CUHK (SZ)

Course Outline

1. Course Identity

A. Course as listed in CUHK (SZ)

The information in this block should be exactly as approved by CUHK Senate. In case there are any differences, please explain in the table below.

Course code	MIS3011
Course title (English)	Advanced AI for Business: From Theories to Applications
Course title (Chinese)	面向商务实践者的高级人工智能：从理论到应用
Units	3
Description (English)	**Advanced AI for Business Practitioners: From Theories to Applications** is designed for those ready to explore the cutting-edge technology of artificial intelligence from a business perspective. The course spans 14 intricately designed weeks that merge theory with hands-on experience, unraveling AI's constituents, demonstrating the role of data and algorithms, diving into the world of machine learning and deep learning, and eventually exploring the ethics and regulations controlling AI. The course encapsulates real-world case studies, lab sessions, group activities, and many more engaging tools that ensure a comprehensive understanding of how AI can transform the business landscape. To enroll this course, students are required to have basic skills in coding and data analytics, e.g., basic knowledge in linear algebra, statistics, and the Python programming language.
Description (Chinese)	《面向商务实践者的高级人工智能：从理论到应用》是为那些准备从商业角度探索人工智能前沿技术的人精心设计的。这门课程总共持续 14 周，通过将理论与实践经验相结合，解析人工智能的核心组成部分，展示数据和算法的作用，深入机器学习、深度学习的世界，并最终探讨控制人工智能的伦理和规章制度。课程包括真实世界的案例研究、上机实验、小组活动等多种互动工具，让学生深入理解人工智能将如何改变商业环境。 学生需要具备基础的编程和数据分析技能：例如线性代数、统计学和 Python 编程语言的基础知识。

B. Corresponding course in CUHK

Please give details of the *closest* corresponding course in CUHK (as approved by CUHK Senate and listed in course list). If the course in SZ maps to more than one course in CUHK, please make multiple copies of the lock below.

Course code	
Course title (English)	
Course title (Chinese)	
Units	
Description (English)	
Description (Chinese)	

2. Prerequisites / Co-requisites

Please state prerequisites and co-requisites, in terms of courses in CUHK (SZ)* or any other requirements (e.g., having taken certain subjects in high school).

(* Because course codes may not yet be stable, please provide both course code and course tile.)

A. Prerequisites

Students are required to have basic skills in coding and data analytics. Basic knowledge in linear algebra, statistics, and the Python programming language is required for taking this course.

B. Co-requisites

No co-requisite.

3. Learning Outcomes

Upon successfully completing this course, students will be able to:

- Understand the core concepts and principles of AI and its various components like algorithms, data management, machine learning, neural networks, etc.
- Apply algorithmic thinking and programming skills in AI-based business solutions.
- Gain proficiency in hands-on use of data processing and analytic tools for AI-based business solutions.

- Understand the business implications and opportunities of AI.
- Evaluate the benefits and limitations of different AI solutions.
- Know the ethical considerations and potential risks associated with AI deployment.
- Apply AI concepts and technologies in solving complex business challenges with team-based projects.

4. Course syllabus

Course Meeting Times

Lectures: 1 session / week, 3 hours / session

Course Overview

Throughout the course, students will navigate through an AI journey that encapsulates lectures, in-class activities like debates, simulations, lab hours, guest lecturers, and much more. Students will need to complete biweekly programming assignments around AI algorithms, data parsing, business analytics, etc. We encourage in-class participation and interactions, and students will be rewarded for active engagement.

Commencing from Week 7, students will embark on a real-world business project where they will apply all AI concepts and techniques learned so far, providing them an unmatched opportunity to experience AI implementations in businesses firsthand. The project will be evaluated based on clarity, complexity, innovation, presentation, and real-world applicability. The project will be presented and evaluated in Week 14, assisting students in revising the entire course before the evaluations.

Through this intensively designed course, students will not only grasp the breadth and depth of AI but also its practical business applications, getting them ready to tackle real-world business challenges with AI.

