The Hong Kong University of Science and Technology

UG Course Syllabus (Spring 2025)

Machine Learning

COMP 4211

3 credits

Pre-requisites: COMP 3211 AND (ELEC 2600 OR IEDA 2520 OR IEDA 2540 OR MATH 2411 OR MATH 2421 OR MATH 2431)

Exclusion: COMP 5212

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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.

Assessments:

Assessment Task	Contribution to Overall Course Grade (%)
In-class quizzes	10
Programming assignments	20
Written assignments	15
Group project	15
Final examination	40

Reference Books and Materials

- Ethem Alpaydin (2020). *Introduction to Machine Learning*. Fourth Edition. MIT Press.
- Ian Goodfellow, Yoshua Bengio, and Aaron Courville (2016). *Deep Learning*. MIT Press.
- Kevin P. Murphy (2022). *Probabilistic Machine Learning: An Introduction*. MIT Press.
- Aston Zhang, Zachary C. Lipton, Mu Li, and Alexander J. Smola (2021). *Dive into Deep Learning*. Cambridge University Press.
- Other assigned reading materials.