**(Weeks 1-4) Introduction and Foundations**

**Week 1: Understanding AI and Foundations**

Presentations & Quizzes will be conducted every week (Randomly)

* **Day 1**: Overview of AI (Definitions, History, Applications)
* **Day 2**: Evolution of AI in Human life and industries
* **Day 3**: Types of AI: Narrow AI vs. General AI vs. Super AI
* **Day 4**: Applications of AI in everyday life
* **Day 5**: Hands-on: Quiz and Assignment (Presentations)

**Week 2: Basic Concepts of AI and Intelligent Systems, Introduction of ML, DL, & NL**

* **Day 6:** Key AI terminology: Machine Learning, Deep Learning, Neural Networks
* **Day 7:** AI vs. Traditional Computing
* **Day 8:** Types of Machine Learning: Supervised, Unsupervised, and Reinforcement Learning
* **Day 9:** Basic Structure of Deep Learning and Neural Networks
* **Day 10:** Role of Data in AI

**Week 3: AI Tools and Technologies**

* **Day 11:** Overview of AI Software and Platforms (e.g., Python, Jupyter Notebook)
* **Day 12:** AI in Automation and Cloud Computing (Google AI, AWS AI, Microsoft AI)
* **Day 13:** Introduction to Chatbots and Virtual Assistants (ChatGPT, DeepSea, Siri, Alexa)
* **Day 14**: Setting up Python and basic programming concepts
* **Day 15**: Hands-on: Writing your first Python program and basic algorithms

**Week 4: Programming Basics for AI**

* **Day 16**: Data types, control structures, and loops in Python
* **Day 17**: Functions, modules, and libraries (NumPy, Pandas)
* **Day 18**: Data visualisation with Matplotlib and Seaborn
* **Day 19**: Hands-on: Working with datasets and basic plotting
* **Day 20**: Mini-project: Analysing a dataset

**Note:** After Completion of every month, the overall test will be conducted for assessment

**Week 5: Exploring AI Concepts**

* **Day 21**: Search algorithms (DFS, BFS)
* **Day 22**: Introduction to heuristics and optimisation (A\*, hill climbing)
* **Day 23**: Knowledge representation and reasoning
* **Day 24**: State-space representation in problem-solving
* **Day 25**: Mini-project: Implementing a search algorithm

**Week 6: Ethics and Societal Impact of AI**

* **Day 26:** AI ethics and responsible AI development
* **Day 27:** Bias, privacy, and data security in AI
* **Day 28:** The future of AI in society: Opportunities and Risks
* **Day 29:** Ethical Concerns: AI in Business, Healthcare, Education, and Finance
* **Day 30:** Hands-on: Man Vs AI (Detailed description and Presentation)

**Week 7: Fundamentals of Machine Learning**

* **Day 31**: Supervised learning: Concepts and algorithms (linear regression)
* **Day 32**: Unsupervised learning: Clustering (k-means, hierarchical)
* **Day 33**: Classification algorithms (decision trees, SVM)
* **Day 34**: Model evaluation metrics (accuracy, precision, recall, F1-score)
* **Day 35**: Hands-on: Building and evaluating basic ML models

**Week 8: Data Preprocessing and Feature Engineering**

* **Day 36**: Cleaning and transforming data
* **Day 37**: Handling missing data and outliers
* **Day 38**: Feature scaling and encoding categorical data
* **Day 39**: Feature selection and extraction techniques
* **Day 40**: Hands-on: Preparing data for ML models

**Week 9: Advanced Machine Learning**

* **Day 41**: Ensemble methods (Random Forest, Gradient Boosting)
* **Day 42**: Dimensionality reduction techniques (PCA)
* **Day 43**: Intro to time-series analysis
* **Day 44**: Regularisation techniques (L1, L2)
* **Day 45**: Hands-on: Solving a real-world ML problem

**Week 10: Capstone ML Project**

* **Days 46-50**: Group project: Design, build, and present a machine learning solution

**(Weeks 11-14) Neural Networks and Deep Learning**

**Week 11: Neural Networks Basics**

* **Day 51**: Concept of neural networks
* **Day 52**: Introduction to deep learning frameworks (TensorFlow, PyTorch)
* **Day 53**: Hands-on: Building a basic neural network

**Week 12: Convolutional Neural Networks (CNNs)**

* **Day 54**: Introduction to CNNs and their architecture
* **Day 55**: Applications of CNNs in image processing
* **Day 56**: Hands-on: Building an image classifier using CNNs
* **Day 57**: Data augmentation techniques for CNNs
* **Day 58**: Mini-project: Classifying images with a custom CNN

**Week 13: Recurrent Neural Networks (RNNs)**

* **Day 59**: Basics of RNNs and their applications
* **Day 60**: Long Short-Term Memory (LSTM) networks
* **Day 61**: Hands-on: Time-series prediction with RNNs
* **Day 62**: **Week 14: Advanced Deep Learning**
* **Day 63**: Transfer learning and pre-trained models
* **Day 64**: GANs (Generative Adversarial Networks) and applications
* **Day 65**: Explainable AI (XAI) concepts
* **Day 66**: Hands-on: Using pre-trained models for custom tasks
* **Day 67**: Mini-project: Applying deep learning to a novel problem

**(Weeks 13-20) Applications and Advanced Topics**

**Weeks 13-14: Natural Language Processing (NLP)**

* **Days 67-70**:
  + Text preprocessing, tokenisation, sentiment analysis
  + Concept of NLP
  + Hands-on: Building and deploying an NLP model

**Weeks 15-16: Reinforcement Learning and AI in Practice**

* **Days 71-80**:
  + Basics of reinforcement learning
  + Applications of AI in healthcare, finance, and education
  + Ethical considerations and bias mitigation in AI

**Weeks 17-20: Capstone Project and Final Presentation**

* **Days 81-100**:
  + Capstone project (Individual/Group):
    - Define a problem, build an AI model, test, and deploy
    - Present findings and solutions to the class