# UCDAVIS
## GRADUATE SCHOOL OF MANAGEMENT

PREPARING INNOVATIVE LEADERS FOR GLOBAL IMPACT

**NEW COURSE**

**AI – Artificial Intelligence**

**Graduate School of Management**
**Department of Marketing**
**University of California - Davis**

## Fundamentals of Applied AI

## Winter Quarter 2025

MGB 491V 001 WQ 2025 (CRN: 30358)
MGP 491V 001 WQ 2025 (CRN: 30379)

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|---|---|
| **Instructor**: | Kay Peters, Visiting Professor of Marketing |
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| **Office Hours**: | Please arrange a meeting via email and give some advance notice. |

**Please note:**
**This is a 1-credit course comprising 10 hours of teaching in 4 sessions (2 days).**

## Why should you take it?

## Because no one should leave University today without

## Mastering the Fundamentals of Applied AI

## Some motivational quotes on AI – why you should enjoy the course :

"Artificial intelligence, deep learning, machine learning — whatever you're doing if you don't understand it — learn it. Because otherwise, you're going to be a dinosaur within three years."
**Marc Cuban, Entrepreneur and Investor**

"Artificial intelligence and generative AI may be the most important technology of any lifetime."
**Marc Benioff, chair, CEO, and co-founder, Salesforce**

"This next generation of AI will reshape every software category and every business, including our own. Although this new era promises great opportunity, it demands even greater responsibility from companies like ours."
**Satya Nadella, CEO Microsoft**

"I have not seen this level of engagement and excitement from customers, probably since the very, very early days of cloud computing."
**Dr Matt Wood, VP AI AWS**

"Today's dynamic technology and business landscape means every developer needs to be an AI developer. The innovations we're launching at SAP are supporting the developers at the heart of the AI revolution and providing them with resources they need to transform the way businesses run."
**Juergen Mueller, CTO SAP**

"AI will be the most transformative technology of the 21st century. It will affect every industry and aspect of our lives.
**Jensen Huang, CEO NVIDIA**

"AI will change the way we work and run our businesses in the same way that the introduction of the internet did."
**Richard Potter, CEO PEAK**

"AI has the power to unlock unprecedented productivity and innovation across all industries."
**Param Kahlon, CPO UiPath**

"Right now, people talk about being an AI company. There was a time after the iPhone App Store launch where people talked about being a mobile company. But no software company says they're a mobile company now because it'd be unthinkable to not have a mobile app. And it'll be unthinkable not to have intelligence integrated into every product and service. It'll just be an expected, obvious thing."

**Sam Altman, co-founder and CEO**

"We see the wave coming. Now this time next year, every company has to implement it — not even have a strategy. Implement it."
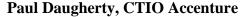
**Emad Mostaque, founder and CEO, StabilityAI**

"The playing field is poised to become a lot more competitive, and businesses that don't deploy AI and data to help them innovate in everything they do will be at a disadvantage."

**Paul Daugherty, CTIO Accenture**

"Harnessing machine learning can be transformational, but for it to be successful, enterprises need leadership from the top. This means understanding that when machine learning changes one part of the business — the product mix, for example — then other parts must also change. This can include everything from marketing and production to supply chain, and even hiring and incentive systems."

**Erik Brynjolfsson, Professor, Stanford Institute for Human-Centered AI**

# Course Description

AI is a transformational technology. Experts compare it to the steam engine, electricity, and the internet. Every activity that can be learned or is repetitive will be done by AI sooner or later. As such, AI will transform all industries, businesses, all functions of the firm, down to each job we currently have. No one will be spared, especially not white-collar workers. There are three strategic positions for you to be in: (1) being hit unprepared by the AI Tsunami, (b) riding the AI wave being able to implement AI solutions, or (c) being part of the AI Tsunami creating crowd.

This course provides you with a basic understanding of the fundamental concepts and structure of AI applications. We focus on the pillars of the frontier in AI developments so you can navigate any current and future AI application space We take you from basic architectural foundations to agent-based AI ensemble applications, something that most likely becomes applications standard only in 1.5 years from now.

The first day of the course will introduce to AI fundamentals, ending on the latest developments. On the second day we move to current hot AI applications, featuring various startups and AI applications across several business functions. We may solve 1-2 AI case studies and, if time permits, train you in some fundamentals of prompt engineering.

Equipped with this knowledge, you should be a hot asset for any company currently looking for people designing, implementing, and running AI applications that transform the business hiring you.

# Course Objectives

This course emphasizes the need for preparing yourself and your business for the future of AI enabled businesses. It aims to teach the basic principles involved in understanding and managing AI applications. The specific objectives are outlined below:

This course aims to provide you with a basic understanding of
- what AI is, including a brief history and evolution
- what the basic architecture of AI and its applications are,
- what types of prompts (incl. meta-levels of self-programming), AI algorithms, and data exist, and how various categorizations overlap,
- and how to combine all these components for business applications.
- Ethics concerns on AI.