5. Assessment Scheme

Component/ method	**% weight**
Class Participation	10%
Individual Assignments	30%
Exams	30%
Group Project	30%

6. Grade descriptor

Grade	Overall course
A	Excellent performance in all learning outcomes. Demonstrates a solid understanding of AI concepts and its practical implementation in business applications. Exhibits strong analytical skills in using AI algorithms and tools to solve business problems. Actively participates in class discussions and exercises.
A-	Excellent performance in majority learning outcomes. Demonstrates a solid understanding of AI concepts and its practical implementation in business applications. Exhibits strong analytical skills in using AI algorithms and tools to solve business problems. Actively participates in class discussions and exercises.
B+, B, B-	Substantial performance in all learning outcomes, or high performance in several areas that compensates for less satisfactory performance in others. Demonstrates a good knowledge of AI concepts and the ability to apply AI skills in business scenarios. Regular constructive participation in class discussions and exercises. Effective real-world project execution with slight need for improvement.
C+, C, C-	Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses. Shows some understanding of AI concepts and their implications in business. Partaking in class activities and discussions but may require additional guidance or improvement. Executed a functional real-world project but exhibits area(s) in need of improvement.

Grade	Overall course
D+, D	Barely satisfactory performance on a number of learning outcomes Demonstrates basic comprehension of AI tools and their usage in business scenarios. Shows limited or passive participation in class activities and discussions. Project execution meets minimum requirements but lacks substantial application or understanding of AI in business scenarios.
F	Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirements. Fails to demonstrate a basic understanding and application of AI concepts in the given business context. Little to no participation in class discussions and activities. Failure to deliver or unsatisfactory execution of the real-world project.

7. Feedback for evaluation

(1) A course questionnaire answered by every student after finishing all the lectures
(2) Informal feedback to instructor and/or teaching assistant
(3) Feedback from informal conversation over office hour and e-mail
(4) Correspondence with students after class

8. Reading

A. Required

No required textbooks.

B. Recommended

- Krohn, J., Beyleveld, G., & Bassens, A. (2019). *Deep Learning Illustrated.* Addison-Wesley Professional.
- Russell, S. & Norvig, P. (2021). *Artificial Intelligence: A Modern Approach (4th edition).* Pearson Education, Inc.
- Andrew Burgess (2018) *The Executive Guide to Artificial Intelligence: How to identify and implement applications for AI in your organization*. Springer.
- Davenport, T. H. (2018). *The AI advantage: How to put the artificial intelligence revolution to work.* MIT Press.

9. Course components

Activity	Hours/week
Lecture (in lab)	3

10. Indicative teaching plan

Lecture	Content/ topic/ activity
1	Course overview An overview of AI and its impact
2	Data and big data: the drivers of modern AI
3	Linear and logistic regression in business decision-making
4	Intro to deep learning: neural networks
5	Computer vision (CV) and business operations
6	Transformative role of Natural language processing (NLP) on businesses
7	Intro to AI Platforms Rapid AI Integration with MediaPipe
8	Intro to GenAI Open the black box of LLMs
9	From LLMs to Large Multi-Modal Models
10	Develop LLM-powered software for business
11	AI strategy and Managing AI
12	Advanced Topics on AI Business Applications
13	Course Review
14	Project Presentation

11. Implementation plan (2024–25)

The implementation plan may vary from year to year. Please indicate expected enrollment, and number of sections.

40~80 students for lecture (x 1)

12. Approval

Has the course title been included in the program submission approved by CUHK Senate? Are there any differences?

Yes. There is no difference.

Have the details (as in this document) been approved at School or other level in CUHK (SZ)?

Yes.

13. Any other information

No.

14. Version date

Version number	1
As of (date)	2025. 01.06

Please save file as XXXxxxx v-nnn yymmdd

XXXxxxx = course code, e.g., MAT1212

nn = version number, e.g., 001 for version 1

yymmdd = date of this version, e.g., 131210