Title: Introduction to Deep Learning

Objective: The objective of this introductory session is to provide participants with a high-level understanding of deep learning, its applications, and its core components. By the end of the session, participants should be able to explain the fundamental concepts of deep learning and recognize its potential use cases.

Duration: Approximately 90 minutes

Lesson Plan:

1. Introduction (10 minutes)
- Welcome and introduction to the session.
- Briefly explain the importance of deep learning in modern AI applications.
- Highlight some real-world examples where deep learning has been successful.

2. Basics of Neural Networks (20 minutes)
- Provide an overview of artificial neural networks.
- Explain the basic structure and components of a neural network: input layer, hidden layers, activation functions, and output layer.
- Introduce the concept of weights and biases and their role in neural networks.
- Discuss the concept of forward propagation and how neural networks make predictions.

3. Deep Learning and its Components (30 minutes)
- Define deep learning and differentiate it from traditional machine learning.
- Introduce the key components of deep learning: deep neural networks, layers, and deep learning architectures (e.g., convolutional neural networks, recurrent neural networks).
- Explain the advantages of deep learning in handling complex patterns and large-scale data.
- Discuss the role of activation functions, loss functions, and optimization algorithms in deep learning.

4. Deep Learning Applications (20 minutes)
- Explore various applications of deep learning across different domains, such as computer vision, natural language processing, speech recognition, and recommendation systems.
- Provide specific examples and success stories to highlight the impact of deep learning in these areas.
- Discuss the challenges and limitations of deep learning in real-world scenarios.

5. Getting Started with Deep Learning (10 minutes)
- Share resources and tools for getting started with deep learning (e.g., popular deep learning libraries like TensorFlow and PyTorch, online courses, tutorials, and datasets).
- Briefly explain the steps involved in a typical deep learning workflow: data preprocessing, model training, and evaluation.

6. Q&A and Wrap-up (10 minutes)
- Encourage participants to ask questions and clarify any doubts.
- Summarize the key takeaways from the session.
- Provide additional resources for further learning.
- Thank the participants for their participation and conclude the session.