Course: Machine Learning Essentials with Python
Duration: 4 days

Day 1: Introduction to AI, Machine Learning, and Neural Networks

1. **Introduction to AI & Machine Learning**
   - Understand what AI and Machine Learning are and their importance in modern business.
   - Exploring definitions and types of AI.
   - AI in the Modern Age and its role in business.
   - Embrace Change: Learn and Build Confidence using AI tools.
2. **Deeper Dive into Machine Learning**
   - Basics of how mathematics are applied to AI.
   - Algorithms: What are they and how are they used in AI and ML.
   - Supervised vs Unsupervised learning.
   - Classification, Regression, Clustering, Dimensionality Reduction, and Ensemble Methods.
   - The role of ML in AI and business decision-making.
   - Real-world business scenarios where Machine Learning increased efficiency.
3. **Basics of Neural Networks**
   - Introduction to Neural Networks: What they are and how they are used.
   - Basic parts of Neural Networks: Neurons, activation functions, interactions.
   - Types of Neural Networks: Feedforward, Recurrent, Convolutional Neural Networks.
   - Understanding how they learn: Forward propagation, backpropagation.
   - Training Neural Networks and the importance of data preprocessing.
   - Practical applications of Deep Neural Networks (Image recognition, language processing).

Day 2: AI in Business & Decision Making, Generative AI, and GPT

4. **Leveraging AI in Business & Decision Making**
   - Key business areas where AI adds value: Operations, Marketing, Sales, HR, content development, and software development.
   - How AI is used in business decision-making.
   - Introduction to predictive analytics.
   - Using AI for strategic decision-making.
5. **Hot Trends for AI in Business: Large Language Models (LLM), Generative AI, and GPT**
   - Basics of Generative AI and how it differs from other AI techniques.
   - Introduction to GPT and its applications in various sectors.
   - How GPT uses machine learning to generate human-like text based on input.
   - Understanding language models and how they are trained using large text data.

Day 3: Neural Networks, NLP, Sentiment Analysis, and AI for AV Processing

6. **Basics of Neural Networks (Continued)**
   - Ethical considerations in Neural Networks.
   - Addressing biases and ethical concerns in AI.
7. **Natural Language Processing (NLP) & Sentiment Analysis**
   - What is NLP and its applications?
   - Language and Semantic Meaning in NLP: Bigrams, Trigrams, n-Grams, Root Stemming.
   - Introduction to Sentiment Analysis: Sentiment indicators and sampling.
   - Predicting elections based on sentiment analysis.
8. **Using AI for Image, Video, and Audio Processing**
   - AI in Image processing and identification: Facial analysis.
   - AI in audio processing.
   - Role of AI in analyzing streaming video and real-world AV processing.

Day 4: AI Technical Tools, Applications, and Future Trends

9. **AI for Business Technical Tools: Data Science, Deep Learning & The Cloud**
   - Overview of applying AI in Data Science.
   - Tools: Python, NumPy, Pandas, SciKitLearn, Hadoop, Spark.
   - Introduction to NoSQL databases.
   - Overview of Deep Learning.
   - AI for Business in the Cloud: Cloud-based AI tools and solutions.
10. **Practical Applications and the Future of AI in Business**
    - What's next in applied AI for businesses.
    - Emerging AI trends shaping the future of business.
    - Ethical considerations in implementing AI solutions.