



EAST TENNESSEE STATE UNIVERSITY

CSCI 4957/5957 – Artificial Intelligence

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Office: 479 Nicks Hall
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TR 3:30pm – 4:30pm
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Course Site: <https://elearn.etsu.edu>

Best way to contact: Slack, Email, In Person

Course Overview

Section Information

CSCI 4957-201/5957-201	Special Topics in Computer Science (Artificial Intelligence)
Meeting Time:	7:00pm – 10:00pm
Meeting Location:	Nicks Hall 320/490

Catalog Description

Prerequisites: CSCI 2210 or CSCI 2910

This course provides an introductory survey of Artificial Intelligence (AI) and covers the history and theory of AI, and its associated algorithms. Basic concepts include an overview of AI; intelligent agents; problem solving and searching; knowledge, reasoning and planning; decision-making; machine learning; and emerging topics in AI. Topic exploration will involve programming components and brief written work, so **good programming and communication skills are expected.**

Learning Outcomes

The student shall be able to:

1. Demonstrate an understanding of search space, searching, and path finding,
2. Demonstrate an understanding of basic game theory and multi-agent systems,
3. Apply supervised and unsupervised learning techniques,
4. Apply logic systems and probabilistic reasoning,
5. Apply decision trees and neural networks to given situations.

Major Topics

- Introduction to Artificial Intelligence: History, Agent Architectures
- Basic Search: State-space, breadth-first search, depth-first search, A* search;
- Advanced Search: algorithms and techniques, genetic algorithms for searching;
- Constraint Satisfaction Problems;
- Planning;
- Knowledge Representation
- Uncertainty and Probabilistic Reasoning: Probabilistic Models and Bayesian Networks
- Learning: Decision Trees, Support Vector Machines, Artificial Neural Networks;
- Natural Language Processing

Course Materials

Textbook – Required

Russell, S., & Norvig, P. (2009). *Artificial Intelligence: A Modern Approach*. (3rd Ed.). Pearson Education, Inc. ISBN: 978-0-13-604259-4

Software

- The Python 3.x Programming Language, Anaconda 4.x distribution
- git – Specifically, GitLab.com, for assignment submission (This is experimental and may change)
- Slack – to enhance communication

Course Policies

Format

The emphasis of this course will be learning the basics of Artificial Intelligence and applying those basic concepts to both toy problems and real-world applications. Therefore, the course will consist of a hybrid delivery style that incorporates lecture and in-class activities, lab activities, and outside projects. All course materials and assignments will be available through the course website: <https://elearn.etsu.edu> and/or the course code repository on www.gitlab.com. **You should check these sites daily for updates and announcements.** *A tentative course schedule is provided.*

This course is 3 credit hours, and meets once per week. Theoretically, we will have two hours of lecture each week, with one hour of lab time.

Grading

The following grade scale will be used this semester. There is **no rounding** of calculated grades. While I generally do not change this scale, I reserve the right to adjust it slightly up or down at the end of the term.

	A	A-	B+	B	B-	C+	C	C-	D+	D	F
Undergraduate	≥ 93	90-92	87-89	83-86	80-82	77-79	73-76	70-71	67-69	60-66	< 60
Graduate	≥ 93	90-92	87-89	83-86	80-82	77-79	73-76	70-71			< 70

Evaluation

The final grade in the course is based on the students' performance on project deliverables, lab assignments, participation in in-class exercises, and examinations. The percentage breakdown, and an explanation of each assignment category follows.

Exams – Three of Equal Weight	60%
Project Assignments	25%
Lab Assignments	10%
Participation	5%

Exams

There will be three exams during the semester, counting 20% each. Each exam will cover only the portion the course material just completed. **The final exam** will focus on the last third of the term, but may cover previously-covered concepts to ensure you have met the learning objectives.

Exams may include a mixture of true/false, multiple choice, short answer, short essay, and activity-based questions. Exams may include take-home components.

Project Assignments

Project assignments are large-scale, detailed assignments that allow you to explore the material you have learned through lectures and labs. Each project assignment will have a specific due date and time, and will be submitted to GitLab rather than D2L. Submission instructions will be provided.

Lab Assignments

Lab assignments are smaller-scale assignments that allow you a hands-on experience with the material we are covering. We will generally have one lab each week, and will likely have in-class time to begin working on CSCI 4957/5957: Artificial Intelligence

the labs. If the lab is not completed in class, it will be assigned as homework. Each lab assignment will have a specific due date and time.

Exercises and Participation

Exercises are in-class assignments that illustrate points from the lectures for that day. These exercises allow you to gain a better understanding of the course content, and will help you study for exams. Exercises are participatory in nature and may result in participation grades. In addition, attendance may be used to calculate your participation grade.

Graduate Student Project

In addition to the normal project load, graduate students will complete one additional project during the semester. Graduate project deliverables will be dispersed throughout the semester and will culminate in a technical presentation at the end of the semester. This project will be research-based, and will focus on the current state-of-the-art in artificial intelligence. Graduate students may be encouraged to submit their findings to a journal, conference, or other technical meeting. This project will comprise 1/3 of the overall project grade for the course. Deliverables will include:

- Topic Choice and Annotated Bibliography
- Draft 1
- Draft 2
- Final Paper
- Technical Presentation

Attendance

Participation and Attendance

While I expect you to manage your time appropriately, spending time in class is important. Because attendance and grades are highly correlated, **attendance in this course is required**. Attendance and participation will be tracked and enforced in the following ways:

1. Attendance will be tracked via an attendance sheet. You must sign this sheet each class session to be considered present. Attendance is always taken, so not signing the sheet counts as an absence.
2. You must complete every assignment. Not submitting evidence of your work toward a solution for any assignment, no matter how small, will result in a grade of F. An exception will be made to this policy in the case of missed in-class exercises. You must complete every assignment on time.
3. Attendance Penalties:

Absences	Penalties Assessed
Missing 0-1 classes	No penalty
Missing 2-3 classes	The loss of one step of your final letter grade. For example, A becomes A-, A- becomes B+, etc.
Missing 4+ classes	The loss of one additional step of your final letter grade FOR EACH ABSENCE.

