

# CSE 4521 (Approved): Survey of Artificial Intelligence for Non-Majors

## Course Description

Survey of the basic concepts and techniques in artificial intelligence, including problem solving, knowledge representation, and machine learning.

**Prior Course Number:** CSE 630

**Transcript Abbreviation:** AI for Non Majrs

**Grading Plan:** Letter Grade

**Course Deliveries:** Classroom

**Course Levels:** Graduate

**Student Ranks:** Masters, Doctoral

**Course Offerings:** Autumn

**Flex Scheduled Course:** Never

**Course Frequency:** Every Year

**Course Length:** 14 Week

**Credits:** 3.0

**Repeatable:** No

**Time Distribution:** 3.0 hr Lec

**Expected out-of-class hours per week:** 6.0

**Graded Component:** Lecture

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** CSE 1211 or CSE 1221 or CSE 1222 or CSE 1223 or CSE 2221 or graduate standing

**Exclusions:** Not open to CSE or CIS majors; not open to students with credit for CSE 3521 or CSE 5521 or CSE 630

**Cross-Listings:**

**The course is required for this unit's degrees, majors, and/or minors:** No

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.0901

**Subsidy Level:** Doctoral Course

## General Information

Intended audience is minors in cognitive science or CIS, or graduate students in related fields. Course assumes some prior exposure to quantitative and/or computational thinking. Students who satisfy the course prerequisite by appeal to graduate standing are strongly advised to consult the instructor if they are in any doubt about the suitability of their preparation.

## Course Goals

Master basic search techniques for problem-solving, including systematic blind search, heuristically-guided search, and optimal search.

Be familiar with game tree search methods and the requirements for expert-level game play.

Be familiar with using logic and proof as a basis for knowledge representation and automated reasoning.

Be exposed with multiple knowledge-representation formalisms.

Be exposed to problems in common sense reasoning and language understanding.
Be exposed to integrated AI architectures as a platform for building AI systems.
Be exposed to machine learning techniques and the kinds of problem they solve.
Be exposed to state-of-the-art AI applications related to robotics, machine vision, speech recognition, and computer games.
Be familiar with the implications of widely deployed AI technology for society in general and for a sample of other academic disciplines.

## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Basic representation and problem solving methods	6.0							
Overview of data abstractions for search; definitions of graphs, trees, tree and graph traversals	2.0							
Search techniques and game playing	7.0							
Knowledge representation using logic, automated proof techniques	5.0							
Machine learning, probabilistic inference	6.0							
Planning and common sense reasoning	3.0							
Perception and communication	4.0							
Applications	5.0							
AI and games	3.0							

## Representative Assignments

Compare breadth-first, depth-first, and A* search on a problem domain.
Apply reinforcement learning to maze navigation.

## Grades

Aspect	Percent
Homeworks and labs	40%
Midterm	25%
Final	35%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Artificial Intelligence, A Modern Approach (3rd edition)</i>	Stuart Russell and Peter Norvig

## ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
***	a	An ability to apply knowledge of mathematics, science, and engineering.
**	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
*	c	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
**	e	An ability to identify, formulate, and solve engineering problems.

<b>Course Contribution</b>		<b>College Outcome</b>
*	f	An understanding of professional and ethical responsibility.
	g	An ability to communicate effectively.
*	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
*	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
**	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Prepared by:** John Fosler-Lussier