

COURSE DESCRIPTION

Dept., Number	CS 4341	Course Title	Introduction to Artificial Intelligence
Semester hours	3 cr.hrs.	Course Coordinator	David C. Brown

Current Catalog Description

This course studies the problem of making computers act in ways which we call “intelligent”. Topics include major theories, tools and applications of artificial intelligence, aspects of knowledge representation, searching and planning, and natural language understanding. Students will be expected to complete projects which express problems that require search in state spaces, and to propose appropriate methods for solving the problems. Intended audience: computer science majors. Undergraduate credit may not be earned both for this course and for CS 534. Recommended background: CS 2102 and CS 2223. Suggested background: CS 3133.

Textbook

Patrick Henry Winston, *Artificial Intelligence* (3rd Edition), Addison Wesley, 1992.

References

Provided via course web pages.
e.g., <http://web.cs.wpi.edu/~dcb/courses/CS4341/2007/>

Course Outcomes

- a) Use advanced knowledge representation techniques.
- b) Use advanced problem solving strategies.
- c) Understand computational approaches to planning, learning, vision, and natural language processing.
- d) Design, implement and analyze computer programs that reason and/or act intelligently.
- e) Experiment with machine learning approaches and analyze results.
- f) Adequately document system design decisions.
- g) Discover and use material relevant for the solution of under-specified design problems.

Relationship between Course Outcomes and Program Outcomes

a – 9
b – 9, 10
c – 9
d – 3, 8, 9
e – 9, 13
f – 21
g – 14, 15

Prerequisites by Topic

None.

Major Topics Covered in the Course

Intro to AI; Intro to KR; Semantic Nets; Matching; Analogy; Generate & Test; Means Ends Analysis; Problem Reduction; Blind Search; Heuristic Search; Adversarial Search; Rule-based Systems; Knowledge Acquisition; Frames; Commonsense; Primitives; Constraints & CSPs; Logic & Resolution; Backtracking; Planning; Inductive Learning; CBR; Version Space; ID3; GAs; Object Recognition; Describing Images; Intro to NLU; Questions & Commands.

Assessment Plan for the Course

a – Exam1, Exam2, Projects 1-3
b – Exam1, Exam2, Projects 0-3
c – Exam2, Project3
d – Exam1, Exam2, Projects 0-3
e – Project 3
f – Projects 0-3
g – Projects 0-3

How Data in the Course is Used to Assess Program Outcomes:

See the assessment discussion under Criterion 4.

For a computer science program

Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms		1.5	Software design		1.0
Data structures		0.5	Concepts of programming languages		