



AI Foundations Course Plan

This comprehensive course explores artificial intelligence from its historical origins to modern applications and ethical dimensions. Students will examine AI's evolution, understand core characteristics and learning approaches, analyze real-world implementations across industries, and address critical considerations including bias, privacy, and societal impact. Through practical activities and case studies, students will develop the skills to evaluate AI systems critically and understand their transformative potential across diverse domains.

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Course Overview

Target Audience: Professionals, students, and practitioners seeking to understand AI fundamentals and gain hands-on experience with generative AI tools

Course Objectives:

- Understand the historical development, current capabilities, and future potential of artificial intelligence
- Identify practical use cases and appropriate tools for AI implementation across various domains
- Master fundamental prompt engineering and AI interaction techniques
- Gain hands-on experience with multi-modal generative AI workflows
- Develop skills in evaluating and improving AI outputs across different data types
- Understand responsible AI practices and ethical considerations

Chapter 1: AI Foundations (180 min / 3 hr)

Module 1: Historical Development

Learning Outcome: Understand the historical development and current state of artificial intelligence

Learning Objectives:

- Identify key milestones in AI development from early computing to modern generative AI
- Analyze the significance of breakthrough moments like machine learning, deep learning, and transformer models
- Evaluate how historical developments led to current generative AI capabilities
- Recognize patterns of AI advancement and their implications for future development

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- Connect historical context to contemporary AI applications and limitations

Module 2: Generative AI Use Cases

Learning Outcome: Identify use cases of generative AI relevant to professional workflows

Learning Objectives:

- Identify and categorize generative AI applications for research and information gathering
- Identify and categorize generative AI applications for data analysis and insight generation
- Identify and categorize generative AI applications for content creation and design
- Identify and categorize generative AI applications for communication and presentation
- Identify and categorize generative AI applications for software development
- Identify and categorize generative AI applications for project management

Module 3: Generative AI Tools

Learning Outcome: Identify generative AI productivity tools relevant to professional workflows

Learning Objectives:

- Identify generative AI tools for research and information gathering

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- Identify generative AI tools for data analysis and insight generation
- Identify generative AI tools for content creation and design
- Identify generative AI tools for communication and presentation
- Identify generative AI tools for software development
- Identify generative AI tools for project management

Module 4: Characteristics and Mechanisms of AI

Learning Outcome: Understand fundamental characteristics and mechanisms of AI systems

Learning Objectives:

- Identify fundamental characteristics that define artificial intelligence systems
- Analyze the differences between narrow AI, general AI, and current generative AI capabilities
- Describe the basic principles underlying machine learning and neural networks
- Explain how large language models and generative AI systems process and produce outputs
- Recognize limitations including hallucinations, bias, and context constraints

Module 5: Basics of Prompt Engineering

Learning Outcome: Explain basic prompt engineering techniques for working with generative AI

Learning Objectives:

- Identify the key components of effective generative AI prompts
- Explain how prompt structure and specificity affect AI outputs
- Distinguish between approaches for generating different types of content (analysis, creative, factual)
- Recognize common prompt mistakes and their impact on AI responses
- Describe techniques for refining prompts to improve AI outputs

Module 6: Ethical, Economical, and Legal Implications of AI

Learning Outcome: Evaluate the ethical, economic, social, environmental, and legal implications of generative AI

Learning Objectives:

- Evaluate the ethical implications of AI use in professional contexts
- Evaluate the economic and workforce implications of AI adoption
- Evaluate the social and cultural implications of AI implementation
- Evaluate the environmental implications of AI systems and usage

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- Evaluate the legal and regulatory implications of AI deployment

Chapter 2: Research

Module 1: Generative AI for Research

Learning Outcome: Apply generative AI to gather, investigate, and discover information

Tasks:

- *Define research objectives and information requirements*
- *Generate research prompts to systematically gather information from multiple sources*
- *Organize findings into structured formats (tables, summaries, reports)*
- *Evaluate the completeness, accuracy, and reliability of research results*
- *Refine search strategies and prompts to address information gaps*
- *Synthesize findings into actionable insights and recommendations*

