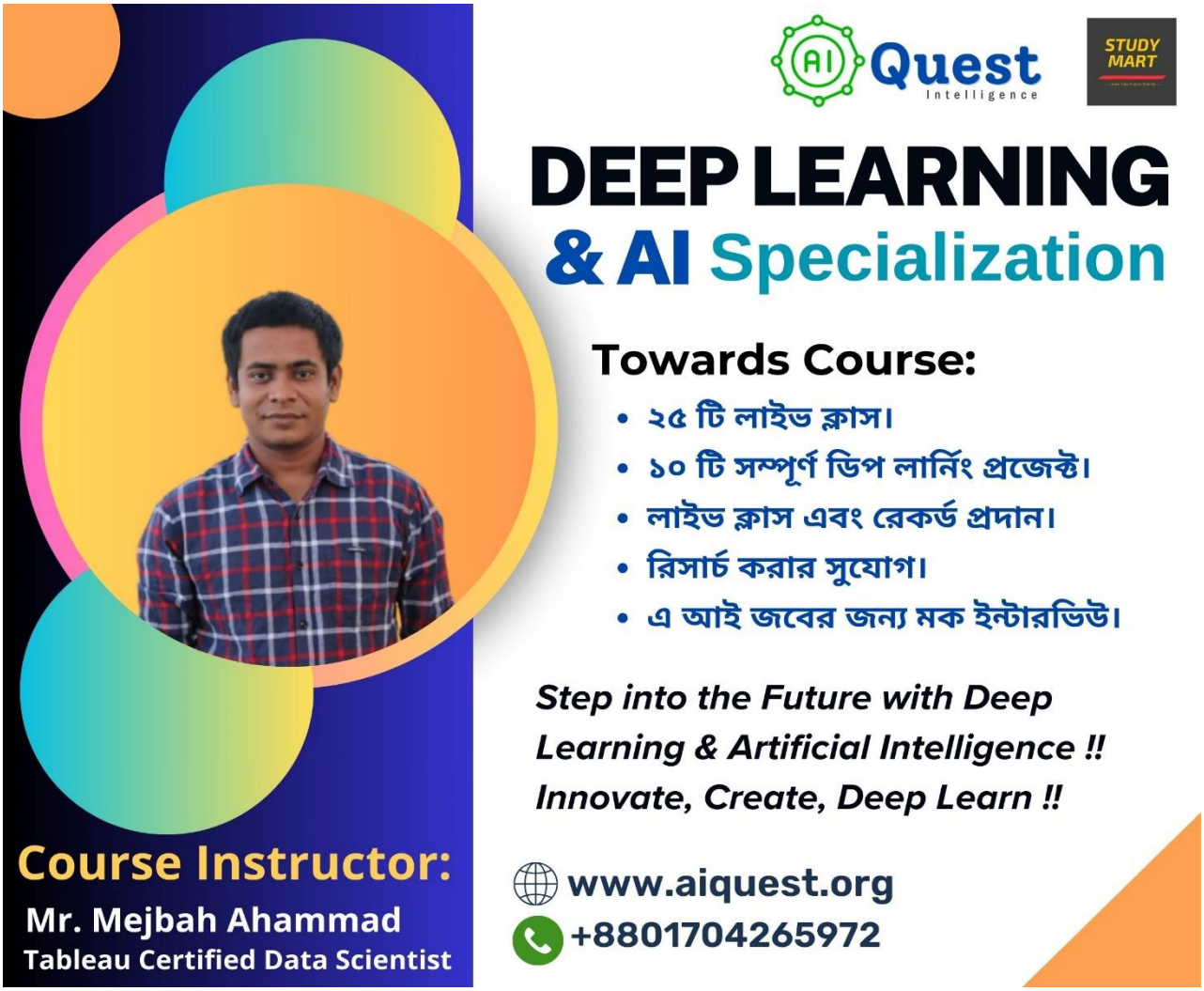
Web: www.aiquest.org

Deep Learning & AI Specialization



Watch the Demo Class on YouTube!

