

**Master Course Syllabus**  
School of Engineering and Computer Science  
Washington State University Vancouver

**CS 440**  
**Introduction to Artificial Intelligence**  
3 Semester Hours  
(3 lecture hours)

**Catalog Description**

Basic issues of knowledge representation and automated problem solving; introduction to the theory and application of agent programming.

**Prerequisite Courses**

CS 320 – Fundamentals of Software Engineering

Stat 360/Math 212 – Probability and Statistics / Intro. to Statistical Methods

**Prerequisite Topics**

- Elementary calculus and statistics
- Propositional Logic / Logic Proof Procedures
- Proficiency in at least one programming language

**Measured Course Outcomes**

Students taking this course will (among other things):

1. Identify and describe agent design methods. (*Contributes to performance criterion J-2*)
2. Use and evaluate search based methods for solving problems. (*Contributes to performance criterion E-1*)
3. Formulate and manipulate logic expressions. (*Contributes to performance criterion A-1*)
4. Use and evaluate machine learning algorithms for solving classification problems. (*Contributes to performance criterion E-1*)
5. Implement AI Algorithms in a modern programming language. (*Contributes to performance criterion E-2*)

**Required Textbooks**

Artificial Intelligence: A Modern Approach, Second Edition; Stuart Russell and Peter Norvig. Pearson Education, Inc., 2003.

### **Reference Material**

None.

### **Major Topics Covered in the Course**

1. History of AI
2. Agents and Environments
3. Problem Solving as Search
4. Knowledge Representation
5. Machine Learning

### **Laboratory Projects**

Programming Project Area	Weeks
Simple Agent Designs	1
Search	2
Machine Learning	2

### **CSAB Category Content**

	FUNDAMENTAL	ADVANCED		FUNDAMENTAL	ADVANCED
Data Structures	0	0	Computer Organization and Architecture	0	0
Algorithm & Software Design	0	2	Concepts of Programming Languages	0	0

### **Oral and Written Communications**

There are no significant oral or written communications required in this course. Virtually all assignments are either theoretical or implementation problems.

### **Social and Ethical Issues**

This course contains no significant coverage of social and ethical issues beyond the usual proscriptions against plagiarism and cheating.

### **Theoretical Content**

Topic	Hours
Search as Problem Solving	5
Knowledge Representation	3

**Problem Analysis**

A variety of problems are examined that have no obvious algorithmic solution. By examining the constraints of the problem, students will select and apply the methods of artificial intelligence to synthesize solutions.

**Solution Design**

In this course, solution design requires students apply problem solving strategies such as search and learning to a variety of problems, either at the conceptual level (on paper) or through a working implementation. Solution designs are examined in class, and form the basis for homework exercises, exam questions and programming projects.

**CC2001**

This course provides coverage of topics in the following areas (hours listed are minimums):

IS1. Fundamental issues in intelligent systems [core]	1
IS2. Search and constraint satisfaction [core]	5
IS3. Knowledge representation and reasoning [core]	3
IS6. Agents [elective]	2
IS8. Machine learning and neural networks [elective]	3

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Course Coordinator: Scott Wallace  
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