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Designing Reliable AI Workflows & Interactions

Course #: AI-201 **Duration:** 2 days

Prerequisites

Completion of AI Foundations & Risk for IT Professionals or equivalent experience evaluating AI behavior and risk in enterprise environments.

Details

This course focuses on how to design AI-enabled workflows that are reliable, controllable, and maintainable in real organizational environments. Participants learn how AI interactions, prompts, validation steps, and human oversight combine to form complete workflows rather than isolated AI requests.

Emphasis is placed on reducing variability, containing failure modes, and designing systems that degrade safely. Rather than writing code, participants learn architectural and interaction patterns that prepare them for agentic systems and hands-on implementation.

After attending this course, students should be able to:

Design multi-step AI workflows that produce consistent outcomes
Apply validation, verification, and guardrail strategies to AI outputs
Integrate human-in-the-loop checkpoints appropriately
Manage state, context, and interaction boundaries in AI workflows
Reduce error propagation and overreliance in AI-enabled systems

This course is designed for IT professionals responsible for designing, integrating, or overseeing AI-enabled workflows, including solution designers, architects, and technical leaders. This course is technical in orientation but does not require prior AI system implementation experience.

Software Needed

A laptop or desktop computer with a modern web browser and reliable internet access is recommended for accessing course materials and participating in discussions. No programming tools or AI software access is required.

Outline

Designing Reliable AI Workflows & Interactions

- **From AI Requests to AI Workflows**
  - Why single prompts fail in real systems
  - The difference between ad-hoc AI use and workflow design
  - Reliability, repeatability, and controllability
  - Characteristics of production-ready AI workflows
- **Designing Inputs for Reliable AI Behavior**

    - Prompt design as system input design
    - Structuring context, constraints, and expectations
    - Managing ambiguity and implicit assumptions
    - Controlling scope and task boundaries
- **Multi-Step AI Workflow Patterns**
    - Breaking complex tasks into discrete steps
    - Sequencing AI interactions
    - Passing outputs safely between steps
    - Managing intermediate results
- **Validation and Verification Strategies**
    - Identifying what must be validated
    - Human vs automated validation approaches
    - Detecting hallucinations and incomplete outputs
    - Designing workflows that require confirmation
- **Human-in-the-Loop Design**
    - When human oversight is required
    - Designing effective review checkpoints
    - Balancing automation and control
    - Avoiding reviewer fatigue and bottlenecks
- **Managing State, Context, and Memory**
    - Short-term vs long-term context
    - Preventing context drift
    - Handling incomplete or conflicting information
    - Reset and recovery strategies
- **Error Handling and Recovery**
    - Anticipating common failure modes
    - Designing fallback behaviors
    - Graceful degradation vs hard failure
    - Logging, transparency, and traceability
- **Workflow Boundaries and Safety Controls**
    - Limiting AI authority and scope
    - Preventing unintended actions
    - Containing blast radius of failures
    - Aligning workflows with governance requirements
- **Evaluating Workflow Reliability**
    - Stress-testing AI workflows
    - Measuring consistency and quality
    - Identifying hidden failure points
    - Continuous improvement strategies
- **Preparing for Agentic and Tool-Using Systems**
    - Transitioning from workflows to agents
    - What changes when AI can act
    - Why protocols and structure become essential
    - Preparing for MCP-based implementation
- **Summary and Next Steps**
    - Key workflow design principles
    - Applying patterns to real organizational processes
    - Readiness checklist for implementation
    - Transitioning to AI architecture and agentic systems