



Course title and number CSCE 625 AI Robotics  
Term (e.g., Fall 200X) Spring 2017  
Meeting times and location MWF 1:50-2:40PM, ETB 1035

## Course Description and Prerequisites

Basic concepts and methods of artificial intelligence; Heuristic search procedures for general graphs; game playing strategies; resolution and rule based deduction systems; knowledge representation; reasoning with uncertainty.

The course is a broad survey that will require a significant amount of reading with hands-on exploration of existing AI programs and languages- including PROLOG and Lisp. It will provide an understanding of the state of the practice of AI and set the foundation for further study in agency, machine learning, fuzzy logic, neural networks, robotics, uncertainty, and computer vision.

## Learning Outcomes or Course Objectives

By the end of the semester, the student should have a firm foundation in the organization and practical implementation of software for artificial intelligence:

- *Have an understanding of the breadth of AI.* This will be measured by in class quizzes.
- *Apply the basic techniques for creating intelligent programs.* This will be measured by the four programming projects.
- *Apply the right programming language or technique to the right problem.* This will be measured by the four programming projects and the research paper.
- *Be able to evaluate a proposed AI application for likelihood of success.* This will be measured by in class quizzes and the research paper.
- *Be able to discern sensationalism from science on the possible impact of AI on society.* This will be measured by in class quizzes.

## Instructor Information

Name Dr. Robin R. Murphy  
Telephone number 979-845-8737  
Email address [robin.r.murphy@tamu.edu](mailto:robin.r.murphy@tamu.edu) **NOTE: email MUST HAVE "CSCE 625" in the subject line or it will not be read**  
Office hours TBD and by appointment  
Office location HRBB 333A

## Textbook and/or Resource Material

*Artificial Intelligence: A Modern Approach* 3rd Edition by Russell and Norvig (the 3<sup>rd</sup> edition is significantly different from the 2<sup>nd</sup> edition and the illegal pdf download has significant errors)

We will use piazza as the website and repository for the course, if you are not automatically enrolled, please go enroll at [piazza.com/tamu/spring2017/csce625murphy](https://piazza.com/tamu/spring2017/csce625murphy)

## Grading Policies

There will be no incompletes or make-up sessions for the programming projects or research paper.

- 80% Programming projects. There are 4 programming projects, each worth 20%. Generally the projects and code will be discussed in class but implemented individually by each students unless specifically announced that team implementations are acceptable for a specific program assignment.
- 10% In-class quizzes over chapter readings from textbook.
- 10% Research paper on approved topic of the student's choice.
- *There is no final examination but the research paper will be presented on that day.*

## Course Topics, Calendar of Activities, Major Assignment Dates (Tentative)

Date	Day	Topic	Reading Assignments Due
18-Jan	W	Intelligent agents	1, 2
20-Jan	F	Search overview	3, 4
23-Jan	M	Informed search	3,4
25-Jan	W	No class	
27-Jan	F	<b>Program 1 Agents and Problem Solving: Discovery</b>	
30-Jan	M	Adversarial search	5
1-Feb	W	Constraint satisfaction	6
3-Feb	F	<b>Program 1 Agents and Problem Solving: Discovery</b>	
6-Feb	M	Knowledge representations	12
8-Feb	W	Predicate logic	7, 9
10-Feb	F	<b>Program 1 Agents and Problem Solving: Studio</b>	
13-Feb	M	<b>Program 1 Agents and Problem Solving: Final presentation and deliverables</b>	
15-Feb	W	Logic	8, 9
17-Feb	F	<b>Program 2 Knowledge and Reasoning: Discovery</b>	
20-Feb	M	Fuzzy logic	
22-Feb	W	Planning	10, 11
24-Feb	F	<b>Program 2 Knowledge and Reasoning: Discovery</b>	
27-Feb	M	Planning	10, 11
1-Mar	W	Uncertainty	13
3-Mar	F	<b>Program 2 Knowledge and Reasoning: studio</b>	
6-Mar	M	<b>Program 2 Knowledge and Reasoning: Final presentation and deliverables</b>	
8-Mar	W	No class	
10-Mar	F	Midterm review	

20-Mar	M	Probabilistic reasoning	14
22-Mar	W	Probabilistic reasoning	14
24-Mar	F	<b>Program 3 Uncertainty and Learning: Discovery</b>	
27-Mar	M	Decision making	16
29-Mar	W	Learning	18,19
31-Mar	F	<b>Program 3 Uncertainty and Learning: Discovery</b>	
3-Apr	M	Deep learning	18,19
5-Apr	W	Reinforcement learning	21
7-Apr	F	<b>Program 3 Uncertainty and Learning: Studio</b>	
10-Apr	M	<b>Program 3 Uncertainty and Learning: Final presentation and deliverables</b>	
12-Apr	W	Natural language	22,23
14-Apr	F	<b>Program 4 Communication: Discovery</b>	
17-Apr	M	Natural language	22,23
19-Apr	W	Perception	24
21-Apr	F	<b>Program 4 Communication: Discovery</b>	
24-Apr	M	Robotics	25
26-Apr	W	Affect, Ethics	
28-Apr	F	<b>Program 4 Communication: Studio</b>	
1-May	M	<b>Program 4 Communication: Final presentation and deliverables</b>	
8-May	M	Research paper oral presentation and written report due during final period (3:30-5:30PM)	

### Other Pertinent Course Information

The programming projects for this class will be taken from problems encountered while working with lifeguards to save refugees from drowning in Europe. The best projects will likely be implemented in the field and those students have an opportunity to travel to conduct field exercises with responders.

### Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit <http://disability.tamu.edu>.

Accommodations cannot be made after the fact; therefore if you need accommodations you should inform the instructor on the first day of class and then submit the documentation within the first two weeks of the semester if possible. If I know that the documentation is coming, I can work with you.

### Academic Integrity

For additional information please visit: <http://aggiehonor.tamu.edu>

*“An Aggie does not lie, cheat, or steal, or tolerate those who do.”*

Please be aware I will seek the most stringent penalty for violations of academic integrity. If you have trouble keeping up, talk to me and let me help. Cheating on tests and written materials will only compound problems in acquiring the fundamental understanding of AI needed to pass the course.