



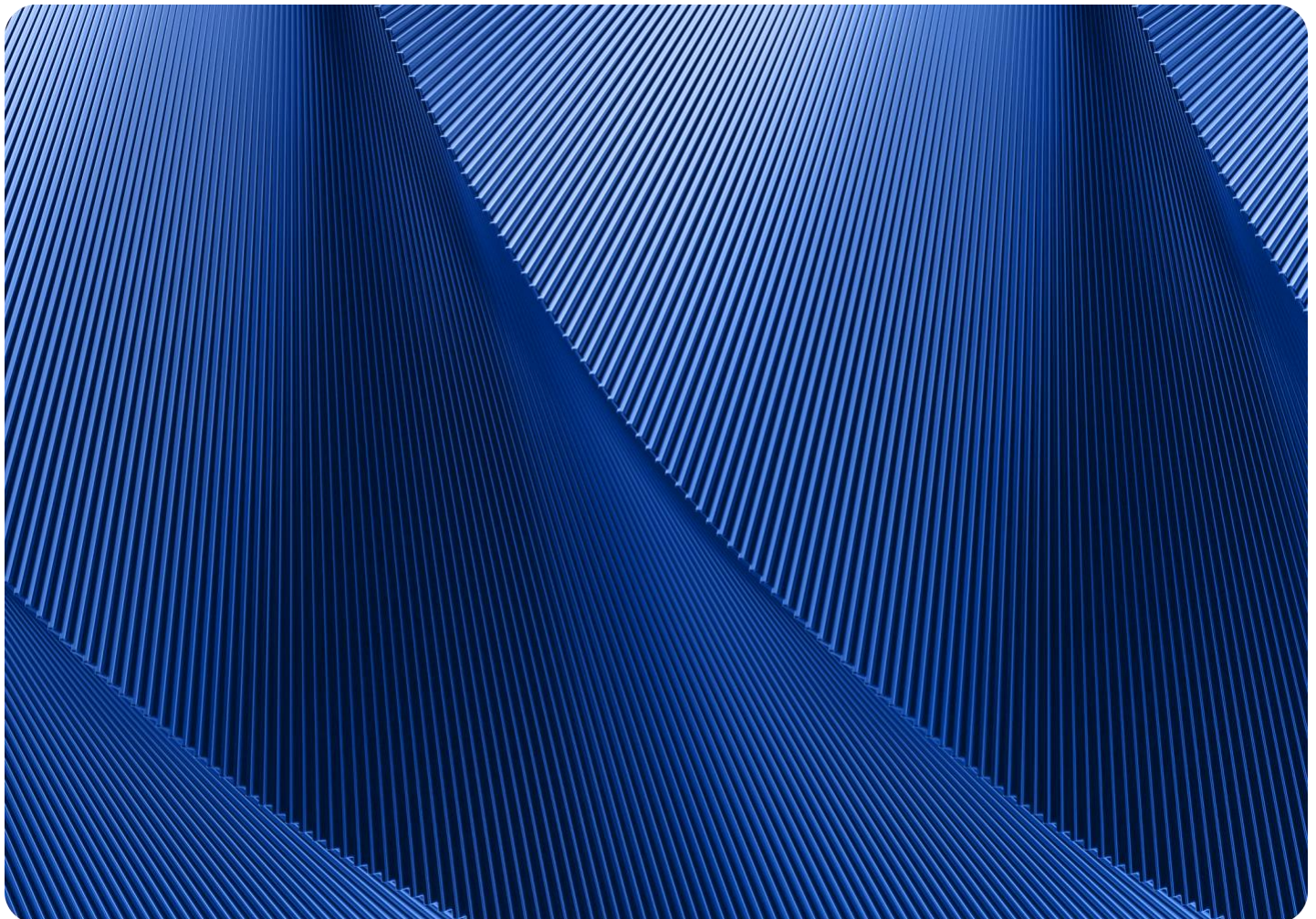
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## Course Syllabus

# Introduction to Artificial Intelligence

This introductory course provides hands-on experience with artificial intelligence concepts, techniques, and real-world applications.





