Prompt Engineering

Date – 30 June 2025 **Day - 1**

What is Prompt Engineering?

Prompt engineering is the art of designing and refining input prompts that guide AI models and help them generate useful output. Essentially, it's what you "say" to an AI model and how you say it. A good prompt sets up the context, tone, and specificity of the response. It helps the AI generate content that aligns with the user's needs. This is an incredibly powerful tool at your disposal for tasks such as:

- Creating advertising campaigns
- Generating code samples for tutorials
- Doing research for a trip
- Learning new skills
- Practicing creative writing

Key Elements of a Good Prompt

1.Clarity and Specificity : A clear and specific prompt helps the AI understand exactly what is expected.

Example: Instead of: "Tell me about AI"

Use: "Explain how reinforcement learning works, particularly within the context of game-playing artificial intelligence, such as AlphaGo. Explain the main concepts—the reward, states, actions, and policies—with an illustration."

2. Context : Adding context improves the relevance and accuracy of the output.

Example: "Write an outline for an introductory article on Machine Learning for beginners focused on practical applications."

3. Constraints : Imposing constraints like word limits or tone refines the output.

Example: "Summarize the key points of the following article in 200 words.

Types of Prompts

1.Instructional Prompt- Used to ask for step-by-step instructions.

- **Examples:** Explain how to push a project to GitHub using VS Code.
- Give steps to install MySQL on Windows.

2.Role-based Prompt- Used to assign a specific role to the AI.

- **Examples:** Act like a computer science teacher and explain recursion.
- You are a doctor. Explain the causes of cervicitis in non-sexually active women.

3. Zero-Shot Prompt- Task is given without any examples.

4. Few-Shot Prompt- Task is given with a few examples.

5. Chain-of-Thought Prompt- Encourages the AI to reason step-by-step.

- **Example:** If a train travels at 60 km/h for 3 hours, how far does it travel? Let's think step by step.

6. Constraint-Based Prompt- Instructs the AI to follow rules/limits in output.

- **Example:** Explain the OSI model in exactly 50 words.

7. Reframe Prompt- Restating the prompt to make it clearer or more specific.

- **Example:** Explain different types of trees in data structures (like binary, AVL, and B-trees) with use cases and diagrams.

Good and Bad prompts Example –

Bad prompt	Good Prompt	Type
1."Tell me something about computers".	Assume you are a computer science professor. Explain computers to first year students in 100 words.	Instructional and Role based prompt.
2."Why?"	Suppose you are a digital marketing expert. Explain why digital marketing is important in today's world, specifically for CSE students.	Role based prompt and explanatory prompt.
3.Summarize it.	Suppose you are a teacher. Summarise the story of "The fox and the grapes" in 100 words.	Role based and Instructional prompt.
4.Give me ideas.	Suppose you are an AI developer. Give me project ideas on AI.	Role based and Request based prompt.
5."Draw something".	Act like a software architect. Explain and draw the common types of S/W architecture diagrams such as client server etc.	Role based and Instructional \prompt.