Introduction to Deep Learning Concepts (30 minutes)

* **Topic:** Overview of Deep Learning and Its Impact
  + **Activities:**
    - Short presentation on the history and significance of deep learning.
    - Discuss the analogy of deep learning's impact compared to electricity.
  + **Interactive Question:** Ask, "Can anyone give an example of deep learning in everyday applications?"

Basics of Neural Networks (45 minutes)

Activity Title: "Neural Network Rope and Balloon Demonstration" (15 minutes)

* **Topic:** From Linear Regression to Logistic Regression
  + **Activities:**
    - Code demonstration in Google Colab: Implement a simple linear regression model.
    - Evolve the conversation into logistic regression, highlighting the transition from linear to logistic for binary classification.
  + **Code for Linear Regression:** Provide a snippet that defines a simple linear regression in Python, using NumPy for operations.
  + **Interactive Question:** "What do you think makes logistic regression suitable for classification tasks?"
* **Topic:** Introduction to Neural Networks
  + **Activities:**
    - Show a basic neural network architecture with a single hidden layer.
    - Discussion on activation functions: Sigmoid, Tanh, ReLU, and their importance.
  + **Interactive Demo:** Visualize activation functions in Python using Matplotlib.

Getting into Deep Neural Networks (45 minutes)

* **Topic:** Understanding Deep Neural Networks
  + **Activities:**
    - Explain the concept of deeper layers in neural networks and their ability to capture more complex patterns.
    - Illustrate forward propagation and the concept of layer-wise computation in deep networks.
  + **Interactive Demo:** Build and train a simple deep neural network using TensorFlow or PyTorch in Google Colab.
  + **Interactive Question:** "How does adding more layers to a neural network affect its ability to learn?"

Introduction to Convolutional Neural Networks (CNNs) (30 minutes)

Activity – 3 (15 minutes)

Activity Title: “To represent the layers of a Convolutional Neural Network (CNN) using puzzles, we can create a visual and tactile activity that helps understand the hierarchical structure of a CNN.”

* **Topic:** Basics of CNNs and their Application in Image Recognition
  + **Activities:**
    - Present the basic idea and architecture of CNNs.
    - Show examples of CNNs in image recognition and classification.
  + **Interactive Demo:** Quick demonstration of using a pre-trained CNN model to classify images.
  + **Interactive Question:** "Why are CNNs particularly good for image-related tasks?"

Activity – 2 (15 minutes)

Activity Title: “To represent a Deep Neural Network (DNN) for image generation and transfer learning in the context of a Rock Paper Scissors game using chart paper and printed images”

Wrap-Up and Q&A (30 minutes)

* Summarize the key points covered.
* Open floor for questions and encourage discussion about potential applications of deep learning students are interested in.