ANNEXURE: 1 MODULE WISE COURSE CONTENT AND OUTCOME

SL.NO	MODULE NAME	MODULE CONTENT	MODULE LEARNING OUTCOME	DURATION (HRS)
1	Basics of Computer Vision with OpenCV	- Introduction to computer vision concepts - Setting up OpenCV for projects - Understanding OpenCV library structure	- Successfully install and configure OpenCV - Load, display, and save images and videos - Perform pixel-level manipulations	4 HRS
2	Image Preprocessing Techniques	- Resizing and cropping - Color space conversions (RGB, BGR, HSV) - Thresholding techniques	- Apply resizing and cropping - Convert color spaces - Demonstrate thresholding on grayscale images	4 HRS
3	Image Filtering	- Smoothing and sharpening - Edge detection (Canny, Sobel)	- Apply filters for enhancement - Perform edge detection - Compare filter results	4 HRS
4	Geometric Transformations	- Scaling, rotation, and translation techniques	- Implement scaling - Perform rotation and translation - Combine transformations	4 HRS
5	Contour Detection and Analysis	- Contour detection - Feature extraction	- Detect and draw contours - Compute shape metrics	5 HRS

		- Shape analysis	- Classify shapes	
6	Feature Detection and Matching	- Keypoint-based algorithms (SIFT, ORB, FAST) - Object recognition	- Detect features using algorithms - Match features with 80% accuracy - Build object recognition applications	5 HRS
7	Real-Time Object Detection and Tracking	- Using YOLO/SSD models - Tracking algorithms (KCF, GOTURN)	- Detect objects in live streams - Implement tracking algorithms - Test tracking under varying conditions	5 HRS
8	Image Segmentation	- Object-background separation - Algorithms (watershed, GrabCut)	- Perform segmentation using advanced methods - Evaluate segmentation accuracy - Develop workflows for segmentation	5 HRS
9	Industry Use Cases	- Prototyping for specific problems - Real-world testing	- Develop industry-specific prototypes - Test and analyze performance - Document findings	5 HRS
10	End-to-End Project	- Complete project lifecycle - Optimization and presentation	- Develop and deploy projects - Ensure 95% requirements are met - Present results and challenges	4 HRS

ANNEXURE : 2 Industry Use Cases/Final Projects

LEARNING OUTCOME	ASSESSMENT CRITERIA	PERFORMANCE CRITERIA	USECASES
Apply computer vision techniques to solve real-world problems	Demonstrate the ability to detect and classify objects in images/videos	Successfully implement real-time detection and classification algorithms with 95% accuracy in controlled and dynamic environments	Real-Time Traffic Sign Detection
Automate retail operations using computer vision	Identify and analyze inventory levels from images/videos	Build a model to detect product availability and shelf arrangement with automated notifications	Retail Shelf Inventory Monitoring
Detect industrial defects with high accuracy	Use image processing for defect detection	Develop an automated system to identify defects like scratches, cracks, or dents on manufacturing components	Industrial Defect Detection
Analyze player movements and performance metrics	Extract key sports performance metrics	Create a system to detect player positions, actions, and key metrics like speed, agility, and strategy	Sports Performance Analysis
Enhance security using facial recognition	Accurately identify individuals in real-time	Implement a facial recognition system with >95% accuracy for security monitoring and alerting	Facial Recognition System for Security
Improve diagnostics with imaging techniques	Analyze medical images for abnormalities	Design a healthcare imaging solution capable of	Healthcare Imaging Analysis

		detecting diseases or anomalies like tumors or fractures	
Recognize license plates automatically in various conditions	Automate license plate detection	Implement ALPR with the ability to detect and recognize plates across different lighting and weather conditions	Automated License Plate Recognition (ALPR)
Develop AR-based try-on applications for retail	Provide real-time virtual fitting options	Build a system to overlay clothing or accessories on users in an AR environment with seamless user interaction	Virtual Try-On for E-Commerce
Monitor wildlife using camera-based systems	Identify and track wildlife species	Deploy a system to detect and analyze wildlife activity patterns and species distribution	Wildlife Monitoring and Conservation
Integrate vision for autonomous drone systems	Build a drone capable of detecting and avoiding obstacles	Design a drone system that uses vision to detect objects, map environments, and navigate autonomously	Capstone Project – Autonomous Drone Vision System

TABLE 4: LIST OF FINAL PROJECTS	
SL.NO	**FINAL PROJECT**
1	Real-Time Traffic Sign Detection
2	Retail Shelf Inventory Monitoring
3	Industrial Defect Detection

4	Sports Performance Analysis
5	Facial Recognition System for Security
6	Healthcare Imaging Analysis
7	Automated License Plate Recognition (ALPR)
8	Virtual Try-On for E-Commerce
9	Wildlife Monitoring and Conservation
10	Capstone Project – Autonomous Drone Vision System
11	Gesture Recognition System
12	Smart Parking Detection System
13	Currency Note Authentication
14	Virtual Background Replacement
15	Augmented Reality (AR) Marker Detection
16	Real-Time Fire and Smoke Detection
17	Sign Language Translation Tool

18	Food Quality Inspection in Agriculture
19	Crowd Counting and Density Estimation
20	Underwater Object Detection for Marine Study

ANNEXURE 3 – COURSE ASSESSMENT RUBRICS

TABLE 5: COURSE ASSESSMENT RUBRICS (TOTAL MARKS: 70)				
ASSESSMENT CRITERIA	**DESCRIBE THE CRITERIA OF THE BELOW CATEGORY PERFORMANCE**			**TOTAL MARKS**
	FAIR	**GOOD**	**EXCELLENT**	
MCQ/ Programming/ Project Submission Round	Above 40	Above 55	Above 65	70

Category	Assessment Criteria	Performance Levels	Weightage (Marks)
Practical Skills Proficiency	Demonstrates ability to perform job-specific tasks effectively, using relevant tools, techniques, or methodologies (e.g., Tally for accounting, consignment tracking).	Fair, Good, Excellent	20
Technical Knowledge Application	Applies theoretical concepts to practical scenarios with accuracy and relevance (e.g., compliance with GST laws, financial planning, or logistics protocols).	Fair, Good, Excellent	15
Project Execution	Completes assigned projects or use cases demonstrating innovation, thoroughness, and skill application	Fair, Good, Excellent	25

Category	Assessment Criteria	Performance Levels	Weightage (Marks)
	relevant to industry standards.		
Communication and Reporting	Clearly presents findings, solutions, or project outcomes using professional communication and documentation standards (e.g., reports, presentations).	Fair, Good, Excellent	10