

ENGE 3950 AI and its Application

1. Course Code: ENGE 3950

2. Title in English: AI and its Application

3. Course description

The objective of this course is to (a) provide an overview of a variety of Artificial Intelligence (AI) technologies, (b) enable students to evaluate AI technologies, and (c) facilitate students to apply AI technologies to identify key problems in their major field and/or explore potential solutions for those problems. It incorporates a hybrid approach combining lecture segments and hands-on activities so that students are able to have a better understanding of what AI is and how AI technologies have been used for diverse purposes. The first part of the course focuses on exploring various applications and simple programming codes in Python for text mining, web crawling, speech recognition, image/video creation, etc. In the second part, students work on developing a website where they introduce and discuss the problems and solutions of their interest, which are explored using AI technologies.

4. Learning outcomes

Expected student learning outcomes from this course are as follows:

- Students will develop a conceptual and functional understanding of AI;
- Students will operate a variety of AI-based applications and examine their features to evaluate their effectiveness in achieving specific purposes;
- Students will be able to apply AI technologies to identify/explore key problems/solutions in their major field;
- Students will be able to create a website where diverse AI techniques are used for investigating the problems/solutions of their choice.

5. Course syllabus

Topic	Contents/fundamental concepts
AI	This section focuses on AI as the simulation of human intelligence processed by machines.
Big data, corpus	This section presents an overview of the concepts of big data and corpora, and explores the advantages and disadvantages associated with them.
Text mining	This section focuses on the process of transforming unstructured text into structured data for efficient analysis.
Sentiment analysis	In this section, students will analyze text data in terms of its emotional tone.
Speech processing	This section focuses on AI technologies to convert spoken language into written text, and those to transform written text to spoken language.
Vibe coding for tool creation	This section discusses how to create a tool through vibe coding using a natural language.
Supervised learning and	This section introduces two core types of machine/deep learning, namely supervised learning and unsupervised learning, and explains how they differ in terms of data, learning goals, and typical applications.

unsupervised learning	
Machine learning and deep learning	This section explains the relationship between machine learning and deep learning, highlighting their main characteristics, differences, and common uses in data-driven problem solving.

6. Course components (Learning activities)

Lecture (hr) in /out class		Tutorial (hr) in /out class	
2	0	1	0
M	NA	M	NA

Note. M: Mandatory activity in the course; NA: Not applicable

7. Assessment type, percentage and rubrics

Course requirements and grading breakdown

Requirement	Weight
Participation and contribution to class activity and discussion	20%
Presentation	20%
Exam	20%
Project	40%

Assessment rubric and guideline

The quality of students' work will be evaluated using letter grades based on the following criteria:

- (1) intellectual capacity;
- (2) analytical power and reasoning;
- (3) knowledge of proposed research study;
- (4) imagination and originality;
- (5) skills of writing and argumentation;
- (6) ability for conducting scholastic research;
- (7) capacity for independent work; and
- (8) reliability and sense of responsibility.

- **Participation and contribution to class discussion (20%):**

Students are expected to attend class and participate in the learning activities (e.g., hands-on activities, discussions, mini-tasks) conducted in classes and tutorial sessions.

- **Presentation (20%):**

For this assignment, students will work in groups (to be confirmed) to have a short presentation that (a) showcases a movie, music video, or drama clip related to AI and (b) explains how the

depicted AI concepts can be applied to tackle a problem/issue related to applied linguistics, literature, and/or education.

- **Exam (20%):**
The final exam assesses students' understanding of the concepts covered in the course.
- **Project (40%):**
Students will create a website where diverse AI techniques are used for investigating the problem(s)/solution(s) of their choice. The topic(s) chosen should have clear and meaningful implications to applied linguistics, literature, and/or language education. Students will submit the website's link and a PDF of the webpage that demonstrates their AI-based approach to problem-solving. The specific guidelines for this requirement will be shared in due time.

Note: Auditors are expected to fully participate in all classes and complete the presentation assignment so that they can both contribute to and benefit from the collaborative learning environment.

8. Required readings

Textbooks

- Boden, M. A. (2018). *Artificial intelligence: A very short introduction*. Oxford University Press.
- Russell, S., & Norvig, P. (2022). *Artificial Intelligence: A Modern Approach (4th edition)*. Hoboken, NJ: Pearson.

Articles

- Reppen, R., & Simpson-Vlach, R. (2010). Corpus Linguistics. In *An introduction to applied linguistics* (pp. 91-108). Routledge.
- Posts online

Notes: You can find most of the required reading resources on our library's website, and any exceptions will be made available on Blackboard. The reading material may be changed/updated to ensure that students have access to the most current information.

