COMP7015 Artificial Intelligence **Semester 1, 2024–25**

Course Information Sheet

Instructor: Dr. Kejing Yin August 31, 2024

1 Course Descriptions

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

This course covers a wide range of AI algorithms, including search, machine learning, deep learning, and reinforcement learning. After taking this course, students are expected to be able to 1) explain the capabilities, strengths and limitations of various AI techniques, 2) explain different AI algorithms and their applications, and 3) select suitable AI algorithm and apply it to solve real world problems.

2 General Information

- INSTRUCTOR:
  - Dr. Kejing Yin (Department of Computer Science; cskjyin@comp.hkbu.edu.hk)
- TEACHING ASSISTANTS:
  - Mr. LI Ruiqi (Department of Computer Science; csrqli@comp.hkbu.edu.hk)
  - Mr. CHI Pinzhen (Department of Computer Science; cspzchi@comp.hkbu.edu.hk)
- CLASS TIME & VENUES:
  - Every Friday 6:30 pm – 9:20 pm
  - Classroom: LT3 (SCT503, 5/F, Cha Chi Ming Science Tower, Ho Sin Hang Campus)
- ONLINE LEARNING & COMMUNICATION PLATFORM:
  - Learning materials and assignments will be posted in Moodle: `https://buelearning.hkbu.edu.hk/course/view.php?id=111847`
  - Course-related discussion and Q&A can be posted in Piazza: `https://piazza.com/hkbu.edu.hk/fall2024/comp7015`
- OFFICE HOURS (for Q&A):
  - Venue: RRS732, Sir Run Run Shaw Building, Ho Sin Hang Campus
  - Instructor office hour: every Wednesday 2 – 4 pm, from Sep. 11 to Nov. 27, except public holidays.
  - TA office hours (for programming questions): every Thursday 2 – 4 pm, from Sep. 19 to Nov. 21.
  - Other time or Q&A over zoom: email / Piazza message for appointment.
- LAB SESSIONS:
  - Lab Instructor: Mr. CHENG Kenny Kam Kong (Department of Computer Science)
  - Lab Location: FSC 8/F (Fong Shu Chuen Library, Ho Sin Hang Campus)
  - Four offline lab sessions will be delivered on Oct. 5, Oct. 26, Nov. 2, and Nov. 16.
  - Lab sessions will be divided to two identical sections due to limited seats in the lab.
    - Section 1: 2:00 pm – 3:45 pm (Capacity: 80 PCs);
    - Section 2: 4:00 pm – 5:45 pm (Capacity: 80 PCs).
- COURSE FEEDBACK:
  - Share your feedback with the instructor team (anonymous to instructors): `https://hkbu.questionpro.com/comp7015-feedback`

3 Assessment

1) Assignments 20%
2) In-class Quiz 5%
3) Course Project 25%
4) Examination 50%

Late Submission Policy

- Late submission of assignments are subject to grade penalties. For each 6 hours late, 12.5% of the assignment's grade will be deducted. *Example: If one scores* 90 *for an assignment, but it is overdue for 5 minutes, a penalty of* 11.25 *scores will be deducted.*
- For the course project, late submissions are not allowed. All late submissions will receive zero scores.

4 Course Plans

The following schedules are subject to change depending on the learning progress.

Week	Lecture and Assignments	Lab	Reading
Part I: Classic AI for Problem-Solving and Reasoning			
1	Sep. 6: Intro to AI & Uninformed Search		[1, §1, 3]
2	Sep. 13: Informed Search & CSPs *WA 1 release (due: 11:59am, Sep. 27)*		[1, §3, 4, 6]
3	Sep. 20: Adversarial Search and Games		[1, §5]
4	Sep. 27: Knowledge Representation and Reasoning		[1, §7–9]
Part II: Statistical Machine Learning			
5	Oct. 4: Basics of Statistical Machine Learning *PA 1 release (due: 11:59am, Oct. 18)*	Oct. 5: Solving Problems Using Search	[6, §3, 4]
6	Oct. 11: No class (Chung Yeung Fesival)		
7	Oct. 18: **In-class Quiz**		
8	Oct. 25: Decision Trees and Naive Bayes Classifier	Oct. 26: Machine Learning with Scikit-learn	[6, §14]
Part III: Deep Learning, Reinforcement Learning, and Generative AI			
9	Nov. 1: Basics of Deep Learning	Nov. 2: Getting Started with PyTorch	[4, §6–8]
10	Nov. 8: Deep Learning for Computer Vision *PA 2 release (due: 11:59am, Nov. 22)*		[4, §9, 12]
11	Nov. 15: Deep Learning for Language Modeling	Nov. 16: Using Pre-trained Models in PyTorch	[4, §10, 12]
12	Nov. 22: Basics of Reinforcement Learning *WA 2 release (due: 11:59am, Dec. 6)* *Project submission due (11:59am, Nov. 22)*		[1, §22]
13	Nov. 29: Generative AI Methods and Applications		

5 Important Notes

- In order to pass this course, you need to score at least 30% for the final examination and the group project.
- Discussions on course materials are encouraged. However, *you must write the solutions to the assignments and projects* ***on your own*** *and understand them fully.*
- Lending and borrowing assignment or project solutions are both regarded as dishonest behaviors and are subject to heavy penalty and disciplinary actions.
- All assignments and project reports must be written in your own words. Coping and pasting from books, lecture notes, Web resources, and your work submitted to other courses constitutes plagiarism, and are subject to heavy penalty and disciplinary actions.
- University policies for using generative AI tools: `https://securedoc.hkbu.edu.hk/hkbuOnly/ics/integration/GenAIPrinciples.pdf`
- University guidelines for academic integrity: `https://ar.hkbu.edu.hk/quality-assurance/university-policy-and-guidelines/academic-integrity`

- The University staunchly upholds the principles of academic integrity. As one part of HKBU's effort to prevent plagiarism, the software Turnitin is used to compare all assignments against multiple sources whenever appropriate. A report on each assignment is generated that includes a percentage similarity and links to specific similar sources. Turnitin does not conclusively prove whether or not an assignment is plagiarized — the faculty will make this determination.

References

[1] Stuart Russell and Peter Norvig. *Artificial Intelligence, A Modern Approach*. Prentice Hall, 4th Edition, 2020.

[2] Michael Negnevitsky. *Artificial Intelligence: A Guide to Intelligent Systems*. Addison Wesley, 3rd Edition, 2011.

[3] Vladimir N. Vapnik. *Statistical Learning Theory*. Wiley, 1998.

[4] Ian Goodfellow, Yoshua Bengio and Aaron Courville. *Deep Learning*. MIT, 2016.

[5] Tom M. Mitchell. *Machine Learning*. McGraw-Hill 1997.

[6] Christopher M. Bishop. *Pattern Recognition and Machine Learning*. Springer, 2006.

[7] Kevin P. Murphy. *Machine Learning: A Probabilistic Perspective*. MIT, 2012.

[8] Trevor Hastie, Robert Tibshirani and Jerome Friedman. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*. Springer, 2009.

[9] A.E. Eiben and J.E. Smith. *Introduction to Evolutionary Computing*. Springer, 2015.