Course Instructor:

Mr. Mejbah Ahammad

Tableau Certified Data Scientist
M.Sc. in Computer Science at AIUB

Week 01 - 03: Introduction to Deep Learning and Convolutional Neural Networks (CNNs)

Week 1: Introduction to Deep Learning

- **Lecture 1:** Overview of Deep Learning and its Applications
- **Lecture 2:** Neural Networks and Perceptrons
- **Lecture 3:** Activation Functions
- **Assignment 1:** Implement a basic feedforward neural network from scratch
- **Quiz 1:** Deep Learning Fundamentals

Week 2: Convolutional Neural Networks (CNNs) - Part 1

- **Lecture 4:** Introduction to CNNs
- **Lecture 5:** Convolution and Pooling Layers
- **Lecture 6:** CNN Architectures (LeNet, AlexNet)
- **Assignment 2:** Build and train a basic CNN for image classification.
- **Quiz 2:** CNN Basics

Week 3: Convolutional Neural Networks (CNNs) - Part 2

- **Lecture 7:** Transfer Learning with CNNs
- **Lecture 8:** Object Detection with CNNs (YOLO, RCNN)
- **Lecture 9:** Image Generation with CNNs (GANs)
- **Assignment 3:** Implement an image generation GAN using a pre-trained CNN
- **Quiz 3:** Advanced CNN Concepts

Week 04 – 06: Recurrent Neural Networks (RNNs)

Week 04: Introduction to Recurrent Neural Networks (RNNs)

- **Lecture 10:** Introduction to RNNs
- **Lecture 11:** Vanishing and Exploding Gradients
- **Lecture 12:** Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU)
- **Assignment 4:** Build a basic RNN for time series prediction.
- **Quiz 4:** RNN Fundamentals

Week 05: Sequence Models and Applications

- **Lecture 13:** Sequence-to-Sequence Models
- **Lecture 14:** Natural Language Processing (NLP) with RNNs
- **Lecture 15:** Speech Recognition using RNNs
- **Assignment 5:** Implement a sequence-to-sequence model for machine translation
- **Quiz 5:** RNN Applications

Week 06: Advanced RNNs and Attention Mechanisms

- **Lecture 16:** Attention Mechanisms in RNNs
- **Lecture 17:** Transformer Architecture
- **Lecture 18:** BERT and Pre-trained Language Models
- **Assignment 6:** Fine-tune a pre-trained language model for a specific NLP task
- **Quiz 6:** Advanced RNN Concepts

Week 07 – 09: Large Language Models (LLMs)

Week 7: Introduction to Large Language Models (LLMs)

- **Lecture 19:** The Rise of LLMs - GPT, BERT, and others
- **Lecture 20:** How LLMs Work - Attention and Self-Attention
- **Lecture 21:** Fine-tuning LLMs for Various NLP Tasks
- **Assignment 7:** Fine-tune a pre-trained LLM for text classification.
- **Quiz 7:** LLM Basics

Week 8: Applications of LLMs

- **Lecture 22:** Text Generation with LLMs
- **Lecture 23:** Question Answering Systems with LLMs
- **Lecture 24:** Ethics and Bias in LLMs
- **Assignment 8:** Build a chatbot using an LLM
- **Quiz 8:** LLM Applications

Week 9: Advanced Topics in LLMs

- **Lecture 25:** Multimodal LLMs (combining text and images)
- **Lecture 26:** Continuous Learning and Adaptation with LLMs
- **Lecture 27:** Future Trends in LLMs
- **Assignment 9:** Implement a multimodal LLM for image captioning
- **Quiz 9:** Advanced LLM Concepts

Week 10-12: Capstone Project and Final Assessments

Week 10-11: Capstone Project

- **Project Proposal:** Students propose a deep learning project of their choice.
- **Project Development:** Guided project development with regular check-ins.
- **Mentorship:** One-on-one mentorship sessions for project support.

Week 12: Final Assessments

- **Project Presentation:** Students present their capstone projects.
- **Final Exam:** Comprehensive exam covering all course topics.
- **Quiz 10:** Course Review and Reflection
- **Assignment 10:** Reflect on your learning journey and the future of AI and deep learning.

How to Enroll in Course?

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