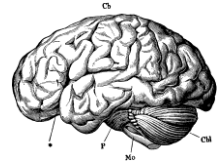**Instructor**:   Jason Witherell
Office & Office-hours: ATC325, M-R 8:15a – 9am, W 2:30p – 3:30p (or by appointment)
jwitherell@shawnee.edu
ssucet.org (course content)
blackboard.shawnee.edu (lab submission and class grades)

Catalog Description:

This course provides an introduction to the fundamental concepts and techniques underlying the construction of artificially intelligent computer systems. Topics covered may include: problem-solving and search; logic and knowledge representation; planning; reasoning and decision-making in the presence of uncertainty; machine learning; natural language processing; neural networks; and other topics. Lab activities will focus upon the design and implementation of working AI systems. Prereq: ETEC 3402 lecture hours 2 lab hours 3 Course/Lab Fee $.

Student Learning Outcomes / Course Goals (and relative weight): *Upon completion of this course, you should…*
1. (40%) have been exposed to a variety of AI techniques and be familiar with their implementation.
2. (40%) Have an opportunity to improve upon your software engineering skills by planning and implementing a variety of small-scale simulations to implement a complex (and messy) idea.
3. (10%) Have a chance to experiment with programming languages you didn't get to explore during previous courses.
4. (10%) Have an opportunity to give an in-depth lecture over a topic of interest to you.

Textbooks / Suggested References:

(Optional) Title: **Artificial Intelligence for Games**
Author: Ian Millington   ISBN: 0-12-497782-0 (No CD-ROM)
Heavy on the math, but seems to be a good reference. Has a lot of game-oriented chapters not found in most classical AI texts.

(Optional) Title: **Artificial Intelligence: A Modern Approach, 3rd edition**
Author: Stuart Russell and Peter Norvig   ISBN: 0-13-604259-7
A text I used in graduate school. Much more in-depth (and mathematical) than other texts, but most researchers consider this "the" AI book.

(Optional) Title: **Artificial Intelligence: A New Synthesis**
Author: Nils J. Nilsson   ISBN: 1-55-860467-7
A little more readable, but with sometimes (much) less detail than the Russell & Norivg text. I used this for several labs in the class. Good overviews of a lot of topics, but sometimes you need more detail to actually implement the algorithms.

Grading System: Your grade will be completely based on lab assignments and the lecture you give at the end of the semester, weighted as follows:
- (90%) Lab Assignments
- (10%) Final Presentation

Min%	94	90	87	84	80	77	74	70	67	64	60	0
Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Attendance:

will be taken, but won't directly affect your grade. You're an adult – decide if coming to class is worth your time or not. You will, however, be responsible for *anything* covered in class, including announcements on due-dates, tests, etc. even if you're not there.

Lab Assignments:

Since this is a survey class (and not a linear collection of labs like ETGG3801), I want you to have some flexibility in choosing that lab assignments that interest you most. As such, I'll base the number of points possible on lab assignments to be 85% of all points available (not counting bonus) on the labs that *I* give.

Generally, you can do the lab in whatever language you choose, including an engine. Ocasionally I might require that you not use an engine, or not use a specific feature (for example, in the pathfinding lab, I want you to either not use an engine, or not use the built-in pathfinding tools [e.g. NavMesh agents in Unreal]). Some students see this as an opportunity to master a language that they already know; others see it as an opportunity to learn a new language.

Students have the option of preparing one lecture (which can count as your final presentation) and one lab to be given as an alternate to other students. If you develop such a lab (including a solution to demonstrate), we'll come up with a fair number of points to award to you. If you choose to complete a lab that another student has offered, it will count towards your points earned, but *won't* count towards the points possible.

This year, I'm implementing a **no-paired-programming** policy. I've had too many problems with this in the past (mainly that one student is able to skate through the class based primarily on the work of another student)

I'm going to experiment with a new due date policy this semester. I'm going to grade via demonstration: I'll have a check-list and when you are ready to submit a lab, I'll grade it with you (after asking questions, looking at code, etc.). For the due dates, I'll announce (very soon, and with a little consultation with you), approximately 3 deadlines. Each lab will be due in one of those deadlines (after which no more submissions will be made) – kind of a hybrid "sweet-sweet-oblivion" / "guillotine" approach.

