Syllabus: Artificial Intelligence

For the 2011-2012 School Year

Contact Information

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Fall Semester

Students study AI techniques in a variety of contexts with an emphasis on generalizing search algorithms. Topics include graphs, heuristics, optimization, recursion, pruning, and games. Programming assignments include word ladders, navigating across Romania, sliding-tile puzzles, N-queens and other local search, GHOST, Tic-Tac-Toe and Reversi.

Spring Semester

Students study AI techniques in a variety of contexts with an emphasis on knowledge representation. Topics include image processing, machine vision, constraint solvers, agent based modeling, and learning. Programming assignments include edge detection, the Hough transform, segregation models, Sugarscape, map coloring, Sudoku, and neural networks.

Grading

Both courses are weighted in the same manner as an AP course; this means that each semester an additional 0.5 quality point will be added to the quality-point value assigned to the final grade. This happens after the quality-point value is divided by two, since they're semester courses. For the whole year, then, the semester values are added and: $0.5 + 0.5 = 1.0$

Each semester grade will be determined as follows:

Grade Event	Points	Quantity	Total
Quarter Grade Final Percentage Earned	100	2	200
Class Participation Appropriate Behavior	20	1	20
TOTAL SEMESTER POINTS	–	–	220

There is no final exam. The class participation grade will appear on your report card as the final exam grade for the semester and is earned over both quarters. On the last day of each quarter there will be an in-class culminating activity.

Each quarter grade will be determined as follows:

Grade Event	Points	Quantity	Total
Program Turn-In Lab Write-Up	10	5	50
In-Class Closed Book Quiz	10	5	50
Last-Day Culminating Activity	5	1	5
TOTAL QUARTER POINTS	–	–	105

The current FCPS grading scale:

Letter Grade	Quality Points	Half-Open Percentage Intervals	
		$\geq$	$<$
A	4.0	92.5	$100+\epsilon$
A-	3.7	89.5	92.5
B+	3.3	86.5	89.5
B	3.0	82.5	86.5
B-	2.7	79.5	82.5
C+	2.3	76.5	79.5
C	2.0	72.5	76.5
C-	1.7	69.5	72.5
D+	1.3	66.5	69.5
D	1.0	64.0	66.5
F	0.0	0.0	64.0

There is no extra credit.

All quiz topics are unannounced and there is no formal review session prior to a quiz.

In the case of unplanned absences, students should make arrangements for any necessary makeup immediately upon return to school. For each class absence, students have one class session for makeup. No extension is provided for new work assigned after the student has already returned to school. For an approved prearranged absence, it is the student's responsibility to make arrangements in advance of the absence.

For program turn-in lab write-ups a paper copy must be submitted by the time buses leave. No email. The location for submissions will be clearly indicated and if all else fails use the mailboxes in the main office. There is a grace period of two school days following all due dates except at the end of the quarter. After the grace period ends, late work may be turned in by the end of the next school day (even if our class does not meet that day) with a penalty of one point, or on subsequent days with a cummulative penalty of one point per calendar day. The total penalty will not exceed five points but all assignments must be turned in by 8 AM on the first teacher workday after the quarter to receive any credit.

Programming Language

The programming language is Python. No prior experience is assumed. Software for home-use is available for free at www.python.org which is linked from the course website.

Textbook

The textbook is Russell and Norvig, Artificial Intelligence: A Modern Approach, 2nd edition. The ISBN is 0-13-790395-2 and the cost is eighty-five dollars. Students may check out a book if they like. Together the two courses cover chapters one through six of the text, part of chapter twenty, and supplemental material on image processing.

Website

All course materials are posted at www.tjhsst.edu/compsci/ai and no login is required.

Lab Hours

The lab is generally open before school, during lunch, and eighth period. You can also connect to remote.tjhsst.edu using ssh or PuTTY, and transfer files using sftp or WinSCP.

Fire Drills

Exit via the back door of the lab. This leads directly to the outside. Bear left toward the fenceline on the side of the school to avoid the people coming out of the trailers.

Crisis Situations

"Secure the Building": neighborhood incident, students in rooms with doors locked. "Lockdown": threat on property, students on floor with lights out and blinds pulled.

Computer Ethics

All students are expected to comply with the Fairfax County Network User Guidelines and an easy way to do this is to be engaged exclusively on work for this class at all times.

Other Guidelines

All students are expected to adhere to the TJ Honor Code and the FCPS Dress Code. This class encourages collaboration and sharing which means talking together about a lab assignment. Plagiarism is copying another person's work and presenting it as your own.

Repeated or one-time grossly unacceptable behavior will be reported to the guidance department, the administration, and your parents.

Schedule

September	Graphs and Search
October	Heuristics
November	Genetic Algorithms
December	Game Trees
January	Minimax and Pruning
February	Machine Vision
March	Agent-Based Models
April	Constraint Solvers
May	Knowledge Representation
June	Neural Networks