# 20-Day Prompt Engineering Mastery Course (With ML & Data Focus)

This course is designed to help you master prompt engineering step-by-step in 20 days. Each day focuses on one topic with deep learning, smart tasks, and practical examples. Whether you're a beginner or advancing toward AI-powered ML/data workflows, this is your complete roadmap.

# Day 1: What is Prompt Engineering?

**Goal:** Understand what prompt engineering is and why it's powerful.

### Swhat You'll Learn:

- Prompt = Instructions + Context + Format
- What makes a bad vs great prompt
- How AI interprets human instructions

#### Mind Map:

Prompt = Brick (instructions) + Cement (context) + Paint (format)

#### **Smart Tasks:**

- "Summarize the Ramayana in 3 lines"
- "Write a Python script to print even numbers"

**Notebook Idea:** Prompt anatomy basics + examples

# Day 2: Prompt Structure & Few-shot Prompting

**Goal:** Learn prompt formats: zero-shot, one-shot, few-shot

# 🫼 What You'll Learn:

- · Zero-shot vs one-shot vs few-shot prompting
- Why examples improve quality

# Mind Map:

Zero = No example | One = One sample | Few = 2-3 samples → Better control

### **Smart Tasks:**

• Compare "Write a tweet about AI" vs with 3 examples

**Notebook Idea:** Few-shot design + results comparison

# Day 3: Goal-Oriented Prompting

**@Goal:** Learn to write prompts with clear tasks

# Nhat You'll Learn:

- Designing prompts for code, writing, analysis
- Open vs closed tasks
- Tone, style, format awareness

### Mind Map:

Task → Format → Style → Tone → Output

#### **Smart Tasks:**

• Rewrite a vague prompt into a specific instruction

Notebook Idea: Prompt roleplay (teacher, coder, marketer)

# Day 4: Prompting Patterns (CoT, ReAct, Self-Ask)

**©Goal:** Use advanced prompting frameworks

# Nhat You'll Learn:

- Chain of Thought (CoT)
- ReAct (Reason + Act)
- Self-ask, self-reflection

### Mind Map:

Chain of Thought = Like teaching yourself out loud

#### **Smart Tasks:**

• Solve "How many days in 3 leap years?" using CoT

Notebook Idea: Reasoning prompt templates

# 🕰 Day 5: Contextual Prompting & Roleplaying

**©Goal:** Learn prompt memory, instruction, and role

# 🫼What You'll Learn:

- Using structured context (e.g., examples, memory)
- "Act as..." prompts

### Mind Map:

📷 Role + Goal + Context = Magic Prompt

### **Smart Tasks:**

• Prompt AI to act as CEO, Designer, Lawyer, etc.

Notebook Idea: Role-based prompt use cases

# Day 6: Prompt Refinement Techniques

**Goal:** Learn how to optimize and iterate on prompts

# 🫼What You'll Learn:

- Long → Short conversion
- · Error fixing and re-prompting

# Mind Map:



🍑 Write → Clean → Rerun → Compare

### **Smart Tasks:**

• Take a long prompt and rewrite it 3 better ways

Notebook Idea: Prompt debugging diary

# **△**Day 7: Visual Prompting (Midjourney, DALL·E)

**Goal:** Design image prompts with style, mood, composition

# Nhat You'll Learn:

• Visual prompt tokens: lighting, camera, artist, angle

### Mind Map:

Subject + Style + Mood + Angle + Format

### **Smart Tasks:**

• Create 3 prompts for "a futuristic Indian city" in different styles

Notebook Idea: Visual prompt gallery

# 🕰 Day 8: Chained Prompting

**©Goal:** Build multi-step workflows using multiple prompts

# Nhat You'll Learn:

- Output of one prompt → input of another
- LangChain, Flowise (intro only)

# Mind Map:

Step → Prompt → Result → Next Prompt

#### **Smart Tasks:**

• Summarize article → Write image prompt → Generate image

Notebook Idea: Chained use case builder

# Day 9: Tool-Specific Prompting

**@Goal:** Adapt prompts to GPT, Claude, Gemini, Mistral, etc.

## **S**What You'll Learn:

- Prompt behavior differences
- Temperature, Top-p effect

# Mind Map:

```
Model = Personality | Tune the Mood (Temp)
```

### **Smart Tasks:**

• Run same prompt in ChatGPT vs Claude and compare

Notebook Idea: Prompt testing lab

# Day 10: Coding & Python Prompting

**Goal:** Use AI to write, debug, and explain code

### Nhat You'll Learn:

- Python prompt structure
- Format → Goal → Constraints

### Mind Map:

√ Input → Format → Output → Improve

#### **Smart Tasks:**

• Prompt to build a scraper or plot generator

Notebook Idea: Coding prompt library

# Day 11: SQL + Data Prompting

**©Goal:** Use prompts to write queries, analyze tables

# 🛼What You'll Learn:

- Add table schema to prompts
- · Grouping, filtering, JOINs with LLM

### Mind Map:

Prompt = Schema + Query Goal + Constraints

### **Smart Tasks:**

• Prompt: "Get top 5 products by sales from sample table"

