

IT2011 - Artificial Intelligence and Machine Learning

Department of Information Technology, Faculty of Computing

Year 2 semester 1 (2025)

Tutorial 01

Section A: Knowledge Check

Q1. Define the following terms :

- (a) Artificial Intelligence (AI)
- (b) Machine Learning (ML)
- (c) Deep Learning (DL)
- (d) Generative AI
- (e) Traditional Programming

Q2. Match the following AI branches with their applications

Branch	Application
Computer Vision	A. Detecting spam emails
NLP	B. Classifying road signs
Expert Systems	C. Medical diagnosis rules
Robotics	D. Self-navigating drone
Supervised Learning	E. Movie recommendation system

Q3. State whether the following statements are True or False :

- (a) Traditional programming involves learning from data.
- (b) Reinforcement learning works without any feedback.
- (c) CNNs are good for text classification.
- (d) GANs can generate realistic images.
- (e) RNNs are used for sequential data.

Section B: Short Answer Questions

Q4. Briefly explain the key difference between Traditional Programming and AI/ML-based systems.

Q5. Explain the terms 'Labeled Data' and 'Unlabeled Data' with suitable examples.

Q6. Describe the role of Convolutional Neural Networks (CNNs) in AI. Include one practical use case.

Q7. What is Prompt Engineering? Why is it important in Generative AI tools like ChatGPT or GEMINI?

Q8. Fill in the blanks with suitable AI/ML terms:

- (a) _____ is a reward-based learning model used in games and robotics.
- (b) _____ is a model that adds noise to data and learns to reverse it.
- (c) _____ is a subfield of AI that simulates human brain layers.
- (d) _____ processes all inputs in parallel using self-attention.

Section C: Diagram and Interpretation

Q9. Complete the diagram below using correct labels :

Input Data → _____ → Learning Algorithm → _____
→ Predictions

Q10. Identify the main components of the AI/ML lifecycle. Sketch a simplified version and explain each step in 1-2 sentences.

Section D: Application-Based Activity

Q11. A bank wants to detect fraudulent transactions.

- (a) Which machine learning type should they use? Justify.
- (b) What kind of input features might the model learn from? List at least 3.
- (c) Suggest one deep learning model that can help if the dataset has a time sequence.
- (d) How can prompt engineering help create a sample email for bank customers using AI?

Section E: Mini Case Study

Q12. Imagine a startup is building a smart personal assistant like Alexa. Based on what you learned:

- (a) What branches of AI would be involved in such a system?
- (b) How could generative AI add value to this assistant?
- (c) Explain one ethical concern when using generative AI tools.