# 📘 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.

📘 **What 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

📘 **What 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

📘 **What 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

📘 **What 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

📘 **What 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.

📘 **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

📘 **What 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

📘 **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

📘 **What 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

📘 **What You’ll Learn:**

* Track: Prompt → Goal → Response → Feedback → 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

📘 **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

📘 **What 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

📘 **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

📘 **What 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! 🎓