This course will enable participants to develop their knowledge and skills to enhance their performance in an AI-driven business environment. As outlined above, virtually all firms need to deal with the transformational impact of AI, turning this course into an important aspect when pursuing any future management positions.

## Class Format and Administration

Classes are organized in the following way:

1. In-class lectures
2. In-class discussions
3. Industry Application Presentations and Discussion
4. Group Case Analysis & Group Case Presentations

   Classes consist of lectures, discussions, and case work. Lectures provide the concepts and tools. In-class discussions are based on the assigned reading material, lectures, and case work. The cases will furnish real-world examples of how concepts and tools are applied in practice. Additional information will be given in the first class (**do not miss it**).

## Course Requirements and Grading

The course requirements and their contribution to the overall grade are as follows:

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|---|---|
| **1. Individual Class Participation** | 50% |
| **2. Group Case Presentations** | 50% |

<span style="color:red">**Grading: Letter**</span>

### *Class Participation (50%)*
   Meaningful class interactions add a great deal to the learning experience. Hence, I consider class participation to be an important component of your education in this course. A lot of your learning about ideation and the creativity process will come from intensive class discussions – so, I expect that you have read all the articles assigned to each class prior to the class and come prepared to discuss your insights about and analysis of the articles. Additionally, feel free to go above and beyond just the class readings – bring articles that caught your attention, any prior experience you might have had with new product development also into the conversation. Conversations that enrich the class discussion are encouraged; at the same time I will discourage conversations that might veer the class off-track. Simply speaking in class without adding constructively to the class discussion will not merit any points. Finally, while I encourage you to voluntarily participate in the class discussion, also expect to be cold called from time to time.
<span style="color:red">**Please make sure to miss no more than 2 hours of class or your grade will B+ or lower.**</span>

## *Group Case Presentations (50%)*

As the course aims to enable participants to analyze realistic scenarios and subsequently devise and implement appropriate solutions, the team case work is key. Team memberships will hold for the entire course. Grading will be based on the analytics as well as the suggested solution, their presentation, and the team's contribution to class discussion.

Depending on the final size of the class, each group presentation will be limited to leave sufficient time for in-class discussion. All presentations (6-10 PPT slides) are due via Canvas at the following times:

**on Friday, Mar 7, 2025, at 11pm**.

## Class Rules

### *Academic Honor Code*

There are several individual level assignments in this course. You are expected to complete the assignments on your own, without help from your peers – i.e., you are not permitted to work with others on any aspect of the individually graded coursework. In case you have questions regarding the material or assignments, I'm available either in my office, by phone or email and will be happy to answer your questions.

Please read http://sja.ucdavis.edu/files/cac.pdf for details.

### *Use of Electronics in Class*

You are allowed to use your laptop/tablet in class – however this use is conditional. You cannot use your laptops for any other activity other than those pertaining to the class. Hence, surfing, emailing, chatting, facebook visits and other related activities are not allowed. If such activity is observed in class, then laptop privileges will be revoked – for the entire class. Smartphone/phone use is not allowed in class – you are welcome to step out of class, with my permission, if you need to answer a call.

## Required Course Material

*Text Pak I (Required)*
**No regular textbook is required**. However, there are a couple of good reasonably priced books as a start which are listed below. Required readings are slide collections and selected articles that will be distributed through Canvas before the classes. These collections are based on numerous books and articles that have been integrated for your convenience. For the lectures, an essence of these collections is used.

1.  Welcome to AI **[HBS, Book, USD 15]**
    (Shrier 2024)                                                      10731-PDF-ENG
2.  Prediction Machines **[HBS, Book, USD 15]**
    (Agraval, Gans, & Goldfarb 2022)                                   10598-PDF-ENG
3.  Fusion Strategy: How Real-Time Data and AI Will Power the Industrial Future
    **[HBS, Book, USD 17.5]**
    (Govindarajan & Venkatraman 2024)                                  10689-PDF-ENG

*Text Pak II (Required)*
4.  What Managers Should Ask About AI Models and Data Sets **[VPN]**
    (Hoerl 2023)                                                       SR0166-PDF-ENG
5.  The Working Limitations of Large Language Models **[VPN]**
    (Burtsev & Reeves 2023)                                            SR0157-PDF-ENG
6.  AI Doesn't Have to Be Too Complicated or Expensive for Your Business **[VPN]**
    (Ng 2021)                                                          H06HSP-PDF-ENG
7.  The (Surprisingly) Simple Economics of Artificial Intelligence **[VPN]**
    (Agrawal, Gans, & Goldfarb 2018)                                   ROT359-PDF-ENG
8.  Getting AI to Scale **[VPN]** (Foutaine, McCarthy, & Saleh 2021)   R2103H-PDF-ENG
9.  Artificial Intelligence and the Future of Work **[VPN]**
    (Hossein Jarrahi 2018)                                             BH914-PDF-ENG
10. Collaborative Intelligence: Humans and AI Are Joining Forces **[VPN]**
    (Wilson & Daugherty 2018)                                          R1804J-PDF-ENG
11. Building the AI-Powered Organization **[VPN]**
    (Foutaine, McCarthy, & Saleh 2019)                                 R1904C-PDF-ENG
12. Competing in the Age of AI **[VPN]** (Iansiti & Lakhani 2020)      R2001C-PDF-ENG
13. Ethical Implications of Artificial Intelligence, Machine Learning,
    and Big Data **[HBS]** (Zaric, Maclean, & Mann 2021)              W21095-PDF-ENG

