**Day 1: Introduction to AI and Mathematics**

**Morning Session**

* **AI**
* Welcome and program overview.
* Introduction to AI: Definition, history, and importance.
* Types of AI: ANI, AGI, ASI.
* Scope and Career opportunities of AI.
* AI Case Studies: Healthcare, Education, Agriculture, Finance.
  + **Math Concepts**
  + Statistics & Probability: Introduction, Mean, Median, Mode, Variance, Standard deviation, Distributions, Central Limit Theorem, Baye’s Theorem.

**Afternoon Session**

* + **Python**
  + What is Python, why Python.
  + Python vs other programming languages.
  + Print statement, Variables, Operators, Conditional Statements, Looping Statements, Data Types (Numeric, Sequence, Boolean, Set, Dictionary), Data type conversions, Functions, Lambda Function, Modules, File Handling.
  + Tasks on Basic Python programming.
  + Essential Libraries.
  + Why creating own library is important?

**Day 2: Essential Python Libraries and Data Preprocessing**

**Morning Session**

* + **Python libraries for ML**
  + NumPy.
  + Pandas.
  + What is Data, Types of Data (Structured Data & Unstructured Data), Target variable & Features, Numerical & Categorical Data.
  + Matplotlib.
  + Seaborn
  + Hands-on experience with these libraries.

**Afternoon Session**

* + **Data Preprocessing**
  + Data Collection - Collecting Data from various sources, Different types of formats of Data available to us.
  + Data Preprocessing – EDA (Handling Missing Values, dealing with outliers, Handling Categorical Features, Data transformations, Feature encoding, Feature Scaling)
  + Task on EDA – Students must perform EDA on the given Dataset.

**Day 3: Machine Learning**

**Morning Session**

* + **Supervised Learning**
  + Introduction to ML: Definition, Types of ML, ML terminology.
  + ML workflow.
  + Supervised Learning – Regression (Linear Regression, Polynomial), Classification (Logistic Regression, Naïve Bayes, Decision Tree), Ensemble Techniques (Random Forest).
  + Overfitting and Underfitting.
  + Advantages and Disadvantages of each algorithm.
  + Model Evaluation.
  + Hands-on experience on these algorithms using sklearn library.

**Afternoon Session**

* + **Unsupervised learning**
  + Unsupervised Learning – Clustering (K-Means Clustering, Hierarchical Clustering)
  + Dimensionality Reduction – PCA (Principal Component Analysis), SVD (Singular Value Decomposition), Feature Selection.
  + Advantages and Disadvantages of each algorithm.
  + Hands-on experience on these algorithms using sklearn library.

**Day 4: Neural Networks**

**Morning Session**

* + **Neural Networks**
  + Introduction to NN: Definition, Types of NN, Elements of NN (Neuron, Internal Layers, Weights, Activation Functions, Hyper Parameter).
  + Essential libraries for NN (TensorFlow, Keras).
  + Practical session on Artificial Neural Networks.

**Afternoon Session**

* + **CNN and RNN**
  + Introduction to CNN & RNN.
  + Practical session on Convolutional Neural Networks.
  + Practical session on Recurrent Neural Networks.
  + Task on Image Classification.

**Day 5: Computer Vision and NLP**

**Morning Session**

* + **Computer Vision**
  + Introduction to CV
  + OpenCV library.
  + Basic operations on images using OpenCV.
  + Practical session on OpenCV.

**Afternoon Session**

* + **NLP, Reinforcement Learning**
  + Introduction to NLP.
  + Tokenization, stop words, Stemming & Lemmatization
  + Practical session on Natural Language Processing.
  + Basic understanding on Reinforcement Learning.

**Day 6: Further Overview on AI**

**Morning Session**

* + **AI**
  + Practical session on Sentimental Analysis.
  + AI Ethics.
  + Overview of Training Data & Real Data.

**Afternoon Session**

* + **Ideathon & Hackathon Instructions**
  + Ideathon Instructions
  + Hackathon Instructions.
  + Workshop Closing Remarks.

**Day 7: Ideathon**

**Morning Session**

* Registration for Ideathon
* Welcome and Introduction to Ideathon.
* Ideathon sessions.

**Afternoon Session**

* + Pitching and refining the concepts.
  + Mentorship Sessions.
  + Final Idea Presentations.

**Days 8-9: Hackathon**

* + Registration for Hackathon.
  + Welcome and Kick-off.
  + Hackathon Begins.
  + Check-ins and Mentorship Sessions