

The Hong Kong University of Science and Technology

UG Course Syllabus

Course Title: Fundamentals of Artificial Intelligence

Course Code: COMP3211

No. of Credits: 3-credit

Any pre-/co-requisites: COMP 2011 OR COMP 2012 OR COMP 2012H

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Course Description

Foundations underlying design of intelligent systems. Relations between logical, statistical, cognitive, biological paradigms; basic techniques for heuristic search, theorem proving, knowledge representation, adaptation; applications in vision, language, planning, expert systems.

Topics

Introduction to AI

Machine Learning

- Overview, Neural Network, Generalization, Cross-validation, Unsupervised learning

Problem-solving by search

- Uninformed Search, Informed Search, Constraint Satisfaction

Markov Decision Processes and Reinforcement Learning

Games

- minimax, Alpha-beta pruning

Probabilistic Reasoning

Logic

- Propositional logic, First-order logic

AI Applications

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
3 assignments	20%
Midterm	25%
Final Exam	55%
Total	100%

Required Texts and Materials

N/A

[Optional] Additional ResourcesReference books

N. Nilsson. Artificial Intelligence: A New Synthesis. Morgan Kaufmann Publishers, Inc., 1998.

S. Russell and P. Norvig. Artificial Intelligence: A Modern Approach. Second Edition. Prentice Hall, 2003.

Y. Shoham and K. Leyton-Brown. Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations. Cambridge University Press (December 15, 2008)

I. Goodfellow and Y Bengio and A Courville. Deep Learning. MIT Press 2016.

R. Sutton and A. Barto. Reinforcement Learning: An Introduction. 2nd Edition. MIT Press, Cambridge, MA, 2018. (<http://www.incompleteideas.net/book/the-book-2nd.html>)