9. Feedback for evaluation

Students will receive feedback on their assignments. They can also contact the instructor via diverse channels, such as emails and meetings.

10. Course schedule

Week	Date	Topic	Reading	Remarks
1	9/8	Introduction to the course		
2	9/15	Artificial intelligence	Boden (2018): Chapter 1	
3	9/22	Big data, corpus construction  Create your own corpus from the web	Reppen & Simpson-Vlach (2010) → Blackboard	
4	9/29	Guide to presentation Group formation and discussion Guide to project		

		Website creation  Create your own questionnaire based on your research question(s)		
5	10/6	Text mining  Analyze your questionnaire data using text mining techniques	https://orangedatamining.com/docs/	Bring your questionnaire data to tutorial
6	10/13	Sentiment analysis  Analyze your literature data using sentiment analysis	<i>Boden (2018): Chapter 3 (optional)</i>	Bring some data for sentiment analysis to tutorial
7	10/20	Student presentations: AI in movies		
8	10/27	Speech processing (in Python)  Project idea development	https://medium.com/@maftun.hasimli/basic-principles-of-speech-processing-d97dca031d38 (until 2.3.2.1 Spectrogram)	
9	11/3	Question answering Vibe coding for tool creation  Create questions and answers using generative AI		
10	11/10	Supervised and unsupervised learning Image data analysis	https://medium.com/@yennhi95zz/1-supervised-vs-unsupervised-machine-learning-understanding-the-differences-83623055b40a <i>Russell & Norvig (2020): Chapter 25 (optional)</i>	Bring your earbuds to class; come to Digital Scholarship Lab at Library
11	11/17	Machine learning and deep learning  Philosophical questions regarding AI	https://medium.com/intro-to-artificial-intelligence/deep-learning-series-1-intro-to-deep-learning-abb1780ee20	

			(optional)	
12	11/24	Catch up Philosophy, ethics, and safety of AI Website improvement  Website presentations	Russell & Norvig (2020): Chapter 27	Be ready with your 3-min website presentation during tutorial
13	12/1	Website finalization		Project due on 12/6
14	TBA	Exam Time: TBA Place: TBA		

11. Contact details for teacher

Professor/Lecturer/Instructor:	
Name:	Haerim Hwang
Office Location:	Fung King Hey 325
Telephone:	3943 7020
Email:	haerimhwang@cuhk.edu.hk
Teaching Venue:	
Website:	NA
Other information:	NA

12. Details of course website

Blackboard will be used for sharing resources.

13. Academic honesty and plagiarism

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at <http://www.cuhk.edu.hk/policy/academichonesty/>.

With each assignment, students will be required to submit a signed [declaration](https://www.cuhk.edu.hk/policy/academichonesty/Eng_html_files_(2013-14)/p10.htm) ([https://www.cuhk.edu.hk/policy/academichonesty/Eng_html_files_\(2013-14\)/p10.htm](https://www.cuhk.edu.hk/policy/academichonesty/Eng_html_files_(2013-14)/p10.htm)) that they are aware of these policies, regulations, guidelines and procedures.

- In the case of group projects, all members of the group should be asked to sign the declaration, each of whom is responsible and liable to disciplinary actions, irrespective of whether he/she has signed the declaration and whether he/she has contributed, directly or indirectly, to the problematic contents.
- For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment.
- Students are fully aware that their work may be investigated by AI content detection software to determine originality.

- Students are fully aware of the AI approach(es) adopted in the course. In the case where some AI tools are allowed, students have made proper acknowledgment and citations as suggested by the course teacher.

Assignments without a properly signed declaration will not be graded by teachers.

Only the final version of the assignment should be submitted via VeriGuide.

The submission of a piece of work, or a part of a piece of work, for more than one purpose (e.g. to satisfy the requirements in two different courses) without declaration to this effect shall be regarded as having committed undeclared multiple submissions. It is common and acceptable to reuse a turn of phrase or a sentence or two from one's own work; but wholesale reuse is problematic. In any case, agreement from the course teacher(s) concerned should be obtained prior to the submission of the piece of work.

The copyright of the teaching materials, including lecture notes, assignments and examination questions, etc., produced by staff members/ teachers of The Chinese University of Hong Kong (CUHK) belongs to CUHK. Students may download the teaching materials produced by the staff members/ teachers from the Learning Management Systems, e.g. Blackboard, adopted by CUHK for their own educational use, but shall not distribute/ share/ copy the materials to a third-party without seeking prior permission from the staff members/ teachers concerned.

