**Capstone Project – Introduction (PROJ2999), 7th Semester**

**Academic year: 2025-26**

**Project Title**: Medical Image Enhancement and segmentation based on conventional and deep learning algorithms

**Guide Name:** Dr Pankaj Kandhway

**Section**: Capstone Project – Introduction (PROJ2999)

**Section Coordinator Name:** Dr. Kshitij Shakya/ Dr. Pankaj Kandhway

Medical imaging plays a vital role in healthcare by enabling non-invasive diagnosis and monitoring. However, images often suffer from low contrast, noise, or artifacts that obscure anatomical structures. This project aims to improve image quality and accurately identify regions of interest using enhancement and segmentation techniques.

In the conventional approach, image processing methods such as histogram equalization, contrast stretching, and filtering enhance image quality, followed by segmentation techniques like thresholding, edge detection, and region-based methods. While computationally efficient, these methods may struggle with complex structures or low-quality images.

In the deep learning approach, convolutional neural networks (CNNs), including U-Net, perform end-to-end segmentation. These models learn hierarchical features from annotated datasets, achieving high accuracy even in challenging cases and outperforming traditional methods in precision and automation.

The project implements and compares both conventional and deep learning methods on medical imaging datasets. The project highlights the potential of combining conventional enhancement with deep learning for improved medical image analysis using both conventional and deep learning algorithms for the enhancement purpose morphological approach will be used and GLCM technique will be utilize

**Team Members (Name & Reg No.):**

1. SMD. Younus (BU22EECE0100188)
2. M. Bhanu Prakash (BU22EECE0100205)
3. M. Praveen (BU22EECE0100506)

Guide’s signature & date