**Course Information for CSCI 377**

**Course Number:** CSCI 377

**Title:** Artificial Intelligence

**Instructor:** Mark Hopkins

**Day & Time:** ﻿MWF 1215-105pm (Section 1), MWF 135-225pm (Section 2), MWF 310-4pm (Section 3)

**Room(s):** Performing Arts 320 (Sections 1 and 2), Online (Section 3)

**Instructor Information**

**Office:** Library 382

**Office Hours:** M 10-1130pm, WF 4-5pm

**Contact information:** hopkinsm@reed.edu

**Course Description**

An introduction to the construction of software systems that emulate intelligent behavior. Topics include knowledge representation, reasoning under uncertainty, logic, planning, and algorithmic strategies for large-scale combinatorial search. Students will explore these topics with a series of implementation projects. Prerequisite: Computer Science 382.

**Learning Outcomes**

After successful completion of the course, a student should:

1. Understand introductory concepts in AI logic, as demonstrated by the following skills:
   1. Express logical statements using propositional and first-order logic, and understand the ontological difference between propositional and first-order logics.
   2. Apply and analyze logical inference algorithms, such as resolution and forward/backward chaining
2. Understand introductory concepts in AI search, as demonstrated by the following skills:
   1. Implement and analyze uninformed search strategies such as BFS, DFS, and depth-limited search, and bidirectional search
   2. Implement heuristics in informed search strategies, as well as identify the aspects of a good heuristic
   3. Implement and analyze simple game search algorithms, e.g. minimax and alpha-beta pruning
3. Understand introductory concepts in probabilistic models and reinforcement learning, as demonstrated by the following skills:
   1. Construct probabilistic models of uncertainty and compute/understand associated concepts like d-separation.
   2. Implement a reinforcement learning engine for a simple scenario, like learning to play blackjack.

**Distribution Requirements**

This course can be used towards your Group III, “Natural, Mathematical, and Psychological Science,” requirement. It accomplishes the following learning goals for the group (indicate as appropriate):

* Use and evaluate quantitative data or modeling, or use logical/mathematical reasoning to evaluate, test or prove statements

This course **does not** satisfy the “primary data collection and analysis” requirement.