14. Use of Generative Artificial Intelligence (AI) Tools in Teaching, Learning and Assessment

Approach 3 - Use only with explicit acknowledgement

Students may use some AI tools in some class activities and assignments on the condition that they make explicit acknowledgement and proper citations of the input from AI tools.

Acknowledging support from AI tools

Students are required to acknowledge all functional uses of a generative AI tool and cite it when they paraphrase, quote, or incorporate into their own work any content (whether it is text, image, data, or other format) that was created by it.

- An example of acknowledgement
I acknowledge the use of (name of AI tool – e.g. ChatGPT (<https://chat.openai.com/>)) to (specify the support, e.g. plan my essay, generate some ideas for the content, ask for examples of data collection instruments, get the dates of historical events, etc.).
- An example of citation
OpenAI. (2023). *ChatGPT* (Mar 20 version). <https://chat.openai.com/chat>
- An example of including texts generated by an AI tool in their work
*The following text was generated by an AI tool / language model (ChatGPT):
[Insert the text generated by ChatGPT here.]*
- An example of including texts generated by an AI tool and the prompts that were used to elicit the text from the AI tool
*[The prompt], as generated by an AI language model (ChatGPT):
[Insert the text generated by ChatGPT in response to the prompt.]*

Students should clarify with the course teacher and obtain permission if necessary when in doubt.

See <https://libguides.lib.cuhk.edu.hk/c.php?g=917899&p=6975970> for using AI information responsibly for your assignments!

15. Course grade descriptors

Grade A / Excellent : Outstanding performance on ALL learning outcomes.

Demonstrates the ability to synthesize and apply the principles or skills learned in the course in a manner that would surpass the normal expectations at this level and typical of standards that may be common at higher levels of study. The 'A' grade should be reserved for truly excellent work that exceeds the level expected for the majority of students and are expected to be achieved only by a small minority

Grade A- / Very Good : Generally outstanding performance on ALMOST ALL learning outcomes.

Demonstrates the ability to synthesize and apply the principles or skills learned in the course in a manner that would fully fulfill the normal expectations at this level and occasionally reaches standards that may be common at higher levels of study.

Grade B+ / Good (Plus): HIGH performance on all learning outcomes, OR HIGH performance on some learning outcomes which compensates WELL for slightly less satisfactory performance on others, resulting in overall substantial performance.

Demonstrates the ability to apply WELL the principles or skills learned in the course in a comprehensive manner that would sufficiently fulfill the normal expectations at this level WELL.

Grade B / Good: SUBSTANTIAL performance on all learning outcomes, OR SUBSTANTIAL performance on some learning outcomes which compensates for slightly less satisfactory performance on others, resulting in overall substantial performance.

Demonstrates the ability to apply the principles or skills learned in the course in a MORE COMPREHENSIVE manner that would sufficiently fulfill the normal expectations at this level.

Grade B- / Good (Minus): GOOD performance on all learning outcomes, OR GOOD performance on some learning outcomes which compensates for slightly less satisfactory performance on others, resulting in overall substantial performance.

Demonstrates the ability to apply the principles or skills learned in the course in a COMPREHENSIVE manner that would sufficiently fulfill the normal expectations at this level.

Grade C+ / Fair (Plus): VERY SATISFACTORY performance on the majority of learning outcomes.

Demonstrates the ability to apply the principles or skills learned in the course in a SOMEWHAT SUSTAINED manner that would meet the basic requirement at this level.

Grade C / Fair : SATISFACTORY performance on the majority of learning outcomes.

Demonstrates the ability to partially apply the principles or skills learned in the course in a manner that would meet the basic requirement at this level.

Grade C- / Fair (Minus): SOMEWHAT SATISFACTORY performance on A NUMBER OF learning outcomes.

Demonstrates the ability to SOMEWHAT apply the principles or skills learned in the course in a manner that would meet the BARE basic requirement at this level.

Grade D+ / Pass (Plus): BARELY SATISFACTORY performance on a A FEW learning outcomes.

Addresses the course inadequately by meeting the basic requirement at this level only in some areas while responding minimally with possibly tangential content in others.

Grade D / Pass: ALMOST BARELY satisfactory performance on VERY FEW learning outcomes.

Addresses the course inadequately by meeting the basic requirement at this level only in very few areas while responding very minimally with possibly tangential content in others.

Grade F / Failure : Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirements.

Fails to address the course and likely does not understand what the course requires. In other words, the work completely misses the point.