

The Hong Kong University of Science and Technology

UG Course Syllabus (Fall 2026-27)

Course Title: Machine Learning

Course Code: COMP4211

No. of Credits: 3

Prerequisite(s): COMP 2211 AND (ELEC 2600 OR IEDA 2520 OR IEDA 2540 OR MATH 2411 OR MATH 2421 OR MATH 2431)

Exclusion(s): COMP 5212

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Office Hours: on appointment

Course Description

This course provides a comprehensive coverage of the machine learning field. It introduces the foundations of machine learning, such as optimization, regularization, and generalization. It covers several traditional machine learning algorithms and various types of neural networks, such as feedforward, convolutional, recurrent, and transformer models, as well as their applications to computer vision, natural language processing, and generative modelling. The course also includes selected advanced topics.

Topics to be covered

- Introduction to machine learning
- Supervised learning
 - deep models: multilayer perceptron, convolutional neural networks, recurrent networks
 - traditional supervised learning models: naive Bayes classifiers, decision trees
- Unsupervised learning
 - clustering, principal component analysis, generative models

Intended Learning Outcomes (ILOs)

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

1. Understand issues involved in learning from data and the major types of machine learning tasks.
2. Explain the principles underlying a variety of machine learning algorithms.
3. Apply a variety of machine learning algorithms to data.
4. Evaluate and compare the performance of different machine learning algorithms according to common performance criteria.

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.

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
1 assignment	10%	23/11/2026
3 quizzes	30%	30/9/2026, 26/10/2026, 25/11/2026
Final examination	60%	Dec 2026

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

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
In-class quizzes	ILO1, ILO2	Understand issues involved in learning from data and the major types of machine learning tasks; Explain the principles underlying a variety of machine learning algorithms
Programming assignments	ILO1, ILO2, ILO3, ILO4	Understand issues involved in learning from data and the major types of machine learning tasks; Explain the principles underlying a variety of machine learning algorithms; Apply a variety of machine learning algorithms to data; Evaluate and compare the performance of different machine learning algorithms according to common performance criteria
Written assignments	ILO1, ILO2, ILO3	Understand issues involved in learning from data and the major types of machine learning tasks; Explain the principles underlying a variety of machine learning algorithms; Apply a variety of machine learning algorithms to data
Examinations	ILO1, ILO2	Understand issues involved in learning from data and the major types of machine learning tasks; Explain the principles underlying a variety of machine learning algorithms

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	[Example: 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	[Example: 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	[Example: 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	[Example: 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	[Example: 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

Students must clearly state and cite when and how they used AI in their assignments

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include [specific details, e.g., strengths, areas for improvement]. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission Policy

N/A

Required Texts and Materials

N/A

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

N/A