

Course Code  
**COMP 3211**

Course Title  
**Fundamentals of Artificial Intelligence**

### Course Description

Foundations underlying design of intelligent systems. Relations between logical, statistical, cognitive, biological paradigms; basic techniques for heuristic search, theorem proving, knowledge representation, adaptation; applications in vision, language, planning, expert systems.

### List of Topics

- Simple intelligent agents
- Search (Uniformed, Heuristic, Adversarial)
- Learning
- Knowledge Representation, Reasoning, and Planning
- Multiagent systems, game theory and auction
- Uncertainty
- Others

### Textbooks

N/A

### Reference books

N. Nilsson. Artificial Intelligence: A New Synthesis. Morgan Kaufmann Publishers, Inc., 1998.

S. Russell and P. Norvig. Artificial Intelligence: A Modern Approach. Second Edition. Prentice Hall, 2003.

Y. Shoham and K. Leyton-Brown. Multiagent Systems: Algorithmic, Game-Theoretic, and Logical Foundations. Cambridge University Press (December 15, 2008)

I. Goodfellow and Y Bengio and A Courville. Deep Learning. MIT Press 2016.

R. Sutton and A. Barto. Reinforcement Learning: An Introduction. 2nd Edition. MIT Press, Cambridge, MA, 2018. (<http://www.incompleteideas.net/book/the-book-2nd.html>)

## Grading Scheme

Assignments (including programming assignments)	15%
Midterm	40%
Final exam	45%
Bonus points for active participation in class discussions and other worthy contributions.	
Total	100%

## Course Intended Learning Outcomes

1. Identify the fundamental concepts and techniques of AI: autonomous agents, search, knowledge representation, and machine learning.
2. Understand and apply techniques for searching state spaces, including breadth-first, depth-first, best-first, A\* search, minmax game tree search, minmax with alpha-beta pruning, and hill-climbing search.
3. Appreciate some cutting edge research in AI such as multiagent systems, game theory, ontology, semantic web, big data, deep learning, and others

## Assessment Rubrics

N/A