Final Presentation

In the (approximately) last 3 weeks of the semester, we'll start giving presentations. You are expected to come up with an interesting AI topic (I can provide some suggestions), confirm it with Jason (to avoid duplicates), and schedule a time.

Presentations are to be about 20 minutes (including 5 minutes for Q & A), have visual aids (PowerPoint, videos, etc.) and be well-researched (including a list of cited references).

A significant part of your grade in this area will be attending and paying attention to other students presentations.

Tentative Topics: *I hope to cover these…*
- Emergent Behavior
  - Cellular Automata / Cellular Morphogenesis
  - Flocking
- Gaming-specific
  - Pathfinding
  - Class Game Playing
- Pattern-recognition
  - Decision Trees (data mining)
  - Eigen-Faces
  - Neural Networks (would also fit under Machine Learning)
- Machine Learning: Genetic Algorithms
- Knowledge Representation:
  - Prolog Intro
  - Constraing-based solvers
- Probability: Hidden Markov Models
- Computer Vision:
  - Hu Moments and simple pattern recognition
  - OpenCV Intro

Resources for help:
- The instructor – I should be your first line of defense
- The class SI (if we can obtain one) – listen for announcement on this.
- Your academic advisor: career advice, etc.
- Larry Miller (ATC315), Engineering Technologies chair: troubles with instructor, changing majors, degree paperwork, etc.
- Lindsay Monihen (MAS132), CPS advisor: academic crises, financial aid questions, transferring, etc.
- Dean of Students Office (UC 222): resolution of academic and non-academic difficulties.
- Student Ombudsperson, Linda Hunt (ADM 140): help with appeals, complaints.

Americans with Disabilities Act Policy

Any student who believes s/he may need an accommodation based on the impact of a documented disability should first contact a Coordinator in the Office of Accessibility Services, Student Success Center, Massie Hall, 740-351-3276 to schedule a meeting to identify potential reasonable accommodation(s) . Students are strongly encouraged to initiate the accommodation process in the early part of the semester or as soon as the need is recognized. After meeting with the Coordinator, students are then required to meet with their instructors to discuss the student's specific needs related to their disability. If a student does not make a timely request for disability accommodations and/or fails to meet with the Coordinator of Accessibility Services and the instructor, a reasonable accommodation might not be able to be provided.

Important Dates: Note the student business center generally closes around 4pm.
- 8/21/2017 (M): classes begin
- 8/25/2017 (F): Last day to add a class on MySSU
- 9/1/2017 (F): Last day to add a class (with instructor *and* Dean approval)
- **9/4/2017 (M): Labor Day (UNIVERSOTY CLOSED!)**
- 9/29/2017 (F) – 10/1/2017 (Su): GDEX conference in Columbus (bonus points for ETGG classes?)
- **10/5/2017 (R), 10/6/2017 (F): Fall Break (NO CLASSES!)**
- 10/7/2017 (Sa): Midterm grades available on MySSU
- **10/30/2017 (M): Registration for Spring Semester starts (M=Seniors, Veterans, etc. T=Juniors, etc.)**
- **11/1/2017 (W): Last day to drop a class on MySSU**
- 11/3/2017 (F): Shawnee 2017 gaming conference (bonus points for ETGG classes?)
- 11/10/2017 (F): Veterans Day (UNIVERSTY CLOSED!)
- **11/22/2017 (W) – 11/24/2017 (F): Thanksgiving Break (NO CLASSES (W), UNIVERSITY CLOSED (R,F)!)**
- 12/8/2017: Last day to petition to graduate, Last day of classes
- 12/9/2017 (Sa) – 12/15/2017 (F): Final Exam week (our "exam" is Thursday 12/14/2017 from 2:00 – 3:50pm)
- 12/20/2017 (W): Final grades available on MySSU