Introduction to Artificial Intelligence explores the foundational principles and practices of artificial intelligence (AI), machine learning, and robotics. The course prepares students to analyze relationships, build agents, and create models relevant to AI problems. The prerequisites for this course are Introduction to Probability and Statistics as well as Data Structures and Algorithms II.

# Introduction

Welcome to Introduction to Artificial Intelligence!

This course will prepare you to demonstrate achievement of 5 competencies, earning you 3 competency units toward your degree!

You will demonstrate competency through a performance assessment.

The prerequisites for this course are Introduction to Probability and Statistics as well as Data Structures and Algorithms II.

# Course Overview

This course includes the following competencies:

**Reasoning, Knowledge Representation, Uncertainty, and Intelligence**

*The graduate analyzes the relationships and rules pertaining to intelligence within systems.*

**Search Strategies for Optimization**

*The graduate distinguishes among search strategies to fit specific data-oriented problems.*

**Agents**

*The graduate implements basic intelligent agent technology in order to automate services.*

**Machine Learning**

*The graduate creates models with machine learning algorithms in order to extract actionable insights from data.*

**Robotics**

*The graduate writes code to enable robots to execute simple tasks.*

## Course Organization

To access your course materials, use the table of contents that follows to open each major section of the course. Once opened, review the titles of each section and its supporting lessons and sub-lessons. Click on any link in the section to access the course content and activities.

If you choose to skip any part of the course, be sure to select the "Skip" button. If you complete a content review or an activity, be sure select the "Complete" button. A progress bar in the upper left will track your progress based on your selections.

Work with your program mentor and course instructor to customize your plan for this course. Review a general recommendation for Topics and Pacing.

## Learning Resources

The learning resources listed in this section are required to complete the activities in this course. For many resources, WGU has provided automatic access through the course. However, there may be times when you may need to manually enroll in or independently acquire other resources. Always read the instructions provided to ensure you have access to course resources as you need them.

### Automatically Enrolled Resources

Access the learning resources listed in this section by clicking on the links provided throughout the course. You may be prompted to log in to the WGU student portal to access the resources.

### Textbook

Content will be drawn from the following text:

- Russell, S., & Norvig, P. (2020). *Artificial intelligence: A modern approach* (4th ed.). Upper Saddle River, NJ: Pearson. ISBN: 9780134610993

### Video Course

Calnan, Colin. (2017). *Exploring chatbots*. Online courseware.

# Course Assessment

Your competence will be assessed in a performance assessment with three tasks.

## Assessment Prep

To prepare for your performance assessment, read each of the assigned chapters of *Artificial Intelligence* and watch *Exploring Chatbots*. Engage with each WGU Lesson and follow its instructions. You will also need to conduct independent research in the WGU Library.

You have access to the complete *Artificial Intelligence* ebook. Chapters that are not specifically identified within this course are supplemental and are not essential for success on the assessment.

Appendix A: Mathematical Background and Appendix B: Notes on Languages and Algorithms may be useful references.

## Performance Assessment

You will complete three tasks in this performance assessment:

1. Chatbot
2. Disaster Recovery Robot
3. Machine Learning Project Proposal

Review the rubrics and carefully follow the instructions for each task.

When ready, complete your Performance Assessment in the Assessments tab.

# Introduction to Artificial Intelligence

Proceed through the sections of *Artificial Intelligence*, reading each assigned chapter and completing the other linked activities.

## I Artificial intelligence

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

### Chapter 1

Introduction

### Chapter 2

Intelligent Agents

## II Problem-solving

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

### Chapter 3

Solving Problems by Searching

### Chapter 4

Search in Complex Environments

### Chapter 5

Adversarial Search and Games

### Chapter 6

Constraint Satisfaction Problems

## III Knowledge, reasoning, and planning

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

*Note:* Chapter 11: Automated Planning is supplemental.

### Chapter 7

Logical Agents

### Chapter 8

First-Order Logic

### Chapter 9

Inference in First-Order Logic

### Chapter 10

Knowledge Representation

### Percipio Course

Exploring Chatbots

### WGU Lesson

Chatbots

## IV Uncertain knowledge and reasoning

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

*Note:* The following chapters are supplemental:

14.Probabilistic Reasoning Over Time

15.Probabilistic Programming

16.Making Simple Decisions

17.Making Complex Decisions

18.Multiagent Decision Making

### Chapter 12

Quantifying Uncertainty

### Chapter 13

Probabilistic Reasoning

## V Artificial Intelligence Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

### Chapter 19

Learning from Examples

### Chapter 20

Learning Probabilistic Models

### Chapter 21

Deep Learning

### Chapter 22

Reinforcement Learning

## VI Communicating, perceiving, and acting

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

*Note:* The following chapters are supplemental:

23.Natural Language Processing

24.Deep Learning for Natural Language Processing

25.Computer Vision

### Chapter 26

Robotics

### WGU Lesson

Robotics and Feature Engineering

### WGU Lesson

Machine Learning

## VII Conclusions

Explore the links that follow. Each link will open in a new tab. Remember to return here to track your progress by checking off pages you completed or skipped.

### Chapter 27

Philosophy, Ethics, and Safety of AI

### Chapter 28

The Future of AI