



# JOHNS HOPKINS

## CAREY BUSINESS SCHOOL

Version 1.0

### AI Essentials for Business

BU.520.710 (T1)

2 Credits

Spring I, 2025, DC Campus (555 Penn), Room B230

Start: 01-23-2025 End: 03-13-2025.

Thursdays 08:15 AM - 11:15 AM

Canvas link: <https://jhu.instructure.com/courses/87885>

### Instructor

Gordon Gao

### Contact Information

[Gordon.Gao@jhu.edu](mailto:Gordon.Gao@jhu.edu)

### Office Hours

Fri 2-4pm (on Zoom), and by appointment

TA: Lois Wong, [lwong23@jh.edu](mailto:lwong23@jh.edu)

### Recommended Texts & Learning Materials

A significant proportion of the reading material for this course is available online and is free. When necessary, additional reading material will be posted on Canvas. No need to purchase textbooks.

In case you would like to go deep with technology, a good reference book on the technology side: Machine Learning with PyTorch and Scikit-Learn.

<https://www.packtpub.com/product/machine-learning-with-pytorch-and-scikit-learn/9781801819312>

Two good “business AI” books (although a bit outdated in AI – the tech is just advancing too fast):

1. A Human's Guide to Machine Intelligence, by Kartik Hosanagar  
(<https://www.amazon.com/Humans-Guide-Machine-Intelligence-Algorithms/dp/0525560882>)
2. Power and Prediction: The Disruptive Economics of Artificial Intelligence, by Ajay Agrawal, Joshua Gans, Avi Goldfarb ([https://www.amazon.com/Power-Prediction-Disruptive-Artificial-Intelligence-ebook/dp/B09Q6GT9JN?ref=ast\\_author\\_dp](https://www.amazon.com/Power-Prediction-Disruptive-Artificial-Intelligence-ebook/dp/B09Q6GT9JN?ref=ast_author_dp))

### Technology Requirements

For all exercises you will need a laptop with the Chrome browser.

## Course Description

Artificial Intelligence (AI) is making substantial inroads into our everyday lives, demonstrating tremendous potential across numerous domains, including business and healthcare. This course aims to impart learners with crucial understanding of AI's core technologies, such as neural networks, deep learning, computer vision, natural language processing, and generative AI. We will also provide a succinct introduction to the burgeoning areas within AI. This course takes a hands-on, experiential learning approach, making use of the latest cloud computing platforms to provide practical understanding and application. Through this course, students will establish a robust comprehension of vital AI technologies, equipping themselves with the working knowledge required to harness these technologies in driving business growth and creating value.

The technologies are still evolving very rapidly. Therefore, there is a level of experimentation with new material that will take place during the semester. Students are required to be flexible as and when topics or material in class are revised or modified. We will do our best to ensure that no undue burden is placed on students.

### Prerequisite(s)

None

### Learning Objectives

The course has two primary objectives:

1. To allow students to have working knowledge and exposure to key elements of AI using Cloud Computing platform
2. To allow students to understand critical business and strategic issues around the use of these technologies in organizations and to help guide the successful design and implementation of complex data strategy.

By the end of the class, students should be able to:

- Understand the evolution of AI
- Think critically about the benefits and limitation of AI
- Implement the AI skills learned in a hands-on real-world project
- Communicate effectively the technology used in the project and the findings

Though mastery of this content requires more than one course, an introductory course, such as this, is useful in allowing students to gain much-needed familiarity with AI for more advanced courses.

### Attendance

Attendance and class participation are part of each student's course grade. Students are expected to attend all scheduled class sessions. Failure to attend class will result in an inability to achieve the objectives of the course. Excessive absence will result in loss of points for participation. Regular attendance and active participation are required for students to successfully complete the course.

### Assignments

We have weekly assignments, in-class exercises, and individual reports throughout the semester.

### Class project

There is a class project for each group. Each team will analyze a business opportunity potentially empowered or disrupted by Big Data and Artificial Intelligence. Further details of the projects will be provided in class.

### Grading

The grade of A is reserved for those who demonstrate extraordinary performance as determined by the instructor. The grade of A- is awarded only for excellent performance. The grades of B+ and B are awarded for good performance. The grades of B-, C+, C, and C- are awarded for adequate but substandard performance.

The grades of D+, D, and D- are not awarded at the graduate level. The grade of F indicates the student's failure to satisfactorily complete the course work. For Core/Foundation courses, the grade point average of the class should not exceed 3.35. For Elective courses, the grade point average should not exceed 3.45.

Your final grade for the course will be composed from the following items:

Class participation:	15%*1= 15%
Assignments:	5%*6 = 30%
Group presentation	10%*1= 10%
Quizzes:	5%*4 = 20%
Final project:	25%*1= 25%

The grade of A is reserved for those who demonstrate extraordinary performance as determined by the instructor. The grade of A- is awarded only for excellent performance. The grades of B+ and B are awarded for good performance. The grades of B-, C+, C, and C- are awarded for adequate but substandard performance. The grades of D+, D, and D- are not awarded at the graduate level. The grade of F indicates the student's failure to satisfactorily complete the course work. For Core/Foundation courses, the grade point average of the class should not exceed 3.35. For Elective courses, the grade point average should not exceed 3.45.

