BV502T	Employability Skills - II	3	-	-	3	40	60	100
3	24BV501P	Entrepreneurship Skills – I Lab	-	-	3	3	25	25	50
4	24BV502P	Employability Skills - II Lab	-	-	3	3	25	25	50
Total – GEC			6	-	6	12	130	170	300
Skill Education Component (SEC)									
5	24VA503S	AR-VR DEVELOPER(*)	-	-	8	8	50	100 (**)	150
6	24VA504S	Internship	-	-	10	10	25	75	100
Total – SEC			-	-	18	18	75	175	250
Grand Total			6	-	24	30	205	345	550

Assessment Competent Authority: General Education Component, 24BV501T/P, 24BV502T/P, Skill Component 24VA504S: by college,

(*) AR-VR DEVELOPER: MES/Q0509, MES/N2513, MES/N2515, MES/N2516, ME/N0104, MES/N2816

(**) 24VA503S Assessment by Sector Skill Council – MESC


SEMESTER VI (Virtual Reality & Augmented Reality)


Sr. No.	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem. Examination	Total
General Education Component (GEC)									
1	24BV601T	Entrepreneurship Skills - II	3	-	-	3	40	60	100
2	24BV602T	Employability Skills - III	3	-	-	3	40	60	100
3	24BV601P	Entrepreneurship Skills – II Lab	-	-	3	3	25	25	50
4	24BV602P	Employability Skills - III Lab	-	-	3	3	25	25	50
Total – GEC			6	-	6	12	130	170	300
Skill Education Component (SEC)									
5	24VA603S	AR-VR PRODUCER(*)	-	-	8	8	50	100 (**)	150
6	24VA604S	Project	-	-	10	10	25	75	100
Total – SEC			-	-	18	18	75	175	250
Grand Total			6	-	24	30	205	345	550


Assessment Competent Authority: General Education Component 24BV601T/P, 24BV602T/P: Skill Component 24VA604S: by college

24VA603S (*) Assessment by Sector Skill Council – MESC

24VA603S (**) AR-VR PRODUCER: MES/Q2509, MES/N2865 TO MES/N2872


Dr. Guresh Rangankar
BOS, Chairman (B.VOC)


Dr. Pramod Lanjewar
Dean (Academics)


Dr. Vijay Wadhai
Principal



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B. VOC. Scheme of Examination & Syllabus 2024-25

SOFTWARE DEVELOPMENT, CYBER SECURITY, VIRTUAL REALITY & AUGMENTED REALITY



FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24BV501T	Entrepreneurship Skills-I	3	--	--	3	40	60	100

Course Objectives	Course Outcomes
<ul style="list-style-type: none"> To empower an entrepreneurial mindset and business skills to enhance job prospects and develop entrepreneurship skills. To introduce the necessary skills to develop ventures beyond the idea/prototype stage. 	<ul style="list-style-type: none"> Apply self-discovery techniques and principles of effectuation to identify entrepreneurial opportunities and build suitable venture teams. Analyze customer needs and design innovative solutions using Design Thinking, Value Proposition Canvas, and Lean Business Models. Evaluate real-world startup case studies (Verloop, Desi Hangover) to understand idea generation, problem identification, market segmentation, and strategy implementation. Assess advanced case studies (Honey Twigs, Inzipira, NUOS Home Automation) to develop skills in demand validation, competitive analysis, business model creation, and Lean Canvas development.
Unit I : Self Discovery:	[10 HRS]
Self Discovery: Find your flow (passion), Principles of Effectuation, Selecting Venture Team, Opportunity Discovery: Identifying problem worth solving.	
Unit II : Design Thinking	[10 HRS]
Design Thinking, Look for Solutions. Customer & Solution: Customers & Markets, Value Proposition Canvas, Basics of Business Model and Lean Approach, Craft your Business Model.	
Unit III : Case Study 1	[10 HRS]
Verloop Case Study: Genesis of the idea, problem statement, market selection, Market segments, strategy implemented. Desi Hangover Case Study : Genesis of the idea, problem statement, market selection, market opportunists , Market segment, demand validation.	
Unit IV : Case Study 2	[15 HRS]
Honey Twigs Case Study: Genesis of the idea, problem statement, market selection, market opportunists, categorize the problem, demand validation. Inzipira Case Study : Genesis of the idea, problem statement, market selection, product features comparison like Product Benefits - UVP, Price, Branding, Market Review, key competitive advantages, 2*2 matrix on Create, Enhance, Reduce, Eliminate NUOS Home Automation Case Study: Problem Identification, identify the type of Business Model, estimating the market size, Create the Lean Canvas	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Entrepreneurial Development	S.S.Khanka	2011	S. Chand
2	Entrepreneurial Development	E. Gordon, K. Natrajan	6 th revised	Himalaya Publishing House