Cases:
14. McCormick: Deploying AI in NPD **[HBS]**
    (Meister & Chandrasekhar 2021)                                     W25509-PDF-ENG
15. DBS' AI Journey **[HBS]** (Zhu, Zhu, & Wong 2024)                 625053-PDF-ENG
16. DBS Bank: A Tech Company Going All in on AI **[HBS]**
    (Miller, Davenport, & Bhattacharya 2023)                           056SMU-PDF-ENG
17. Supervised Machine Learning: An Experiential and Applied Session **[HBS]**
    (Gilleran & Gordon 2024)                                           BAB752-PDF-ENG

Via UCD Library:
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## Class Schedule

<u>Class 1 & 2     Mar 2            Su 9.30-12.30n & 1.30-3.30p            ZOOM</u>

### Part 1:    Conceptual Essentials
- **What is AI?**
- **A brief history and evolution**

- **Basic architecture of AI**
- **Types of**
  - **prompts (incl. meta-levels of self-programming),**
  - **AI algorithms,**
  - **and data exist,**
- **Various categorizations of AI & their overlap**
- **How to combine architecture components for business applications**

- **Ethical concerns on AI**

### Part 2:    Current AI Applications
- **AI startups across business functions – a selection**
- **AI business applications across industries – a selection**
  **(may spill over to 2nd day)**

### Introduction to Case Assignments

Class 3 & 4    Mar 9          Su 9.30-12.30n & 1.30-3.30p          ZOOM

## Part 3:    Application of Knowledge
- **Case 1: McCormick**
- **Case 2: DBS**

## Part 4:    AI & YOU
- **Prompt Engineering**
- **Supervised Machine Learning – An Experiential & Applied Session**

*Course Evaluations*

Statement on Accommodation

UC Davis is committed to educational equity in the academic setting, and in serving a diverse student body. All students who are interested in learning about how disabilities are accommodated can visit the Student Disability Center (SDC). If you are a student who requires academic accommodations, please contact the SDC directly at sdc@ucdavis.edu or 530-752-3184. If you receive an SDC Letter of Accommodation, submit it to your instructor for each course as soon as possible, at least within the first two weeks of a course.

Rights and Responsibilities

All participants in the course, instructor and students, are expected to follow the UC Davis Principles of Community, which includes affirmation of the right of freedom of expression, and rejection of discrimination. The right to express points-of-view without fear of retaliation or censorship is a cornerstone of academic freedom. A diversity of opinions with respectful disagreement and informed debate enriches learning. However, in this course, any expression or disagreement should adhere to the obligations we have toward each other to build and maintain a climate of mutual respect and caring.
You are expected to take UC Davis's Code of Academic Conduct as seriously as we do. You were given this code of conduct with explicit explanations of violations (e.g., plagiarism, cheating, unauthorized collaboration, etc.) and your responsibilities in regard to them during orientation, and you signed a statement affirming that you understand it. Academic conduct violations will not be tolerated, and your instructor will not hesitate to turn violators over to Student Judicial Affairs. If you are uncertain about what constitutes an academic conduct violation, please refer to the code linked above, contact your instructor, or refer to the Office of Student Judicial Affairs.
All material in the course that is not otherwise subject to copyright is the copyright of the course instructor and should be considered the instructor's intellectual property.

Safety and Emergency Preparedness

UC Davis has many resources to help in case of emergency or crisis. While reviewing campus Emergency Information, you may want to register for UC Davis Warn Me and Aggie Alert, which will give you timely information and instructions about emergencies and situations on campus that affect your safety. If there is an emergency in the classroom or in non-Davis locations, follow the instructions of your instructor.

Student Wellness

You deserve respect, and are encouraged to practice self-care so that you can remain focused and engaged; that might mean getting a drink of water, leaving to use the restroom, taking a moment to stretch, or doing something else you need to do to take care of yourself. Please be respectful of others by minimizing distractions when practicing self-care – especially in lab, field or studio settings where safety is imperative.

College life can be overwhelming at times but know that you are not alone if you're feeling stressed. For many of us, systems of oppression such as racism, sexism, heterosexism or cissexism may cause additional stress. Please remember to practice self-care and reach out for support if and when you need it.

You can visit Virtual UC Davis to find resources related to health and well-being, academics, basic needs (food and housing) and more.

Disclaimer

Of course, any unexpected events might require elements of this syllabus to change. Your instructor will keep you informed of any changes.