🚀 Curriculum (Abstract)

- **BSc Level**: Basics of image processing, intro to machine learning, OpenCV tutorials, simple CNNs.
- **MSc Level**: Deep learning architectures, transfer learning, optimization methods, model evaluation.
- **PhD Level**: Advanced topics like GANs, vision transformers, multimodal learning, novel research directions.

🎓 Curriculum: Computer Vision with ML & DL (Comprehensive)

📘 BSc Level – Foundations

Focus: Intuition and practical basics Topics:

- Introduction to Computer Vision and image types (RGB, grayscale, etc.)
- Image manipulation with OpenCV (resize, crop, filters)
- Basic statistics and data visualization for vision datasets
- Fundamentals of supervised machine learning (linear regression, decision trees)
- Beginner CNNs: architecture and use cases Projects:
- Build a simple photo filter app
- Classify handwritten digits using MNIST

📗 MSc Level – Deepening Skills

Focus: Model architecture, evaluation, and optimization Topics:

- Advanced CNN architectures: ResNet, MobileNet, etc.
- Transfer learning and fine-tuning on custom datasets
- Object detection: YOLO, SSD, Faster R-CNN
- Semantic segmentation with U-Net
- Loss functions, metrics, and hyperparameter tuning Projects:
- Train a pet breed classifier from scratch
- Segment road lanes for autonomous driving

▉ PhD Level – Research and Innovation

Focus: Novel techniques, hybrid models, and real-world impact Topics:

- Generative models: GANs, VAEs for vision synthesis
- Vision Transformers and attention mechanisms
- Multimodal learning: combining vision with text/audio
- Ethical AI, fairness, and bias mitigation in computer vision
- Writing and publishing research in top-tier journals Projects:
- Create a synthetic image dataset using GANs
- Develop a visual question answering (VQA) system