		Oct-2022	1	Applicable for 2026-27
Chairman - BoS	Dean – Academics	Date of Release	Version	



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FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24BV501P	Entrepreneurship skills-I Lab	--	--	3	3	25	25	50

Course Objectives	Course Outcomes
<ul style="list-style-type: none"> To develop entrepreneurial abilities by providing background information about support systems , skill sets , financial and risk covering institutions and other for building an enterprise so that future budding entrepreneurs can make right decisions for starting and running a venture. 	<ul style="list-style-type: none"> To build foundation of Entrepreneurship Development and its theories. To explore entrepreneurial skills and management function. To identify the type of entrepreneur and the steps involved in an entrepreneurial venture. To understand various steps involved in starting a venture and to explore marketing methods & new trends in entrepreneurship.

List of Practical / Activities



1. Identify problem worth solving
2. Propose solution based on Design Thinking - Desirability, Feasibility and viability
3. Identify customer segments and early adopters
4. Propose Unique Value Proposition
5. Elaborate channels of reaching out to the customers
6. Enlist and explain in brief the cost segment
7. Enlist and explain revenue segment
8. Sketch Lean canvas and list 7 key elements

Text Books

S.N	Title	Authors	Edition	Publisher
1	Entrepreneurial Development	Khanka S.S.	Revised	S. Chand
2	Entrepreneurship Development	Sangeeta Sharma	2nd	PHI

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Entrepreneurship Development and Small Business Enterprises	Poornima M. Charantimath	3rd	Pearson

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FIFTH SEMESTER



COURSE CODE	COURSE NAME	TH	TU	CREDITS	EVALUATION		
					CA	ESE	TOTAL
24BV502T	Employability Skills-II	3	--	3	40	60	100

COURSE OBJECTIVES	COURSE OUTCOMES
<ul style="list-style-type: none"> To introduce fundamental concepts of data structures and algorithms and enable students to understand their role in efficient problem solving. To develop the ability to design, analyze, and implement appropriate data structures and algorithms for real-world applications. 	<ul style="list-style-type: none"> Understand and apply basic concepts of data structures and algorithms, including arrays and algorithm design techniques. Implement and analyze linear data structures such as linked lists, stacks, and queues, along with various searching techniques. Analyze and compare different sorting algorithms based on time and space complexity for efficient data organization. Apply tree and graph data structures, including traversals, binary search trees, AVL trees, heaps, and spanning trees, to solve computational problems.

UNIT I: Data Structures & Algorithms	[10 HRS]
Overview, Algorithms Basics, Programming, Data Structures & Algorithm Basic Concepts, Data Structures and Types, Data Structures and Algorithms – Arrays.	
UNIT II: Linked Lists & searching techniques	[15 HRS]
Introduction to stack & Queue, Linked List basics, Doubly linked list, Circular Linked list, Stack & Queue, Searching Techniques, Linear search, Binary Search, Interpolation Search, Hash table	
UNIT III: Data Structure Sorting	[10 HRS]
Sorting Techniques, Algorithms, Bubble Sort, Insertion sort, Selection Sort, Merge Sort, Shell Sort, Quick Sort.	
UNIT IV: Graph and Tree Data Structure	[15 HRS]
Depth First Traversal, Breadth first Traversal, Tree Data Structure, Tree Traversal, Binary Search tree, AVL tree, B tree, Spanning tree, Tries, Heap.	

