

The Hong Kong University of Science and Technology

UG Course Syllabus

Course Title: Exploring Artificial Intelligence

Course Code: COMP 2211

No. of Credits: 3 credits

Pre-requisites: COMP 1021 OR COMP 1029P

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Course Description

This course aims to give a gentle introduction to the basic elements of artificial intelligence (AI) through understanding examples from various applications and hands-on experimentation using AI software tools. In addition to covering the technical aspect of AI through such topics as search and problem solving, knowledge representation, probabilistic reasoning, machine learning, computer vision and image processing, speech and language processing, and robotics, this course will also study the historical perspective, social and ethical implications, as well as potential and limitations of AI.

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

Assessments:

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

Additional ResourcesReference 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.