

CSCE 4310-001 Introduction to Artificial Intelligence  
CSCE 5210-001 and -600 Artificial Intelligence

Introduction to concepts and ideas in artificial intelligence, including topics such as search techniques, adversarial search & games, knowledge representation, problem-solving, logic, probabilistic reasoning, machine learning, perception, natural language processing, robotics, and the future of artificial intelligence.

Required Text:

Artificial Intelligence, A Modern Approach, Stuart Russell, Peter Norvig, 2010,  
ISBN: 978-0-13-604259-4

## TOPICS

### ARTIFICIAL INTELLIGENCE

1. Introduction
2. Intelligent Agents

### PROBLEM SOLVING

3. Solving Problems by Searching
4. Beyond Classical Search
5. Adversarial Search
6. Constraint Satisfaction Problems

### KNOWLEDGE AND REASONING\*

7. Brief Introduction to Logic and Knowledge Representation\*

### UNCERTAIN KNOWLEDGE AND REASONING\*

8. Brief Introduction to Uncertainty in AI\*

### MACHINE LEARNING

9. Decision Trees
10. Artificial Neural Networks
11. Other ML Algorithms and Ensemble Learning
12. Deep Learning
13. Reinforcement Learning

### COMMUNICATING, PERCEIVING AND ACTING

14. Natural Language Processing
15. Natural Language Communication
16. Machine Vision
17. Robotics

### CONCLUSIONS

18. The Future of AI

*\* 7 & 8 will only be a brief overview*

Final Exam: Thursday, May 9, 8:00am-10:00am, Room NTDP B140

ADA accommodation: UNT Policy 16.001: <https://policy.unt.edu/policy/16-001>

Academic Integrity Expectations: *Do the right thing!*

Per UNT Policy 06.003: <https://policy.unt.edu/policy/06-003> consequences of violations could include course failure, or in some repeat cases, expulsion.

### Learning Objectives:

1. Use and create programs that demonstrate understanding (including computational complexity) of search algorithms such as depth first, breadth first, iterative deepening, A\*, Hill-climbing.
2. Implement programs that demonstrate understanding of two-person adversarial games (partially observable, stochastic, with state spaces too large to search).
3. Demonstrate basic understanding of logic and knowledge-based computational reasoning and probabilistic reasoning.
4. Utilize and demonstrate fundamental principles of machine learning algorithms and computational learning theory.
5. Use and create programs that show understanding of machine learning techniques.
6. Apply AI techniques in computational linguistics, machine vision and robotics.

### Major Assignments:

*Midterm:* A midterm exam will assess your competency with regard to the learning objectives and topics covered from the beginning through supervised ML (not reinforcement learning).

*Final Exam:* A final exam will assess your competency with regard to the learning objectives and topics covered throughout the semester.

### Grading:

- 10% Class participation (asking and answering thought provoking questions)
- 30% Homework assignments
- 25% Midterm Exam
- 25% Final Exam
- 10% Self Assessment

Under extraordinary circumstances, late assignments might be accepted for partial credit if negotiated in advance with the instructor.

Attendance is required and will be reflected as a component of the class participation grade.

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