

Course Outline

1. Document Information

Degree Program	Computer Science
Course Number	CS 436
Course Title	Artificial intelligence I
Semester Hours	3
Course Coordinator	Banafsheh Rekabdar
Revision Term	Fall 2020
Latest Revision	Fall 2020

2. Catalog Description

Search and heuristics, problem reduction. Predicate calculus, automated theorem proving. Knowledge representation. Applications of artificial intelligence. Parallel processing in artificial intelligence.

3. Textbooks

- Sutton, R. S. & Barto, A. G. (2018). Reinforcement Learning: An Introduction. MIT Press, 2nd Edition. ISBN: 9780262039246.

4. References

5. Course Learning Outcomes

- To learn the basic concepts and techniques of artificial intelligence, research areas and applications.
- To understand the concepts of heuristic search and knowledge, and the relevance of AI research to cognitive science.
- To learn Lisp and Prolog programming languages.

6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6
Assessed		X	X			X

7. Prerequisites by Topic

CS 331 and 330 each with a grade of C or better or graduate standing.

8. Major Topics Covered in the Course

1. Artificial intelligence: introduction, intelligent agents {3 classes}
2. Problem solving: solving problems by searching, informed search and exploration, constraint satisfaction problems, adversarial search {8 classes}
3. Knowledge and reasoning: logical agents, first-order logic, inference in first-order logic, knowledge representation {8 classes}
4. Planning: planning and acting in the real world {3 classes}
5. Uncertain knowledge and reasoning: uncertainty, probabilistic reasoning, probabilistic reasoning over time, making simple decisions, making complex decisions {10 classes}
6. Learning: learning from observations, knowledge in learning, statistical learning methods, reinforcement learning {4 classes}
7. Communicating, Perceiving, and Acting: communication, probabilistic language processing, perception, robotics {4 classes}