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| **COURSE CODE& TITLE** | **SEMESTER**  ◼ SPRING 🞏 FALL | **CREDIT HOURS**  TH 🞏3 ◼2 🞏1 🞏0 PR 🞏3 🞏2 ◼1 🞏0 |
| **PREREQUISITE COURSE(S)** | **DATE OF APPROVAL** | **BATCH** |
| **COURSE CONTENTS**   |  |  |  |  | | --- | --- | --- | --- | | **S. No.** | **Topic** | **Contents** | **Remarks (if any)** | |  | Overview of Computer vision and Image Processing Systems. | What Is an Image? Digital Image Definitions: Theoretical Account Image Properties Signal-to-Noise Ratio Image Bit Resolution |  | |  | Image Formation and Perception, Continuous and Digital Image Representation. | Image formation methods /algorithms/representations |  | |  | Image Quantization: | Uniform and Non- Uniform, Visual Quantization (Dithering). |  | |  | image Acquisition, Types, and File I/O | image Acquisition, Bitmap Format, PEG Format, GIF Format, TIFF Format |  | |  | Image Arithmetic | operator Basics, Pixel Addition, Pixel Subtraction ETC,  Image Subtraction/Multiplication/Division  Image Blending and Linear Combinations |  | |  | Affine and Logical Operations, Distortions,  and Noise in Images | Affine and Logical Operations, Distortions, and Noise in Images.  Distortion in images |  | |  | Image Contrast Enhancement | Linear and non-liner Stretching, Histogram Equalization. |  | |  | **MIDTERM** |  |  | |  | Image smoothing and image sharpening by spatial domain linear filtering, | Image smoothing and image sharpening by spatial domain linear filtering, |  | |  | Edge detection | Introduction, he Prewitt Operator ,the Sobel Operator, The Canny Operator |  | |  | Color representation and display | Color representation and display; true and pseudo colour image processing-I. |  | |  | Color Image Processing – II. | Color Image Processing – II. |  | |  | Image sampling | Image sampling and sampling rate conversion (resize). |  | |  | Lossless Image Compression & Loss Image Compression. | Image Compression–Decompression Steps.  Entropy Coding, JPEG Compression |  | |  | Lossless Image Compression & Loss Image Compression. | Entropy Coding, JPEG Compression |  | |  | Object Recognition. | Object Recognition techniques, machine learning, deep learning for image processing |  | |  | **Total per Semester:** |  |  | | | |
| **TEXTBOOKS (Book Name, Authors, edition, Publisher, Year)**  Recommended Books:  1.  Uvais Qidwai and C.H. Chen, Digital Image Processing: An Algorithmic  Approach with MATLAB. 2. “ Learning OpenCV 3 Computer Vision with Python Second Edition by Joe Minichino Joseph Howse | | |
| **COURSE LEARNING OUTCOME AND ITS MAPPING WITH PROGRAMME LEARNING OUTCOME**   |  |  |  |  | | --- | --- | --- | --- | | **Sr. No.** | **CLOs** | **Taxonomy level** | **Programme learning outcome (PLO)** | | At the end of the course, the student will be able to: | | | | |  |  |  |  | |  | ***Demonstrate and apply*** Demonstrate practical skills in implementing real-time image processing and computer vision systems. | **C2** | **P3** | |  | ***Select*** andapply appropriate models and technique to solve practical real life computer vision problems /issues. | **C3** | **P4** | |  | **Demonstrate and Apply** the fundamentals of solid understanding of the theory through coding and implementation of image processing and computer vision algorithms and techniques | **C3** | **P5** |   **REMARKS (if any):** | | |

**Recommended by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Approved by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(Chairperson/Date) (Dean/Date)