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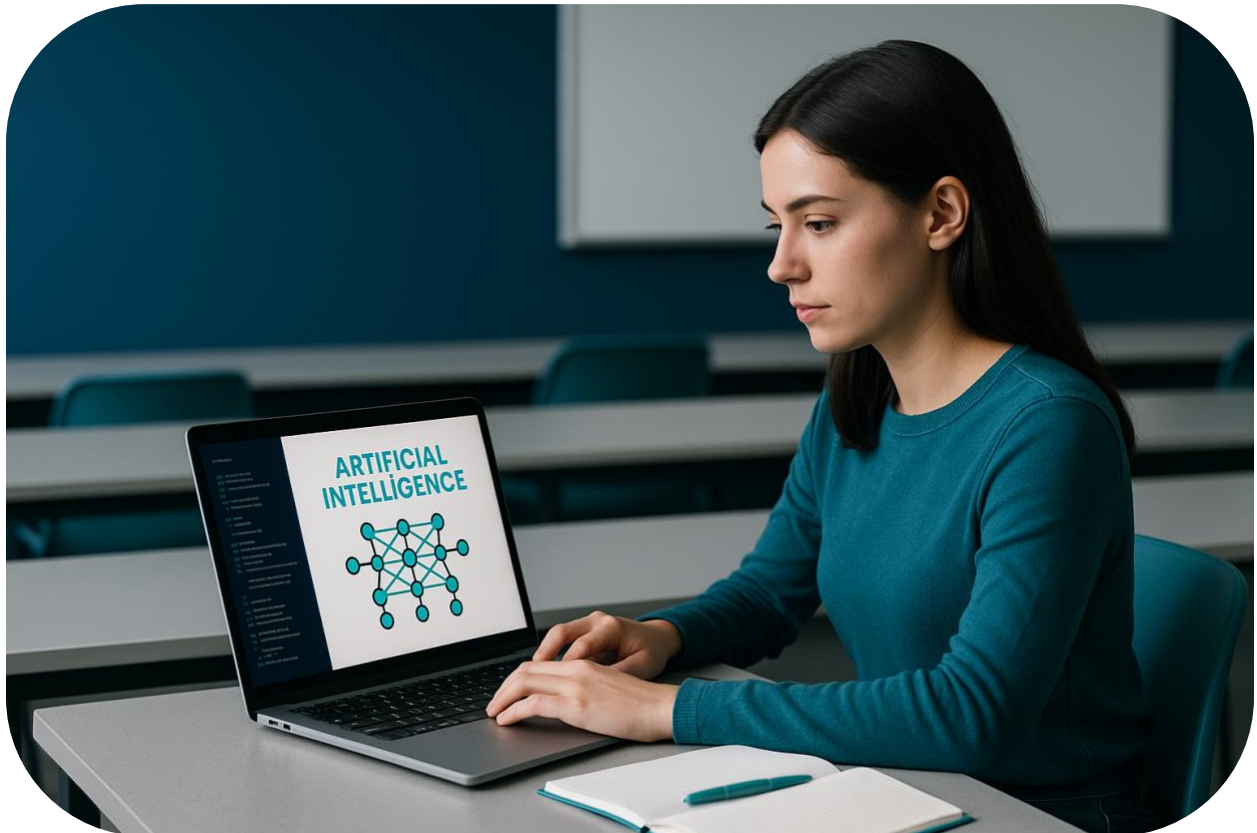
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# Course Description

Basic concepts and applications of artificial intelligence (AI), including AI project cycles. Focus on issues surrounding AI including ethics, bias, culture, regulations, and professional expectation.

## Prerequisites:

Familiarity with programming languages (specifically Python)  
Basic statistics, calculus, and linear algebra



# Course Competencies

|  |
|--|
| Competency 1   |
| Describe the different emerging trends in technology   |
| Competency 2   |
| Describe the potential impact of AI to our world   |
| Competency 3   |
| Identify the three common domains of AI related to data, computer vision and natural language processing |
| Competency 4   |
| Identify systems thinking methods to decompose complex social issues                                     |
| Competency 5   |
| Describe how AI impacts jobs in various industries   |
| Competency 6   |
| Evaluate the societal and ethical implications surrounding AI  |
| Competency 7   |
| Describe the stages in the AI project cycle  |
| Competency 8   |
| Explain the fundamental concepts of Data Science   |



# Instructional Resources

No prescribed textbook is required due to the rapidly evolving nature of artificial intelligence tools, frameworks, and best practices.

## Resources for Learning Artificial Intelligence/Machine Learning

### Beginner:

Little knowledge of programming languages (specifically Python)

Little knowledge of statistics, calculus, linear algebra

Little to no knowledge of statistical learning or machine learning

- [kaggle.com Learn](https://www.kaggle.com/learn)
- [Coursera - AI Python for Beginners](https://www.coursera.org/learn/artificial-intelligence)
- [Coursera - Generative AI for Everyone](https://www.coursera.org/learn/generative-ai)
- [Coursera - Mathematics for ML and Data Science](https://www.coursera.org/learn/mathematics-for-machine-learning)
- [The 100 Page ML Book](https://mmlbook.github.io/)

### Developer:

Know the basics of Python with a sprinkle of Numpy, Pandas, etc.

