

# ■ Introduction to AI on Azure — Full Module■Wise Summary (Exact Path, Unchanged Names)

Source: Microsoft Learn "Introduction to AI on Azure" Learning Path (14 Modules) — Module names preserved exactly as published.

## 1■■ Overview of AI concepts

**Description:** Introduces the fundamentals of artificial intelligence across generative AI, text & natural language, speech, computer vision, and information extraction; frames the need for Responsible AI in real solutions.

- **What AI is and why it matters** — systems that perceive, reason, and act to augment human capability in apps and agents.
- **Generative AI basics** — LLMs create text/code/summaries; strengths (fluency) and risks (hallucinations) call for grounding and evaluation.
- **NLP, Speech, Vision, Information extraction overview** — core workloads to understand language, converse by voice, see images, and structure documents.
- **Responsible AI principles** — fairness, reliability & safety, privacy & security, inclusiveness, transparency, and accountability; apply guardrails, evaluations, and governance throughout the lifecycle.

■ **Exercise — Explore a simple AI agent (≈15 min):** Build a tiny prompt-based agent; give it a goal, observe how it plans steps, calls a tool (e.g., search or data lookup), and produces a grounded answer. Capture observations about accuracy, safety, and tone to discuss Responsible AI improvements.

## 2■■ Get started in Microsoft Foundry

**Description:** Learn what an AI application is and how Foundry provides a secure, scalable path from ideation to deployment and monitoring on Azure.

- Components of an AI application — data sources, models, orchestration, evaluation, deployment, and observability.
- Microsoft Foundry for AI — model catalog, evaluation datasets, safety filters, prompt playgrounds, and governance controls.
- Getting started — create a project, connect data, choose a model, set up evaluations, and iterate safely.

## 3■■ Introduction to machine learning concepts

**Description:** Core ML ideas and when to use them; connect to deep learning for perception tasks.

- ML model types — supervised, unsupervised (plus a glance at reinforcement).
- Regression, classification (binary/multiclass), clustering — pick based on target variable and business question.
- Deep learning fundamentals — representation learning from raw data (images, text, audio).

## 4 ■■■ Get started with machine learning in Azure

**Description:** Design an end-to-end ML workflow in Azure ML Studio; accelerate with AutoML and track lineage.

- Define problem & success metrics; map to regression/classification/forecasting.
- Prepare data — clean, split, feature engineer; version datasets.
- Train & evaluate; register best model; enable CI/CD for deployments.
- Explore AutoML to automate algorithm selection and hyperparameter tuning.

## 5 ■■■ Introduction to generative AI and agents

**Description:** Understand LLM capabilities and limitations; learn prompting strategies; see how agents plan tasks and call tools safely.

- LLM basics — tokenization, context windows, temperature; capabilities (reasoning patterns, summarization) vs. limits (factuality, recency).
- Prompting — system/user prompts, zero-shot, few-shot, style & constraint prompts; iterative prompt refinement.
- AI agents — tool use (APIs, RAG), multi-step planning, memory, and safety policies to prevent harmful outputs.

## 6 ■■■ Get started with generative AI and agents in Microsoft Foundry

**Description:** Build GenAI apps using Foundry tools, ground models on enterprise data, evaluate safety and quality, and deploy agents with monitoring.

- Workflows — connect data, choose a model, add retrieval grounding, define evaluations, iterate on prompts.
- Model catalog & tools — pick models by capability/cost; configure content filters and jailbreak protections.
- Agent creation — define tools, plan/act loops, logging & monitoring for quality and safety.

## 7 ■■■ Introduction to text analysis concepts

**Description:** NLP enables machines to interpret human language: from tokens to semantics (intent, topics, sentiment).

- NLP fundamentals — tokenization, normalization, embeddings, and semantic similarity.
- Semantic understanding — intent detection, topic inference, and sentiment as signals for downstream tasks.

## 8■■■ Get started with text analysis in Microsoft Foundry

**Description:** Use Azure AI Language (Text Analysis) inside Foundry for common NLP workloads; compose multiple skills in pipelines.

- **Sentiment analysis** — classify positive/neutral/negative; inspect confidence and aspect-level sentiment for products or services.
- **Key phrase extraction** — pull salient concepts to summarize long content and route tickets.
- **Named entity recognition (NER)** — extract people, orgs, locations, dates; map to business schemas.
- **Language detection & translation** — auto-detect language and translate for multilingual scenarios.

## 9■■■ Introduction to AI speech concepts

**Description:** Speech AI converts between voice and text and powers conversational agents.

- Speech-to-text — dictation vs. command/control; acoustic & language models; handling noise and accents.
- Text-to-speech — neural voices, SSML for prosody; latency and naturalness trade-offs.
- Real-time interaction — streaming STT/TTS, barge-in behavior, and error handling.

## ■ Get started with speech in Microsoft Foundry

**Description:** Set up Azure Speech in Foundry; build and evaluate a basic STT/TTS pipeline with locale and voice choices.

- Introduction → Understand recognition & synthesis → Get started on Azure → Use Azure Speech.
- Exercise — configure sample app, evaluate accuracy & latency; record findings for improvement.
- Assessment → Summary.

## 1■■1■■■ Introduction to computer vision concepts

**Description:** Computer vision extracts insights from images/video for search, automation, and safety.

- Tasks — image classification, object detection, OCR; when to use each.
- Face detection & attributes — apply privacy/ethics; avoid identification where restricted.
- Data quality & bias — lighting, occlusion, class imbalance considerations.

## 1■■2■■ Get started with computer vision in Microsoft Foundry

**Description:** Use Azure Vision to analyze images: read text, tag content, find objects, and integrate outputs with apps.

- OCR — printed/handwritten text; layouts and tables.
- Object detection & tagging — detect products, scenes; confidence scores.
- Throughput & cost — batch processing and caching strategies.

## 1■■3■■ Introduction to AI-powered information extraction concepts

**Description:** Transform unstructured documents into structured data for automation and analytics.

- Key■value extraction — map fields (e.g., invoice number, totals).
- Table extraction — capture rows/columns reliably; handle line■item variability.
- Semi■structured documents — strategies for layout variance and templates.

## 1■■4■■ Get started with AI-powered information extraction in Microsoft Foundry

**Description:** Leverage Azure Document Intelligence in Foundry with prebuilt and custom models; evaluate accuracy and export structured outputs.

- Prebuilt models — invoices, receipts, ID docs; fast time■to■value.
- Custom models — train with labeled samples for domain■specific forms.
- Outputs — JSON/CSV for downstream systems; monitor drift and re■train as needed.

Note: Module titles preserved exactly as on Microsoft Learn; expanded descriptions integrated across corresponding modules.