MERCURY

Prompt Engineering Fundamentals for AI Systems

6 – 10 December 2026
Doha (Qatar)



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Prompt Engineering Fundamentals for AI Systems

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Introduction

This Prompt Engineering Fundamentals for AI Systems course provides a foundation in prompt engineering for AI systems, focusing on designing, refining, and optimizing inputs for generative AI models. It introduces learners to the principles of communicating effectively with large language models to achieve accurate, relevant, and high-quality outputs. Participants will explore how different prompting strategies influence AI behavior and decision patterns across various applications. The program explains how prompt design impacts performance in AI-driven tools, chatbots, and automation systems. Learners will gain insight into practical techniques used in modern AI prompting workflows. Participants will understand how to bridge human intent with machine interpretation through precise prompt construction.

Targeted Groups

This Prompt Engineering Fundamentals for AI Systems training targets professionals seeking knowledge and skills:

- AI beginners exploring generative AI and prompt engineering concepts.
- Data analysts aiming to enhance AI-assisted insights and workflows.
- Content creators are using AI writing and automation tools.
- Software developers are integrating AI models into applications.
- Digital marketers are optimizing AI-driven content generation.
- Business professionals leveraging AI for decision support systems.
- Educators applying AI tools for learning design and instruction.
- Tech enthusiasts interested in large language models and AI systems.

Course Objectives

Participants will achieve the following objectives by completing the Prompt Engineering Fundamentals for AI Systems course:

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- Understand the core principles of prompt engineering and its role in generative AI and large language models.
- Develop the ability to design clear, structured, and effective prompts for diverse AI systems.
- Analyze how variations in prompt structure influence AI-generated outputs and model behavior.
- Apply advanced prompting techniques to improve accuracy, relevance, and contextual alignment of responses.
- Build practical skills in optimizing prompts for AI chatbots, content tools, and automation platforms.
- Evaluate and refine prompts to enhance performance in real-world AI applications.
- Strengthen decision-making in selecting appropriate prompting strategies for different tasks.
- Gain confidence in using AI systems for productivity, creativity, and analytical tasks across professional environments.

Targeted Competencies

Participants will gain the following competencies during the Prompt Engineering Fundamentals for AI Systems program:

- Ability to construct precise and effective prompts for AI systems and generative models.
- Skill in applying structured prompting methods for improved response accuracy.
- Analyze AI outputs and identify opportunities to optimize prompts.
- Understand contextual framing techniques for better AI interpretation.
- Capability to design prompts for chatbots, content generation, and business automation.
- Proficiency in iterative prompt refinement to enhance output quality.
- Knowledge of integrating prompt engineering into digital workflows and AI tools.
- Awareness of ethical and responsible use of AI prompting techniques in professional settings.

Studying Scenarios

In this Prompt Engineering Fundamentals for AI Systems training, participants develop skills through the following scenarios:

- Designing prompts for AI chatbots to handle customer inquiries with clarity and contextual relevance.
- Creating structured prompts for generating marketing content and business reports using generative AI tools.
- Optimizing prompts to improve data analysis outputs and decision-support recommendations.
- Testing different prompt variations to evaluate changes in AI model responses and accuracy.
- Developing real-world AI workflows where prompt engineering enhances productivity and automation outcomes.

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Course Content

Unit 1: Foundations of Prompt Engineering and AI Systems

- Introduction to prompt engineering fundamentals for AI systems and generative AI concepts.
- Understanding large language models and how they interpret user prompts.
- Overview of AI prompting techniques and their role in modern AI applications.
- Relationship between input design and output quality in AI systems.
- Key components of effective prompts include clarity, context, and structure.
- Role of natural language processing in shaping AI responses.
- Evolution of AI chatbots and prompt-based interaction systems.
- Common challenges in AI prompting and model interpretation limitations.
- Importance of iterative improvement in prompt design processes.

Unit 2: Structuring Effective Prompts for AI Performance

- Principles of writing clear and goal-oriented prompts for AI systems.
- Techniques for defining context and constraints within prompts.
- Structuring multi-step prompts for complex AI tasks.
- Using role-based prompting to guide AI behavior and tone.
- Enhancing output precision through explicit instructions.
- Avoiding ambiguity in prompt design for consistent results.
- Applying formatting strategies for structured AI responses.
- Developing prompts for different AI-driven platforms and tools.
- Optimizing prompts for improved generative AI performance.

Unit 3: Advanced Prompt Engineering Techniques

- Chain-of-thought prompting to enhance logical reasoning in AI outputs.
- Few-shot and zero-shot prompting approaches for model guidance.
- Context expansion techniques for improving AI comprehension.
- Refinement loops for iterative prompt optimization.
- Conditional prompting for scenario-based AI responses.
- Techniques for controlling tone, style, and creativity in outputs.
- Designing prompts for analytical and problem-solving tasks.
- Leveraging AI feedback loops for continuous improvement.
- Advanced strategies in prompt engineering fundamentals for AI systems.

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Unit 4: Prompt Optimization for Real-World Applications

- Applying prompt engineering in business intelligence workflows.
- Designing prompts for content generation and SEO-driven outputs.
- Using AI systems for data summarization and reporting tasks.
- Optimizing prompts for AI chatbots in customer service environments.
- Enhancing productivity through AI-assisted automation prompts.
- Building domain-specific prompts for industry applications.
- Evaluating AI responses for quality, accuracy, and relevance.
- Aligning prompts with organizational goals and user intent.
- Integrating prompt engineering into daily operational processes.

Unit 5: Practical Implementation and AI Workflow Design

- Designing end-to-end AI workflows using structured prompting strategies.
- Combining multiple prompts for complex task automation.
- Implementing prompt libraries for organizational AI use.
- Testing and benchmarking AI outputs for consistency and reliability.
- Adapting prompts for different AI models and platforms.
- Managing prompt versions for continuous improvement cycles.
- Integrating AI prompting techniques into digital transformation strategies.
- Real-world applications of generative AI in business and analytics.
- Future trends in prompt engineering and AI system development.

Final Insights & Key Takeaways

Prompt engineering fundamentals for AI systems form the backbone of effective interaction with generative AI technologies. Mastering structured and advanced prompting techniques enables consistent, accurate, and high-value AI-driven outcomes across professional domains.