Study guide for Exam AI-102: Designing and Implementing a Microsoft Azure AI Solution

Purpose of this document

This study guide should help you understand what to expect on the exam and includes a summary of the topics the exam might cover and links to additional resources. The information and materials in this document should help you focus your studies as you prepare for the exam.

Useful links	Description
Review the skills measured as of May 2, 2023	This list represents the skills measured AFTER the date provided. Study this list if you plan to take the exam AFTER that date.
Review the skills measured prior to May 2, 2023	Study this list of skills if you take your exam PRIOR to the date provided.
Change log	You can go directly to the change log if you want to see the changes that will be made on the date provided.
How to earn the certification	Some certifications only require passing one exam, while others require passing multiple exams.
Certification renewal	Microsoft associate, expert, and specialty certifications expire annually. You can renew by passing a **free** online assessment on Microsoft Learn.
Your Microsoft Learn profile	Connecting your certification profile to Microsoft Learn allows you to schedule and renew exams and share and print certificates.
Exam scoring and score reports	A score of 700 or greater is required to pass.
Exam sandbox	You can explore the exam environment by visiting our exam sandbox.

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Useful links	Description
Request accommodations	If you use assistive devices, require extra time, or need modification to any part of the exam experience, you can request an accommodation.
Take a practice test	Are you ready to take the exam or do you need to study a bit more?

Updates to the exam

Our exams are updated periodically to reflect skills that are required to perform a role. We have included two versions of the Skills Measured objectives depending on when you are taking the exam.

We always update the English language version of the exam first. Some exams are localized into other languages, and those are updated approximately eight weeks after the English version is updated. While Microsoft makes every effort to update localized exams as noted, there may be times when the localized versions of an exam are not updated on this schedule. Other available languages are listed in the **Schedule Exam** section of the **Exam Details** webpage. If the exam isn't available in your preferred language, you can request an additional 30 minutes to complete the exam.

Note

The bullets that follow each of the skills measured are intended to illustrate how we are assessing that skill. Related topics may be covered in the exam.

Note

Most questions cover features that are general availability (GA). The exam may contain questions on Preview features if those features are commonly used.

Skills measured as of May 2, 2023

Audience profile

Microsoft Azure AI engineers build, manage, and deploy AI solutions that make the most of Azure Cognitive Services and Azure services. Their responsibilities include participating in all phases of AI solutions development—from requirements definition and design to development, deployment, integration, maintenance, performance tuning, and monitoring.

These professionals work with solution architects to translate their vision and with data scientists, data engineers, IoT specialists, infrastructure administrators, and other software developers to build complete end-to-end AI solutions.

Azure AI engineers have experience developing solutions that use languages such as Python or C# and should be able to use REST-based APIs and software development kits (SDKs) to build secure image processing, video processing, natural language processing (NLP), knowledge mining, and conversational AI solutions on Azure. They should be familiar with all methods of implementing AI solutions. Plus, they

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understand the components that make up the Azure AI portfolio and the available data storage options. Azure AI engineers also need to understand and be able to apply responsible AI principles.

- Plan and manage an Azure AI solution (25–30%)
- Implement image and video processing solutions (15–20%)
- Implement natural language processing solutions (25–30%)
- Implement knowledge mining solutions (5–10%)
- Implement conversational AI solutions (15–20%)

Plan and manage an Azure AI solution (25–30%)

Select the appropriate Azure AI service

- Select the appropriate service for a vision solution
- Select the appropriate service for a language analysis solution
- Select the appropriate service for a decision support solution
- Select the appropriate service for a speech solution
- Select the appropriate Applied AI services

Plan and configure security for Azure AI services

- Manage account keys
- Manage authentication for a resource
- Secure services by using Azure Virtual Networks
- Plan for a solution that meets Responsible AI principles

Create and manage an Azure AI service

- Create an Azure AI resource
- Configure diagnostic logging
- Manage costs for Azure AI services
- Monitor an Azure AI resource

Deploy Azure AI services

- Determine a default endpoint for a service
- Create a resource by using the Azure portal
- Integrate Azure AI services into a continuous integration/continuous deployment (CI/CD) pipeline
- Plan a container deployment
- Implement prebuilt containers in a connected environment

Create solutions to detect anomalies and improve content

- Create a solution that uses Anomaly Detector, part of Cognitive Services
- Create a solution that uses Azure Content Moderator, part of Cognitive Services
- Create a solution that uses Personalizer, part of Cognitive Services

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- Create a solution that uses Azure Metrics Advisor, part of Azure Applied AI Services
- Create a solution that uses Azure Immersive Reader, part of Azure Applied AI Services

Implement image and video processing solutions (15–20%)

Analyze images

- Select appropriate visual features to meet image processing requirements
- Create an image processing request to include appropriate image analysis features
- Interpret image processing responses

Extract text from images

- Extract text from images or PDFs by using the Computer Vision service
- Convert handwritten text by using the Computer Vision service
- Extract information using prebuilt models in Azure Form Recognizer
- Build and optimize a custom model for Azure Form Recognizer

Implement image classification and object detection by using the Custom Vision service, part of Azure Cognitive Services

- Choose between image classification and object detection models
- Specify model configuration options, including category, version, and compact
- Label images
- Train custom image models, including classifiers and detectors
- Manage training iterations
- Evaluate model metrics
- Publish a trained iteration of a model
- Export a model to run on a specific target
- Implement a Custom Vision model as a Docker container
- Interpret model responses

Process videos

- Process a video by using Azure Video Indexer
- Extract insights from a video or live stream by using Azure Video Indexer
- Implement content moderation by using Azure Video Indexer
- Integrate a custom language model into Azure Video Indexer

Implement natural language processing solutions (25–30%)

