**National University of Computer & Emerging Sciences – NUCES – Karachi**

# Introduction to Information & Communication Technologies
## CL-1000
## Lab 12
### Basic Prompt Engineering

# Prompt Engineering Basics

Prompt Engineering is the art of crafting effective inputs to guide AI models like ChatGPT to produce desired outputs. This document covers the fundamentals of prompt engineering with visuals to illustrate each concept.



## 1. Clarity and Specificity

Be clear and specific in your prompts to ensure the AI understands what you're asking for. Avoid ambiguous or vague instructions and define expectations explicitly.

Example:
- Vague: 'Tell me about Python.'
- Specific: 'Provide a brief introduction to Python programming, focusing on its most popular features and use cases.'

## 2. Instructions and Context

Provide clear instructions and context to help the AI understand the task. Context can include background information, the tone of response, or the format required.

## 3. Formatting Expectations

If you expect a response in a specific format, mention it clearly in the prompt. This helps in generating outputs that fit the desired structure.

Example:
- 'List three advantages of cloud computing in bullet points.'
- 'Write a step-by-step tutorial for setting up a local server using Node.js.'

## 4. Iterative Refinement

Iterative refinement means adjusting and improving your prompt if the first result isn't as expected. Experiment with variations to refine the output.

Example:
- Initial Prompt: 'Explain machine learning.'
- Refined Prompt: 'Summarize the difference between supervised and unsupervised learning in machine learning.'

## 5. Using Constraints When Needed

Applying constraints can limit the response length, focus on specific details, or adjust the style. It guides the AI in delivering concise and relevant information.

Example:
- 'In 100 words or fewer, explain how blockchain technology works.'

## 6. Providing Examples to Guide the AI

Giving examples of the expected response format can improve the output. Sample responses help the AI understand the desired structure and tone.

## 7. Role-Playing

Assigning a role to the AI can help guide the response style or content focus. This can be useful for technical, creative, or formal contexts.

Example:
- 'Act as a professional software developer and explain the benefits of using Git for version control.'

## 8. Open-Ended vs. Closed Questions

Use open-ended questions for longer, more detailed answers and closed questions for short, specific responses.

Examples:
- Open-Ended: 'What are the benefits of a healthy diet?'
- Closed: 'Is Python a programming language?'