Study Guide

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
How to earn the certification	Some certifications only require one exam, while others require more. On the details page, you'll find information about what skills are measured and links to registration. Each exam also has its own details page covering exam specifics.
Certification renewal	Once you earn your certification, don't let it expire. When you have an active certification that's expiring within six months, you should renew it—at no cost—by passing a renewal assessment on Microsoft Learn. Remember to renew your certification annually if you want to retain it.
Your Microsoft Learn profile	Connecting your certification profile to Learn brings all your learning activities together. You'll be able to schedule and renew exams, share and print certificates, badges and transcripts, and review your learning statistics inside your Learn profile.
Passing score	All technical exam scores are reported on a scale of 1 to 1,000. A passing score is 700 or greater. As this is a scaled score, it may not equal 70% of the points. A passing score is based on the knowledge and skills needed to demonstrate competence as well as the difficulty of the questions.
Exam sandbox	Are you new to Microsoft certification exams? You can explore the exam environment by visiting our exam sandbox. We created the sandbox as an opportunity for you to experience an exam before you take it. In the sandbox,

Useful links	Description
	you can interact with different question types, such as build list, case studies, and others that you might encounter in the user interface when you take an exam. Additionally, it includes the introductory screens, instructions, and help topics related to the different types of questions that your exam might include. It also includes the non-disclosure agreement that you must accept before you can launch the exam.
Request accommodations	We're committed to ensuring all learners are set up for success. 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	Taking a practice test is a great way to know whether you're ready to take the exam or if you need to study a bit more. Subject-matter experts write the Microsoft Official Practice Tests, which are designed to assess all exam objectives.

Objective domain: skills the exam measures

The English language version of this exam was updated on August 2, 2022.

Some exams are localized into other languages, and those are updated approximately eight weeks after the English version is updated. 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

- Plan and manage an Azure Cognitive Services solution (15–20%)
- Implement Computer Vision solutions (20–25%)
- Implement natural language processing solutions (20–25%)
- Implement knowledge mining solutions (15–20%)
- Implement conversational AI solutions (15–20%)

Functional groups

Plan and manage an Azure Cognitive Services solution (15—20%)

Select the appropriate Cognitive Services resource

- Select the appropriate cognitive service for a vision solution
- Select the appropriate cognitive service for a language analysis solution
- Select the appropriate cognitive Service for a decision support solution
- Select the appropriate cognitive service for a speech solution

Plan and configure security for a Cognitive Services solution

- Manage Cognitive Services account keys
- Manage authentication for a resource
- Secure Cognitive Services by using Azure Virtual Network
- Plan for a solution that meets responsible AI principles

Create a Cognitive Services resource

- Create a Cognitive Services resource
- Configure diagnostic logging for a Cognitive Services resource
- Manage Cognitive Services costs
- Monitor a Cognitive Services resource
- Implement a privacy policy in Cognitive Services

Plan and implement Cognitive Services containers

- Identify when to deploy to a container
- Containerize Cognitive Services (including Computer Vision, Face API, Language, Speech, Form Recognizer)
- Deploy Cognitive Services containers in Microsoft Azure

Implement Computer Vision solutions (20—25%)

Analyze images by using the Computer Vision API

- Retrieve image descriptions and tags by using the Computer Vision API
- Identify landmarks and celebrities by using the Computer Vision API
- Detect brands in images by using the Computer Vision API
- Moderate content in images by using the Computer Vision API
- Generate thumbnails by using the Computer Vision API

Extract text from images

- Extract text from images or PDFs by using the Computer Vision service
- Extract information using pre-built models in Form Recognizer

- Build and optimize a custom model for Form Recognizer

Extract facial information from images

- Detect faces in an image by using the Face API
- Recognize faces in an image by using the Face API
- Match similar faces by using the Face API