Analyze text

- Retrieve and process key phrases
- Retrieve and process entities
- Retrieve and process sentiment

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- Detect the language used in text
- Detect personally identifiable information (PII)

Process speech

- Implement and customize text-to-speech
- Implement and customize speech-to-text
- Improve text-to-speech by using SSML and Custom Neural Voice
- Improve speech-to-text by using phrase lists and Custom Speech
- Implement intent recognition
- Implement keyword recognition

Translate language

- Translate text and documents by using the Translator service
- Implement custom translation, including training, improving, and publishing a custom model
- Translate speech-to-speech by using the Speech service
- Translate speech-to-text by using the Speech service
- Translate to multiple languages simultaneously

Build and manage a language understanding model

- Create intents and add utterances
- Create entities
- Train evaluate, deploy, and test a language understanding model
- Optimize a Language Understanding (LUIS) model
- Integrate multiple language service models by using Orchestrator
- Import and export language understanding models

Create a question answering solution

- Create a question answering project
- Add question-and-answer pairs manually
- Import sources
- Train and test a knowledge base
- Publish a knowledge base
- Create a multi-turn conversation
- Add alternate phrasing
- Add chit-chat to a knowledge base
- Export a knowledge base
- Create a multi-language question answering solution
- Create a multi-domain question answering solution
- Use metadata for question-and-answer pairs

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Implement knowledge mining solutions (5–10%)

Implement a Cognitive Search solution

- Provision a Cognitive Search resource
- Create data sources
- Define an index
- Create and run an indexer
- Query an index, including syntax, sorting, filtering, and wildcards
- Manage knowledge store projections, including file, object, and table projections

Apply AI enrichment skills to an indexer pipeline

- Attach a Cognitive Services account to a skillset
- Select and include built-in skills for documents
- Implement custom skills and include them in a skillset
- Implement incremental enrichment

Implement conversational AI solutions (15–20%)

Design and implement conversation flow

- Design conversational logic for a bot
- Choose appropriate activity handlers, dialogs or topics, triggers, and state handling for a bot

Build a conversational bot

- Create a bot from a template
- Create a bot from scratch
- Implement activity handlers, dialogs or topics, and triggers
- Implement channel-specific logic
- Implement Adaptive Cards
- Implement multi-language support in a bot
- Implement multi-step conversations
- Manage state for a bot
- Integrate Cognitive Services into a bot, including question answering, language understanding, and Speech service

Test, publish, and maintain a conversational bot

- Test a bot using the Bot Framework Emulator or the Power Virtual Agents web app
- Test a bot in a channel-specific environment
- Troubleshoot a conversational bot
- Deploy bot logic

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Study resources

We recommend that you train and get hands-on experience before you take the exam. We offer self-study options and classroom training as well as links to documentation, community sites, and videos.

Study resources	Links to learning and documentation
Get trained	[Choose from self-paced learning paths and modules or take an instructor-led course](#)
Find documentation	[Azure Cognitive Services](#)
	[Computer Vision](#)
	[Azure Video Indexer](#)
	[Language Understanding](#)
	[Speech to Text](#)
	[Speech Translation](#)
	[Azure Cognitive Search](#)
	[Azure Bot Service](#)
Ask a question	[Microsoft Q&A	Microsoft Docs](#)
Get community support	[AI - Machine Learning - Microsoft Tech Community](#)
	[AI - Machine Learning Blog - Microsoft Tech Community](#)
Follow Microsoft Learn	[Microsoft Learn - Microsoft Tech Community](#)
Find a video	[The AI Show](#)
	[Browse other Microsoft Learn shows](#)

Change log

Key to understanding the table: The topic groups (also known as functional groups) are in bold typeface followed by the objectives within each group. The table is a comparison between the two versions of the exam skills measured and the third column describes the extent of the changes.

Skill area prior to May 2, 2023	Skill area as of May 2, 2023	Changes
Audience profile		No change

Skill area prior to May 2, 2023	Skill area as of May 2, 2023	Changes
Plan and manage an Azure AI solution	**Plan and manage an Azure AI solution**	No change
Select the appropriate Azure AI service	Select the appropriate Azure AI service	Minor
Plan and configure security for Azure AI services	Plan and configure security for Azure AI services	No change
Create and manage an Azure AI service	Create and manage an Azure AI service	No change
Deploy Azure AI services	Deploy Azure AI services	No change
Create solutions to detect anomalies and improve content	Create solutions to detect anomalies and improve content	Minor
Implement image and video processing solutions	**Implement image and video processing solutions**	No change
Analyze images	Analyze images	No change
Extract text from images	Extract text from images	Minor
Implement image classification and object detection by using the Custom Vision service	Implement image classification and object detection by using the Custom Vision service	No change
Process videos	Process videos	No change
Implement natural language processing solutions	**Implement natural language processing solutions**	No change
Analyze text	Analyze text	No change
Process speech	Process speech	No change
Translate language	Translate language	No change
Build and manage a language understanding model	Build and manage a language understanding model	Minor
Create a question answering solution	Create a question answering solution	No change
Implement knowledge mining solutions	**Implement knowledge mining solutions**	No change
Implement a Cognitive Search solution	Implement a Cognitive Search solution	No change

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Skill area prior to May 2, 2023	Skill area as of May 2, 2023	Changes
Apply AI enrichment skills to an indexer pipeline	Apply AI enrichment skills to an indexer pipeline	No change
Implement conversational AI solutions	**Implement conversational AI solutions**	No change
Design and implement conversation flow	Design and implement conversation flow	No change
Build a conversational bot	Build a conversational bot	Minor
Test, publish, and maintain a conversational bot	Test, publish, and maintain a conversational bot	No change

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