

Advanced Prompt Engineering & Evaluation

Course ISI-1618 2 Days Instructor-led, Hands on

Course Description

This comprehensive two-day course takes participants beyond basic prompting to master advanced techniques for enterprise AI deployment. Students will learn to create robust, reusable prompt templates with built-in guardrails, design retrieval-aware systems that ground AI responses in enterprise content and implement structured outputs for downstream automation. The course emphasizes practical evaluation methodologies and operational considerations for scaling AI solutions across organizations.

Participants will gain hands-on experience designing prompt patterns that scale, implementing enterprise grounding with retrieval-augmented generation (RAG), creating structured outputs for automation, establishing quality frameworks with systematic evaluation, and deploying operational prompt systems with versioning and monitoring. Through five progressive hands-on labs, students will build a complete prompt operations toolkit ready for production deployment.

Who Should Attend?

This course is designed for power users of AI platforms, product and operations leads, solution owners and architects, business analysts working with AI tools, and technical leads implementing AI solutions. Students should have experience working in enterprise environments with an understanding of organizational policies, procedures, and governance requirements

Course Objectives

In this course, you will learn how to:

- Design advanced prompt patterns using role/task/style frameworks, few-shot learning, and constrained outputs.
- Implement enterprise grounding by designing RAG-optimized prompts with citation, chunking strategies, and context window optimization.
- Build automation-ready systems using JSON schema design, tool-calling patterns, and structured output validation.
- Establish quality frameworks through evaluation rubric creation, golden dataset construction, and A/B testing methodologies.
- Deploy operational prompt systems with versioning, telemetry, monitoring, and comprehensive enablement materials.

Contact ISInc for more information at 916.920.1700 or by visiting our website at <http://www.isinc.com>

Topics

- Structured prompt architecture and compound prompt design patterns
- Safe reasoning techniques and guardrail implementation
- RAG (Retrieval-Augmented Generation) prompt design and optimization
- Context window management and chunking methodologies
- JSON schema design for structured AI outputs
- Functions and tool-calling integration patterns
- Evaluation framework design and golden dataset construction
- Batch evaluation processes and A/B testing methodologies
- Prompt versioning and lifecycle management
- Telemetry, monitoring, and performance tracking for production systems

Prerequisites

Prior to attending, students should have:

- Basic GenAI familiarity and experience with AI platforms (Microsoft 365 Copilot, Amazon Bedrock, Azure OpenAI, or similar)
- Understanding of enterprise content management concepts and access patterns
- Familiarity with JSON structure and basic API concepts (helpful but not required)
- Experience working in organizational settings with policies and governance
- Modern web browser with internet access
- Access to at least one enterprise AI platform (Microsoft 365 Copilot, Amazon Bedrock, Azure OpenAI Studio, or similar)

Course Outline

Module 1: Patterns that Scale

- Evolution from Free-Form to Structured Prompts
 - Compound prompt architecture and design patterns
 - Safe reasoning techniques and guardrail implementation
- Role/Task/Style Pattern Mastery
 - Few-shot learning optimization
 - Constrained output design
- Hands-On Lab 1: Convert Free-Form Prompts into Robust Templates
 - Analyze problematic free-form prompts
 - Apply structured template patterns
 - Implement safety guardrails
 - Test template effectiveness across scenarios

Module 2: Grounding & Context Windows

- RAG (Retrieval-Augmented Generation) Prompt Design
 - Citation and source attribution patterns
 - Context window optimization strategies
- Content Management for AI Systems
 - Chunking methodologies for different content types
 - Handling conflicting or incomplete information
 - Enterprise content governance in AI systems
- Hands-On Lab 2: Author Retrieval-Aware Prompts for a Policy Corpus
 - Design RAG-optimized prompts
 - Implement citation and attribution systems
 - Create chunking strategies for policy documents
 - Test retrieval accuracy and relevance

Module 3: Tool Use & Structured Outputs

- Functions and Actions Integration Patterns
 - JSON schema design for AI outputs
 - Structured output validation and constraints
- Tool-Calling Prompt Architecture
 - Error handling and fallback strategies
 - Downstream automation considerations
- Hands-On Lab 3: Design a Schema-Constrained Prompt for Downstream Automation
 - Create JSON schemas for business processes
 - Design tool-calling prompt templates
 - Implement validation and error handling
 - Build end-to-end automation workflows

Module 4: Quality & Evaluation

- Evaluation Framework Design
 - Rubric creation for systematic assessment
 - Golden dataset construction and management
- Testing Methodologies
 - Batch evaluation processes and automation
 - A/B testing methodologies for prompts
 - Statistical significance and confidence intervals
- Hands-On Lab 4: Create a Mini Eval Set; Score Prompts and Select a Winner
 - Build comprehensive evaluation rubrics
 - Create diverse golden test datasets
 - Implement batch evaluation processes
 - Conduct A/B tests with statistical analysis

Module 5: Prompt Ops - Production Deployment

- Prompt Lifecycle Management
 - Versioning and change management
 - A/B testing frameworks and feature flags
- Monitoring and Performance
 - Telemetry and performance tracking
 - Documentation and enablement strategies
 - Security and compliance considerations
- Hands-On Lab 5 - Capstone Project: Ship an Internal Prompt Pack
 - Design complete prompt package architecture
 - Implement versioning and A/B testing systems
 - Create comprehensive telemetry and monitoring
 - Develop user documentation and enablement materials
 - Present production-ready solution