Course Name	From Data to Decision: A Comprehensive Guide to AI, MLOps, and GenAI
Course Duration	40 hours (5 Days)
Time Division	**Break:** 1 Hr. 15 Minutes /Day **Session:** 6 Hrs. 45 Minutes/Day

Important Note:

- Courseware – Reference material/ppt along with lab files/exercises will be provided
- All labs will be performed on Open Source Platform.

Topic	Content Description	Activity	Duration
1. Introduction to AI and MLOps	- Overview of AI, Machine Learning, and MLOps - Importance of AI/MLOps in Business - Difference between AI/ML and Statistical Use Cases	Group Discussion on Business Use Cases for AI vs Statistics	2 hours
2. AI/MLOps Pipeline Overview	- Overview of an AI/ML pipeline (data collection, preparation, training, deployment) - Understanding the components of MLOps	Break down a real-world use case into AI/ML pipeline steps	1.5 hours
3. Problem Framing	- Breaking down business use cases into sub-problems - Identifying features and targets/labels	Exercise: Use a business case to define features and labels	2 hours
4. Data Collection & Preparation	- Structured vs Unstructured Data - Data Collection - Data Cleaning Techniques (Pandas, NumPy) - Feature Engineering	Hands-on: Data cleaning and preparation using Pandas and NumPy	3 hours
5. Exploratory Data Analysis (EDA)	- Importance of EDA - Data Visualization Techniques (matplotlib, seaborn) - Identifying trends, patterns, outliers	Practical: Perform EDA on a dataset using matplotlib and seaborn	3 hours
6. Machine Learning Algorithms	- Overview of ML Algorithms (Supervised, Unsupervised) - Selecting the right algorithm for the business use case	Interactive: Choose the right ML algorithm for given problems	3 hours

7. Model Training & Evaluation	- Train/Test Split	Hands-on: Train and evaluate models using Scikit-learn	3 hours
	- Cross-validation		
	- Model Evaluation Metrics (Accuracy, Precision, Recall, F1 Score)		
8. Fine-tuning and Optimization	- Hyperparameter Tuning	Practical: Fine-tune a pre-trained model with hyperparameter tuning	2.5 hours
	- Regularization (L1, L2)		
	- Feature Importance		
9. Introduction to Generative AI (GenAI)	- Overview of GenAI	Practical: Implement a basic text generation model using GPT	4.5 hours
	- Key Concepts: Transformers, Attention Mechanism, GPT		
	- Applications of GenAI in NLP, Vision, and more		
10. Use Cases of GenAI	- Exploring Real-world Applications (Chatbots, Text Summarization, Image Generation)	Discussion and Analysis of GenAI in industry applications	2.5 hours
	- Integrating GenAI into Business Solutions		
11. Ethics in AI/ML & GenAI	- Ethical Challenges in AI/ML	Case Study: Analyze and discuss ethical dilemmas in AI/ML	2.5 hours
	- Fairness, Bias, and Transparency		
	- AI Governance and Legal Considerations		