Implement image classification by using the Custom Vision service

- Label images by using the Custom Vision Portal
- Train a custom image classification model in the Custom Vision Portal
- Train a custom image classification model by using the SDK
- Manage model iterations
- Evaluate classification model metrics
- Publish a trained iteration of a model
- Export a model in an appropriate format for a specific target
- Consume a classification model from a client application
- Deploy image classification custom models to containers

Implement an object detection solution by using the Custom Vision service

- Label images with bounding boxes by using the Custom Vision Portal
- Train a custom object detection model by using the Custom Vision Portal
- Train a custom object detection model by using the SDK
- Manage model iterations
- Evaluate object detection model metrics
- Publish a trained iteration of a model
- Consume an object detection model from a client application
- Deploy custom object detection models to containers

Analyze video by using Azure Video Analyzer for Media (formerly Video Indexer)

- Process a video
- Extract insights from a video
- Moderate content in a video
- Customize the Brands model used by Video Indexer
- Customize the Language model used by Video Indexer by using the Custom Speech service
- Customize the Person model used by Video Indexer
- Extract insights from a live stream of video data

Implement natural language processing solutions (20—25%)

Analyze text by using the Language service

- Retrieve and process key phrases
- Retrieve and process entity information (people, places, urls, etc.)
- Retrieve and process sentiment
- Detect the language used in text

Manage speech by using the Speech service

- Implement text-to-speech
- Customize text-to-speech
- Implement speech-to-text
- Improve speech-to-text accuracy
- Improve text-to-speech accuracy
- Implement intent recognition

Translate language

- Translate text by using the Translator service
- Translate speech-to-speech by using the Speech service
- Translate speech-to-text by using the Speech service

Build an initial language model by using language understanding

- Create intents and entities based on a schema, and add utterances
- Create complex hierarchical entities
- Train and deploy a model

Iterate on and optimize a language model by using language understanding

- Implement phrase lists
- Implement a model as a feature (i.e., prebuilt entities)
- Manage punctuation and diacritics
- Implement active learning
- Monitor and correct data imbalances
- Implement patterns

Manage a language understanding model

- Manage collaborators
- Manage versioning
- Publish a model through the portal or in a container
- Export a Language Service package
- Deploy a Language Service package to a container

Create a Questions Answering solution using the Language service

- Create a question answering project
- Import questions and answers
- 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
- Add active learning to a knowledge base

Implement knowledge mining solutions (15—20%)

Implement a Cognitive Search solution

- Create data sources
- Define an index
- Create and run an indexer
- Query an index
- Configure an index to support autocomplete and autosuggest
- Boost results based on relevance
- Implement synonyms

Implement an AI enrichment 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 a knowledge store

- Define file projections
- Define object projections
- Define table projections
- Query projections

Manage a Cognitive Search solution

- Provision Cognitive Search
- Configure security for Cognitive Search
- Configure scalability for Cognitive Search

Manage indexing

- Manage re-indexing
- Rebuild indexes

- Schedule indexing
- Monitor indexing
- Implement incremental indexing
- Manage concurrency
- Push data to an index
- Troubleshoot indexing for a pipeline

Implement conversational AI solutions (15—20%)

Design and implement conversation flow

- Design conversational logic for a bot
- Create and evaluate .chat file conversations by using the Bot Framework Emulator
- Choose an appropriate conversational model for a bot, including activity handlers and dialogs

Create a bot by using the Bot Framework SDK

- Use the Bot Framework SDK to create a bot from a template
- Implement activity handlers and dialogs
- Use a turn context
- Test a bot using the Bot Framework Emulator
- Deploy a bot to Azure

Create a bot by using the Bot Framework Composer

- Implement dialogs
- Maintain state
- Implement logging for a bot conversation
- Implement prompts for user input
- Troubleshoot a conversational bot
- Test a bot
- Publish a bot
- Add language generation for a response
- Design and implement Adaptive Cards

Integrate Cognitive Services into a bot

- Integrate a question answering model
- Integrate a language understanding service
- Integrate a Speech service resource

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
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