TEXT/ REFERENCE BOOKS

S.N	Title	Authors	Edition	Publisher
1	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein.	3rd	PHI
2.	Data structures & Algorithms made easy	Narsimha Karumanchi	1st	Career monk
3.	Data Structure & algorithms	Prof. Dippanita Mondal	1st	Everest publishing house

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FIFTH SEMESTER

COURSE CODE	COURSE NAME	TH	PR	CREDITS	EVALUATION		
					CA	ESE	TOTAL
24BV502P	Employability Skills-II Lab	--	3	3	25	25	50



COURSE OBJECTIVES	COURSE OUTCOMES
<ul style="list-style-type: none"> To introduce fundamental concepts of data structures and algorithms and enable students to understand their role in efficient problem solving. To develop the ability to design, analyze, and implement appropriate data structures and algorithms for real-world applications. 	<ul style="list-style-type: none"> Understand and apply basic concepts of data structures and algorithms, including arrays and algorithm design techniques. Implement and analyze linear data structures such as linked lists, stacks, and queues, along with various searching techniques. Analyze and compare different sorting algorithms based on time and space complexity for efficient data organization. Apply tree and graph data structures, including traversals, binary search trees, AVL trees, heaps, and spanning trees, to solve computational problems.

List of Practical :

- Write a program using data structure arrays for Insertion in an array element
 - At the beginning
 - At the end
 - At any given index of an array.
- Write a program using data structure arrays for deletion in an array element
 - At the beginning
 - At the end
- Write a function that will concatenate two circularly linked lists, producing one circularly linked list.
- Write a class that implements Bubble sorting algorithm on a set of 25 numbers.
- Write a template class for sorting method. Using this class write a test program for sorting using different datatypes.
- Implement the following Tree class member function Bool empty () const;
- Program on Tree traversal.
- Program on linear search and Binary search.

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VIRTUAL REALITY AND AUGMENTED REALITY

FIFTH SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
24VA503S	AR-VR DEVELOPER	--	--	8	8	50	100	150

Course Objectives	Course Outcomes
<ul style="list-style-type: none"> To provide foundational knowledge of Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), and Extended Reality (XR) along with their evolution and applications across various sectors. To develop skills for designing, creating, and implementing immersive VR/AR experiences using modern tools, devices, and development platforms. 	<ul style="list-style-type: none"> Understand the concepts, evolution, and differences between VR, AR, MR, and XR technologies. Analyze the applications of Virtual Reality across diverse sectors such as education, healthcare, retail, entertainment, and gaming. Design and develop VR-based learning experiences using appropriate design principles and active learning strategies. Apply practical skills in creating 360-degree content and develop VR applications using tools like Unity and Unreal Engine along with VR hardware devices.
Unit I : Introduction to Virtual Reality & Augmented reality	[10 HRS]
The History and Evolution of Virtual Reality, Innovating with Virtual Reality in the Classroom Understanding the Basics of Augmented Reality, Understanding the Basics of Virtual Reality, Understanding the Basics of Mixed Reality, Understanding the Basics of Extended Reality	
Unit II :	[10 HRS]
Virtual Reality in sectors - Education, Retail and Tourism, Virtual Reality in sectors - Healthcare, Defence and automotive, Virtual Reality in sectors - Film, Entertainment, Fashion and Gaming	
Unit III :	[10 HRS]
Virtual Reality for Active Learning, Design principles for Virtual Reality in education, Creating Virtual Reality Experiences for the Classroom.	
Unit IV :	[15 HRS]
Capturing 360-degree Video, Creating Interactive 360-degree Learning Experiences, 360-degree Video Editing, Virtual Reality Input Devices and Head-Mounted Displays, Virtual Reality Software Development Kits, Unity and Unreal Engine for Virtual Reality Development.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Learning Virtual Reality	Tony Parisi	1st Edition	O'Reilly Media
2	Augmented Reality: Principles and Practice	Dieter Schmalstieg, Tobias Hollerer	1st Edition	Addison-Wesley

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