Prompt Engineering Focus: Basic generation and structured questioning

Data Types: Text, tabular, images, audio

Domain Relevance: Students (research assignments), Entrepreneurs

Chapter 3: Analysis

Module 1: Generative AI for Data Analysis

Learning Outcome: Apply generative AI to process, interpret, and extract insights from data

Tasks:

- *Upload and prepare various data formats (spreadsheets, documents, images, audio files)*
- *Design analytical prompts to identify patterns, trends, and key themes*
- *Generate data visualizations, charts, and statistical summaries*
- *Evaluate the relevance, accuracy, and significance of AI-generated insights*
- *Refine analytical approaches to improve depth and precision of analysis*
- *Create comprehensive reports summarizing findings and recommendations*

Prompt Engineering Focus: Evaluation techniques and prompt refinement

Data Types: Tabular, text, images, audio

Domain Relevance: Students (data projects), Entrepreneurs (performance analysis), Corporate (business intelligence)

Chapter 4: Content Creation

Module 1: Generative AI for Content Creation

Learning Outcome: Apply generative AI to create written, visual, and multimedia materials

Tasks:

- *Define content purpose, audience, and format requirements (text, visual, audio, video)*
- *Generate written content using role-based prompting and style control techniques*
- *Create supporting visual elements including graphics, charts, and design layouts*
- *Develop multimedia components such as audio narration or video elements*
- *Apply iterative improvement to enhance quality, consistency, and brand alignment*
- *Adapt content across multiple formats while maintaining core messaging*

Prompt Engineering Focus: Role-based prompting and iterative improvement

Data Types: Text, images, audio, video

Domain Relevance: Students (assignments and projects), Entrepreneurs (marketing materials), Corporate (communications)

Chapter 5: Communication

Module 1: Generative AI for Communication Tasks

Learning Outcome: Apply generative AI to present, share, and exchange information effectively

Tasks:

- *Analyze communication objectives and target audience requirements*
- *Structure content using appropriate templates for different communication formats*
- *Generate presentations, correspondence, proposals, and meeting materials*
- *Create supporting visual aids, slides, and multimedia elements*
- *Develop delivery strategies including speaker notes and interaction points*
- *Design feedback mechanisms and follow-up communication workflows*

Prompt Engineering Focus: Advanced prompt templates and structured workflows

Data Types: Text, images, audio, video

Domain Relevance: Students (presentations), Entrepreneurs (stakeholder communication), Corporate (team coordination)

Chapter 6: Development

Module 1: Generative AI for Technical Tasks

Learning Outcome: Apply generative AI to build applications, systems, and technical solutions

Tasks:

- *Define technical requirements and system specifications*
- *Generate code for applications using appropriate programming languages and frameworks*
- *Implement core functionality, user interfaces, and data processing components*
- *Test system behavior, identify bugs, and implement debugging strategies*
- *Optimize code performance and add error handling mechanisms*
- *Create technical documentation, user guides, and deployment instructions*

Prompt Engineering Focus: Complex workflows and systematic debugging

Data Types: Text (code), tabular (databases), images (UI mockups), audio/video (demos)

Domain Relevance: Students (programming assignments), Entrepreneurs (prototype development), Corporate (automation tools)

Chapter 7: Management

Module 1: Generative AI for Project Coordination

Learning Outcome: Apply generative AI to plan, organize, and coordinate projects and operations

Tasks:

- *Create comprehensive project plans with timelines, milestones, and deliverables*
- *Generate task management frameworks and resource allocation matrices*
- *Develop budget tracking systems and cost analysis reports*
- *Design communication templates for stakeholder coordination and status updates*
- *Create risk management plans and contingency procedures*
- *Build progress monitoring systems and performance evaluation frameworks*

Prompt Engineering Focus: Expert-level prompt engineering and workflow automation

Data Types: Text (plans), tabular (budgets/schedules), images (charts/timelines)

Domain Relevance: Students (group projects), Entrepreneurs (business operations), Corporate (project coordination)