

HONG KONG BAPTIST UNIVERSITY

COURSE OUTLINE

1. COURSE TITLE

Artificial Intelligence

2. COURSE CODE

COMP7015

3. NO. OF UNITS

3 Units

4. OFFERING DEPARTMENT

Master of Science in Data Analytics and Artificial Intelligence

5. PREREQUISITES

Nil

6. MEDIUM OF INSTRUCTION

English

7. AIMS & OBJECTIVES

To describe the fundamentals concepts, learning models, and techniques in artificial intelligence (AI). To give students practical insights into the current development of the field.

8. COURSE CONTENT

I. Introduction to AI

- History
- Applications
- Prospect

II. Search

- Uninformed search
- Heuristic search
- Constraint satisfaction search

III. Knowledge Representations and Reasoning

- Propositional and predicate logic
- Other representation techniques
- Uncertainty knowledge and reasoning

IV. Basics of Statistical Machine Learning

- Linear regression and logistic regression
- Overfitting and regularization techniques
- Decision tree learning algorithms
- Evaluating hypotheses

V. Artificial Neural Networks and Deep Learning

- Deep feedforward networks
- Regularization for deep learning
- Convolutional networks
- Sequence modeling

VI. Bayesian Learning

- Maximum likelihood and least-squared error hypotheses
- Minimum description length principle
- Bayes optimal classifier and Gibbs algorithm
- Bayesian belief networks

VII. Evolutionary Computation

- Genetic algorithms
- Hypothesis space search
- Genetic programming
- Models of evolution and learning

VIII. Reinforcement Learning

- Q-learning
- Temporal difference learning
- Relationship to dynamic programming

9. COURSE INTENDED LEARNING OUTCOMES (CILOs)

CILO	By the end of the course, students should be able to:
CILO 1	Explain the capabilities, strengths and limitations of various AI techniques
CILO 2	Explain various AI algorithms and their applications
CILO 3	Describe learning models and algorithms
CILO 4	Apply selected AI algorithms to solve real world problems
CILO 5	Understand complex ideas and relate them to specific situations

10. TEACHING & LEARNING ACTIVITIES (TLAs)

CILO alignment	Type of TLA
1-5	Students will learn the AI principles and techniques in lectures.
3-5	Students will work on assignments to enhance the understanding of AI ideas, and acquire hands-on experience on a mini project.

11. ASSESSMENT METHODS (AMs)

Type of Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
Continuous Assessment	50 %	1-5	Written and programming assignments, quiz/test and hands-on mini-project will be used to evaluate students' understanding of basic concepts and to assess their ability to apply AI ideas and learning algorithms to solve real world problems
Examination	50 %	1-5	Examination will be used to assess students' overall understanding of various AI algorithms, their applications, as well as their capabilities, strengths and limitations.

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