

# Course Outline

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## 1. Document Information

<b>Degree Program</b>	Computer Science
<b>Course Number</b>	CS 436
<b>Course Title</b>	Artificial Intelligence I
<b>Semester Hours</b>	3
<b>Course Coordinator</b>	Banafsheh Rekabdar
<b>Revision Term</b>	Spring 2020
<b>Latest Revision</b>	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	7
Assessed	X	X	X	X	X	X	

## 7. Prerequisites by Topic

CS 311 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}

NOTE: When course is taken as 500-level credit (CS 591 "Special Topics"), there will be additional requirements such as a research project.