AI and ML Syllabus Summary

Scope

The syllabus covers:

 - Python for Data Science

 - Artificial Intelligence

 - Ethics and Law in Data and Analysis

 - Computer Vision and Image Analysis

Key Units and Performance Criteria

1. **Python for Data Science**

 - Application of Python in the workplace.

 - Python basics: IDEs, text editors, lists.

 - Developing:

   - 2D/3D games

   - Web & internet applications

   - Databases, networks, and business apps.

 - Use of **Numpy** for mathematical functions.

 - Visualization with **Matplotlib**.

 - Applying mathematical concepts:

   - Equations, graphs, differentiation, optimization

   - Vectors, matrices, statistics, and probability

 - Exploring, preparing, and cleaning data.

2. **Artificial Intelligence (AI)**

 - Basics of AI in Machine Learning.

- Computer vision and bots.

- Key tasks:

  - Handwritten digit recognition

  - Forecasting time-series data using recurrent networks

  - Building LSTM-based text applications

  - Neural models for machine translation

  - Creating multimodal AI and speech recognition systems.

3. **Ethics and Law in Data and Analysis**

 - Ethical and legal frameworks for:

   - Data profession

   - Data and AI analysis

 - Dynamic programming approaches for big data and AI.

4. **Computer Vision and Image Analysis**

 - Image exploration and analysis using Python libraries.

 - Implementing image classification via machine learning and deep learning.

 - Techniques:

   - Data augmentation

   - Transfer learning

   - Convolutional Neural Networks (CNNs)

   - Object detection and semantic segmentation.

Knowledge and Understanding (KU)

 - Preparing for production processes and meetings.

 - Developer responsibilities and version control.

- Operational settings and specifications of tools.

Generic Skills (GS)

- Version control: Naming conventions, folder organization, commit best practices.

- Team management and problem-solving.

- Quality assessment and corrective action planning.