Know the basics of statistics, calculus, linear algebra

Heard of Linear/Logistic Regression, SVMs, Decision Trees

- [Stanford CS229: Machine Learning Course, Lecture 1 - Andrew Ng \(Autumn 2018\)](https://www.youtube.com/watch?v=6sHhRmK1oY0)
- [Neural Networks: Zero to Hero by Tesla Engineer](https://www.youtube.com/watch?v=QV8eUg1vQ08)
- [Coursera - Machine Learning Specialization](https://www.coursera.org/specializations/machine-learning-introduction)
- [Coursera - Deep Learning Specialization](https://www.coursera.org/specializations/deep-learning)
- [Stat Quest YouTube Channel](https://www.youtube.com/channel/UC8butbF2UqXUoUz9wRfZp8w)
- [3Blue1Brown YouTube Channel](https://www.youtube.com/channel/UC8butbF2UqXUoUz9wRfZp8w)
- [Book - The Elements of Statistical Learning](https://www.elementsofstatlearning.com/)
- [Book - Deep Learning with Python](https://www.manning.com/books/deep-learning-with-python)
- [Book - Grokking Machine Learning](https://www.grokkingmachinelearning.com/)
- [Crash Course on Machine Learning by Google](https://www.coursera.org/learn/machine-learning)
- [fast.ai Tutorial](https://fast.ai/)
- [Machine Learning Mastery Website](https://mmlbook.github.io/)



**Expert:**

Very familiar with the Python Programming Language

Can comprehend advanced mathematical formulas in a wide variety

Are bored of seeing the ML Concepts from the Developer Section

- [Berkeley Course - Reinforcement Learning](#)
- [Your Choice of DeepLearning.ai Courses](#)
- [Start Reading Research Papers!](#)
- [Natural Language Processing with Deep Learning Stanford Course](#)
- [PyImageSearch - Computer Vision](#)
- [Computer Vision at UC Berkeley](#)
- [Speech and Language Processing - Stanford Book](#)
- [Natural Language Processing with Transformers Book](#)
- [Computer Vision: Algorithms and Applications 2nd Ed. Book](#)
- [Artificial Intelligence: A Modern Approach Book](#)

## Grading Schema

| Assignment Type                   | Percentage of Grade |
|-----------------------------------|---------------------|
| Lectures                          | 15%                 |
| Discussions and Writing responses | 10%                 |
| Quizzes                           | 10%                 |
| Presentation                      | 15%                 |
| Labs                              | 25%                 |
| Final Exam                        | 20%                 |
| Student Participation             | 5%                  |
| Total                             | 100%                |



# Supplemental Information

Student learning will be assessed through a variety of activities and assignments throughout the course. These expectations will be detailed by the instructor.

## **Assigned Lectures:**

Each week you will be assigned lectures to watch that relate to the discussion posts, quizzes and presentations that you may have to perform throughout the class. These lectures will contain quizzes within the video. You will not have the ability to skip ahead in the video.

## **Discussion Posts:**

There will typically be a discussion post consisting of a few paragraphs (1-3) on a topic relating to our lecture. These will be due before the following lecture.

## **Presentations:**

There will be two major presentations in the class. These will be less than 10-minute presentations that require you to be able to record your own audio, web camera and presentation slides.

## **Quizzes:**

All quizzes will be taken online over Canvas. All have two attempts that tell you what questions you got wrong, but not what the answer is. The time on the quizzes is unlimited. Most quizzes comprise of 10 questions.

## **Labs:**

There will be 5 labs that will give you a hands-on look into AI concepts. Each of these will be due in a week. There is no programming background required to complete these labs. There is no software or hardware necessary for these labs.

## **Final Exam:**

There will be a final exam consisting of about 20 questions. There will be a study guide to make sure you are prepared for this.

## Course Outline

| Week starting on / Module | Module Topic  | Assignments  |
|---------------------------|---|--|
| Week 1                    | Lecture 0 - Introduction/Syllabus<br>Lecture 1 - Introduction to AI   | 1. Discussion 0 - Intro and Goal Setting Due<br>2. Syllabus Quiz Due<br>3. Lab 1 Assigned              |
| Week 2                    | Lecture 2 - Intro to Data<br>Lecture 3 - Intro to Computer Vision<br>Lecture 4 - Intro to Natural Language Processing | 1. Quiz 1 - Data Due<br>2. Quiz 2 - Computer Vision Due<br>3. Quiz 3 - Natural Language Processing Due |
| Week 3                    | Lecture 5 - Machine Learning Modeling and Workflow  | 1. Lab 2 Due<br>2. Quiz 4 - ML Modeling and Workflow Due   |
| Week 4                    | Lecture 6 - Emerging Technologies   | 1. Emerging Tech Presentation Due  |
| Week 5                    | Lecture 7 - Large Language Models and Text-to-Image Models  | 1. Lab 3 Due   |
| Week 6                    | Lecture 8 - AI Industry Guest Speaker and the Future of Success in AI   | 1. Discussion 1 - AI Jobs in Industry Due<br>2. Lab 4 Due  |
| Week 7                    | Lecture 9 - AI Ethics   | 1. AI Ethics Presentation Due<br>2. Lab 5 Due  |
| Week 8                    | Final Exam  | 1. Final Exam Due  |