### Policy on Generative AI

Academic integrity is a cornerstone of the Carey Business School. Generative artificial intelligence (AI) tools such as ChatGPT are widely available, and these technologies present a number of exciting opportunities in the classroom. In this course, you may use generative AI tools on assignments and class projects. You may not use generative AI tools for any other assignments or assessments. Use of AI must be cited, and all professors have access to an AI indicator on "TurnItIn" which will let them know of the extent to which you likely used AI to complete an assignment. For guidance with referencing AI-generated content, please use the following:

[MLA Style Center](#)

[The Chicago Manual of Style Online](#)

[APA Style](#)

### Tentative Course Calendar

Week	Topic
1	Introduction to Course & Overview of AI Development
2	Simple Neural Network, Train a neural Network using forward and back propagation
3	Evaluate a model's performance, Human vs AI in decision making
4	Convolutional Neural Network
5	NLP, Word Embedding
6	Recurrent Neural Network, Long Short-term Memory Model, Attention Models
7	Large Language Models, Generative AI, Prompt Engineering
8	Responsible AI, Project presentation

Instructors reserve the right to alter course content and/or adjust the pace to accommodate class progress. Students are responsible for keeping up with all adjustments to the course calendar.

### Students with Disabilities - Accommodations and Accessibility

Johns Hopkins University values diversity and inclusion. We are committed to providing welcoming, equitable, and accessible educational experiences for all students. Students with disabilities (including those with psychological conditions, medical conditions and temporary disabilities) can request accommodations for this course by providing an Accommodation Letter issued by [Student Disability Services](#). Please request accommodations for this course as early as possible to provide time for effective communication and arrangements. For further information or to start the process of requesting accommodations, please contact [Student Disability Services](#) at the Carey Business School.

### Academic Ethics Policy

## Master Schedule

	Date	Teams present in class	In-class Quiz	Topics	Assignments	Assignment Due Date
1	1/23	N/A		Course introduction, Definition of AI, Turing Test, Overview of three AI technologies, Why AI now (three driving forces)	Assignment 1	1/29
2	1/30	N/A		Google Colab, Simple Neural Network, Forward and back propagation	Assignment 2	2/5
3	2/6	N/A	Quiz 1	Evaluate Model's performance, Human vs AI decision making	Assignment 3	2/12
4	2/13	Teams 1, 2	Quiz 2	Convolutional Neural Network	Assignment 4	2/19
5	2/20	Teams 3, 4	Quiz 3	Natural Language Processing, Word Embedding	Assignment 5	2/26
6	2/27	Teams 5, 6	Quiz 4	Recurrent Neural Network, Long Short-term Memory Models, Attention Models, Large Language Models	Assignment 6	3/5
7	3/6	Teams 7, 8		Generative AI, Prompt Engineering, Agentic AI		
8	3/13	All teams		Responsible AI	Project Presentation	3/13

30%

class participation 15%

10%

20%

25%

Class participation:  
Assignments:  
Group presentation  
Quizzes:  
Final project:

$$15\% * 1 = 15\%$$

$$5\% * 6 = 30\%$$

$$10\% * 1 = 10\%$$

$$5\% * 4 = 20\%$$

$$25\% * 1 = 25\%$$

Carey expects graduates to be innovative business leaders and exemplary global citizens. The Carey community believes that honesty, integrity, and community responsibility are qualities inherent in an exemplary citizen. The objective of the Academic Ethics Policy (AEP) is to create an environment of trust and respect among all members of the Carey academic community and hold Carey students accountable to the highest standards of academic integrity and excellence.

It is the responsibility of every Carey student, faculty member, and staff member to familiarize themselves with the AEP and its procedures. Failure to become acquainted with this information will not excuse any student, faculty, or staff from the responsibility to abide by the AEP. Please contact the [Office of Student Affairs](#) if you have any questions. For the full policy, please visit the [Academic Ethics Policy webpage](#).

### **Student Conduct Code**

The fundamental purpose of the Johns Hopkins University's regulation of student conduct is to promote and to protect the health, safety, welfare, property, and rights of all members of the University community as well as to promote the orderly operation of the University and to safeguard its property and facilities. Please contact the [Office of Student Affairs](#) if you have any questions regarding this policy. For the full policy, please visit the [Student Conduct Code webpage](#).

### **Student Success Center**

The Student Success Center offers assistance in core writing and quantitative courses. For more information, visit the [Student Success Center webpage](#).

### **Other Important Policies and Services**

Students are encouraged to consult the [Student Handbook and Academic Catalog](#) and [Student Services and Resources](#) for information regarding other policies and services.

### **Copyright Statement**

Unless explicitly allowed by the instructor, course materials, class discussions, and examinations are created for and expected to be used by class participants only. The recording and rebroadcasting of such material, by any means, is forbidden. Violations are subject to sanctions under the [Academic Ethics Policy](#).