Notebook Idea: Data prompt templates

# Day 12: SEO + Content Prompting

**@Goal:** Automate writing for blog, product, marketing

# **S**What You'll Learn:

- SEO titles, meta description
- Templates for YouTube scripts, tweets, captions

### Mind Map:

Hook → Body → CTA → SEO

### **Smart Tasks:**

• Generate SEO article + titles for "Top AI Tools"

Notebook Idea: Content prompt vault

# Day 13: Ethical Prompting & Guardrails

**Goal:** Avoid hallucinations, bias, toxic output

### Nhat You'll Learn:

- Add constraints and disclaimers
- Use neutral, inclusive language

### Mind Map:

Prompt = Safe + Accurate + Neutral

#### **Smart Tasks:**

• Rewrite 2 biased prompts into inclusive ones

Notebook Idea: Prompt safety checklist

# Day 14: Smart Prompt Projects

**©Goal:** Apply prompts to build real use cases

## 🫼 What You'll Learn:

• Resume reviewer, YouTube idea assistant, FAQ generator

#### **Smart Tasks:**

• Build a resume evaluator using role + critique prompts

Notebook Idea: Mini-project prompt apps

# 🕰 Day 15: Prompt Portfolio Creation

**©Goal:** Build a Notion or GitHub prompt portfolio

# Nhat You'll Learn:

• Track: Prompt  $\rightarrow$  Goal  $\rightarrow$  Response  $\rightarrow$  Feedback  $\rightarrow$  Version

### **Smart Tasks:**

• Document 5 best prompts with results

Notebook Idea: "My Prompt Library"

# 🕰 Day 16: Prompting for Data Cleaning & EDA

**Goal:** Use LLM to clean data and do exploration

#### **S**What You'll Learn:

- · Handling nulls, dropping columns
- Auto generate pandas/plot code

#### **Smart Tasks:**

• "Drop columns with >50% nulls + plot histograms"

Notebook Idea: EDA assistant promptbook

# Day 17: Prompting for Feature Engineering

**©Goal:** Automate encoding, scaling, selection

## 🫼 What You'll Learn:

- SMOTE, label encoding
- Feature ranking + transformation

#### **Smart Tasks:**

• "Create new features to improve loan classification accuracy"

Notebook Idea: Feature engineering prompt lab

# Day 18: Prompting for Modeling & Evaluation

@Goal: Generate end-to-end ML pipelines

### Nhat You'll Learn:

- · sklearn, XGBoost prompt formats
- Train → Validate → Evaluate

#### **Smart Tasks:**

• "Train a DecisionTreeClassifier with cross-validation and confusion matrix"

Notebook Idea: Auto-ML Prompt Notebook

# Day 19: Advanced Prompting for ML & Data Science

**© Goal:** Master deeply technical prompt workflows to automate and optimize your ML and analytics workflows

### **S**What You'll Learn:

- Prompt for AutoML tools (H2O, Google AutoML, PyCaret via LLMs)
- Advanced data workflow generation (cleaning → tuning → explainability)
- SHAP explainability, feature selection prompts
- Prompt-based pipeline generation with testing and docstrings

### Mind Map:

```
Prompt Cycle:
Data Load → Clean → Engineer → Model → Tune → Explain → Visualize → Report
```

#### **Smart Tasks:**

- "Build a reusable PyCaret pipeline with SHAP analysis"
- "Plot top 3 features based on correlation"
- "Explain XGBoost output to a non-technical manager"

Notebook Idea: AI Assistant for ML Workflow

# Day 20: Pro-Level Prompt Engineering (Future-Proof)

**©Goal:** Learn elite techniques that top prompt engineers use

# Nhat You'll Learn:

- Meta-prompting (AI creates prompts)
- Token optimization, few-shot compression
- Self-reflection & self-debugging prompts
- Multi-agent prompt systems
- Future tools: LangGraph, DSPy, RAG, semantic memory

### Mind Map:

```
Pro Prompting = Meta + Memory + Multi-agent + Debug + Compression + Future
```

#### **Smart Tasks:**

- "Create 5 optimized prompts for time-series forecasting"
- "Build a 3-agent system (Coder, Reviewer, Enhancer)"

Notebook Idea: Prompt Wizardry Toolkit

**End of Course** – You are now a Prompt Engineering Pro!