The Hong Kong University of Science and Technology

UG Course Syllabus (Spring 2025-26)

[Course Title] Introduction to Artificial Intelligence

[Course Code] COMP 2211

[No. of Credits] 3 credits

[Any pre-/co-requisites] (COMP 1021 AND COMP 1028) OR COMP 1023

Name: [Instructor(s) Name] TSOI Yat Chat; XIAO Huiru

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Office Hours: [Specify Office Hours and Location] TBD

Course Description

[Briefly describe the course content, key topics or themes, objectives, methods of instruction, e.g., lectures, discussions, projects].

This course provides a gentle introduction to artificial intelligence (AI), and emphasizes hands-on practical experiences with Python and AI software tools to explore AI applications. Interesting applications that have been covered in previous class offerings include, but are not limited to, medical diagnosis, predictions of customer behaviour and user attitudes, character recognition, spam mail detection, text and image classifications and recognitions, sentiment analysis, and retinal vessel segmentation. The course also explores recent advances and discusses the history and ethics of AI. Only for students in their first and second year of study or those with approval from instructor by applying requisite waiver.

List of Topics

1. Brief history of AI
2. Search and problem solving
3. Knowledge representation
4. Probabilistic reasoning
5. Machine learning
6. Computer vision and image processing
7. Speech and language processing
8. Robotics
9. Social and ethical implications of AI
10. Potential and limitations

Keyword Syllabus

1. A brief history of AI
2. Advanced Python for AI
3. Naïve Bayes

4. K-nearest neighbors
5. K-means clustering
6. Perceptron and multi-layer perceptron
7. Fundamentals of image processing
8. Convolutional neural networks
9. Minimax and alpha-beta pruning
10. Artificial intelligence ethics

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. Demonstrate understanding of the historical perspective and development of artificial intelligence (AI).

2. Demonstrate understanding of the basic elements of AI thinking.

3. Demonstrate proficiency in applying basic principles and techniques of AI and using AI software tools to solve problems in a range of applications.

4. Demonstrate awareness of the social and ethical implications as well as potential and limitations of AI.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessment Task	Contribution to Overall Course grade (%)
Laboratory exercises	10%
Programming assignments	30%
Midterm examination	20%
Final examination	40%

Assessments:

[List specific assessed tasks, exams, quizzes, their weightage, and due dates; perhaps, add a summary table as below, to precede the details for each assessment.]

Assessment Task	Contribution to Overall Course grade (%)	Due date
Lab 2 #	2%	Around mid-March *
Lab 4 #	2%	Around end-March *
Lab 6 #	2%	Around mid-April *
Lab 8 #	2%	Around end-April *
Lab 9 #	2%	Around early-May *
Programming Assignment 1	15%	Around early-April *
Programming Assignment 2	15%	Around early-May*
Mid-Term	20%	
Final examination	40%	

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

Mapping of Course ILOs to Assessment Tasks

[add to/delete table as appropriate]

Assessed Task	Mapped ILOs	Explanation
Lab 2	ILO2, ILO3	The labs and programming assignments assess students' ability to understand the basic elements of AI thinking (ILO2) and to demonstrate proficiency in applying the basic principles and techniques of AI, as well as using AI software tools to solve problems in a variety of applications (ILO3).
Lab 4	ILO2, ILO3	
Lab 6	ILO2, ILO3	
Lab 8	ILO2, ILO3	
Lab 9	ILO2, ILO3	
Programming Assignment 1	ILO2, ILO3	
Programming Assignment 2	ILO2, ILO3	
Midterm Exam	ILO1, ILO2, ILO3, ILO4	The exams assess students' ability to demonstrate an understanding of the historical perspective and development of AI (ILO1), to understand the basic elements of AI thinking (ILO2), to demonstrate proficiency in applying the basic principles and techniques of AI and using AI software tools to solve problems in a range of applications (ILO3), and to be aware of the social and ethical implications, as well as the potential and limitations of AI (ILO4).
Final Exam	ILO1, ILO2, ILO3, ILO4	

Grading Rubrics

[Detailed rubrics for each assignment will be provided. These rubrics clearly outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.]

Final Grade Descriptors:

[As appropriate to the course and aligned with university standards]

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good Performance	Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal Pass	Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic

		judgments. Benefits from the course and has the potential to develop in the discipline.
F	Fail	Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.

Course AI Policy

[State the course policy on the use of generative artificial intelligence tools to complete assessment tasks.]

Generative artificial intelligence tools like ChatGPT or similar software are not allowed for your labs and programming assignments.

Communication and Feedback

Assessment marks for individual tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include details about test cases and common errors. Students who have further questions about the feedback, including marks, should consult the instructor within five working days after receiving the feedback.

Resubmission Policy

[If applicable, explain the policy for resubmitting work or reassessment opportunities, including conditions and deadlines.]

No resubmission will be accepted unless accompanied by prior arrangement with reasonable situations and supporting documents.

Required Texts and Materials

[List required textbooks, readings, and any other materials]

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

[Optional] Additional Resources

[List any additional resources, such as online platforms, library resources, etc.]

Reference books

Hadelin de Ponteves. **AI Crash Course**: A fun and hands-on introduction to machine learning, reinforcement learning, deep learning, and artificial intelligence with Python. Packt Publishing. 2019.

Denis Rothman, Matthew Lamons, Rahul Kumar, Abhishek Nagaraja, Amir Ziai, and Ankit Dixit. **Python: Beginner's Guide to Artificial Intelligence**: Build applications to intelligently interact with the world around you using Python. Packt Publishing. 2018.

Prateek Joshi, **Artificial Intelligence with Python**: Build real-world artificial intelligence applications with Python to intelligently interact with the world around you. Packt Publishing. 2017.

Sandipan Dey, **Python Image Processing Cookbook**. Packt Publishing. 2020.