# CSC 830 - Advanced Artificial Intelligence

## Lecture 00: Introduction and Course Overview

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# Introduction and Course Overview

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- Heuristic problem solving, theorem-proving techniques, and knowledge representation, including the use of appropriate programming languages and tools. Machine Learning

# Recommended Textbooks

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- P. H. Winston, Artificial Intelligence, Addison Wesley.
- Giarratano & Riley, Expert Systems: Principles and Programming, PWS Publishing

# Intended Learning Outcomes

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Upon completion of this course students will be able to:

1. analyze and understand software agents homework, project
2. use the LISP programming language, especially for recursive functions tests, homework, project.
3. convert net search to tree search tests, homework.
4. perform depth-first, breadth-first, and hill climbing search from a starting node to a goal node tests, homework.
5. determine optimal search paths using the A* search algorithm tests, homework, project.
6. represent knowledge in predicate calculus form tests, homework
7. use resolution for theorem proving tests, homework
8. represent knowledge in rule form and use the CLIPS rule-based system homework, project.

# Course Contents

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- Overview, class policies; introduction to AI; LISP Programming: Basic LISP Primitives; Function definition and Invocation.
- Knowledge Representation via Propositional Logic (PL)
- Knowledge Representation via First-Order (Predicate) Logic (FOL)
- Rule-based Systems: Knowledge representation using rules; Deduction systems
- SEARCH: Net and Tree Search; Depth-First and Breadth-First Search
- Optimal Search; A* algorithm
- Adversarial Search
- Introduction to Machine Learning: Concept Learning and Version Spaces; Decision Trees Learners; Neural Networks
- Introduction to Machine Learning: Neural Networks
- Support Vector Machines (SVM)
- Genetic Algorithms (GA)
- Natural Language Processing (NLP)