Makeup Work

All work is due at the date and time specified on the assignment specification. If that date or time changes for any reason, I will notify you either via email or through D2L (or both).

Accepting makeup work is at my discretion. When the due date for an assignment passes, I will generally not accept late work. You *may* be allowed to make up or submit work late in the case of an emergency situation. You must notify me of the situation as soon as possible. Exams may be made up only if given advanced notice of an extenuating circumstance. If you must miss an exam, notify me as soon as possible **BEFORE** the exam time to discuss your reason for missing, and to arrange a makeup. Excuses of “I forgot”, “I was asleep”, and “I underestimated the time the project would take” are not extenuating circumstances. Graded in-class activities cannot be made up.

Academic Misconduct Policy

ETSU Honor Code

East Tennessee State University is committed to developing the intellect and ethical behavior of its students. Students found to be in violation of policies on plagiarism, cheating, and/or fabrication will be held accountable for their actions. Any knowledge of academic misconduct should be reported. Students are expected to act with honesty, integrity, and civility in all matters.

ETSU Honor Pledge

By becoming a member of the campus community, students agree to live by the standards of the honor code and thereby pledge the following: "I pledge to act with honesty, integrity, and civility in all matters."

Course Honor Policy

Academic Misconduct in any form will not be tolerated. East Tennessee State University defines Academic Misconduct as an offense "for which both individuals and organizations may be subject to disciplinary action".

See these policies in the catalog, located at

http://catalog.etsu.edu/content.php?catoid=13&navoid=613#Student_Disciplinary_Policies

The University defines academic misconduct as follows:

Academic Misconduct. Plagiarism, cheating, fabrication. For purposes of this section the following definitions apply:

1. **Plagiarism.** *The adoption or reproduction of ideas, words, statements, images, or works of another person as one's own without proper attribution,*
2. **Cheating.** *Using or attempting to use unauthorized materials, information, or aids in any academic exercise or test/examination. The term academic exercise includes all forms of work submitted for credit or hours,*
3. **Fabrication.** *Unauthorized falsification or invention of any information or citation in an academic exercise.*

If you observe or learn about a violation of academic integrity, it is your responsibility to report it. I will employ all means available to identify academic misconduct—including electronic plagiarism detection.

ETSU Student Disciplinary Policies, Part 3 Academic and Classroom Misconduct, Numbers 2 and 3, states:

(2) Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the university's academic misconduct policy as a result of academic misconduct, the instructor has the authority to assign an "F" or a zero ("0") for the exercise or examination, or to assign an "F" in the course.

(3) Students may appeal a grade assignment associated with a finding of academic misconduct, as distinct from a student disciplinary sanction, through the university's academic misconduct procedure. Courses may not be dropped pending the final resolution of an allegation of academic misconduct. (See Part 6 Disciplinary Procedures, Paragraph (6) Academic Misconduct Procedures).

Given these definitions and restrictions, this course will enforce the following policies regarding academic integrity violations.

- The **first offense** of academic misconduct will result in a grade of zero ("0") on the exercise or examination. A notice will be sent to the student, to the Office of the Dean in the College of Business and Technology, and to the Chair of the Department of Computing.

- The **second offense** of academic misconduct will result in a grade of “F” for the course. A notice will be sent to the student, to the Office of the Dean in the College of Business and Technology, and to the Chair of the Department of Computing.

Be aware that ETSU Academic Misconduct Procedures state: **“For a second academic misconduct offense the penalty may be permanent expulsion from the University.” A zero received as the result of academic misconduct cannot be dropped as a “lowest grade” under any circumstances.** If you share your work with someone who copies your work, BOTH PARTIES are subject to the penalty for academic misconduct without regard to who copied whom. Know and understand your right to appeal.

Other Issues

Computer Lab Use

The use of computer labs is governed by the Department of Computing Lab Policies. You should familiarize yourself with these policies.

The Grade of Incomplete

In general, the grade of incomplete is only given in the cases of serious, uncontrollable situations that will prevent the student from completing the assigned coursework. A request for a grade of incomplete must be submitted in writing with the reason for the request and any appropriate documentation. I reserve the right to discuss your request with the department chair and/or other instructors. Remember that an incomplete could have financial aid implications; check into those issues before you make a request.

Instructor Communication Policy

I expect you to interact with me as often as necessary regarding the course material. Assignment due dates are given to ensure ample time to complete the tasks. If you are stuck on a task, do not wait until the due date to contact me. I will respond to electronic communications as I am able. If you contact me after 8:00pm on a weeknight, or on the weekend, you might not receive a response until the following weekday morning.

Please take note of my posted office hours and visit as often as necessary. Plan your communication with me accordingly.

General Course Guidelines

1. Check the D2L site and your ETSU email account frequently. I post announcements throughout the week, so if you have a question, you may want to check there first. By default, all course communication will be through the D2L site—and, in conjunction, your ETSU email address.
2. The course schedule is provided as a suggested outline. It will remain fluid throughout the semester to give extra time on certain concepts, account for any University closings, or provide a better information flow. Any due date or examination date is subject to change.
3. I will provide grade sheets as appropriate to let you know where you stand throughout the semester.
4. Be courteous during class.
 - a. Do not talk over other people and be respectful of your classmates’ opinions and questions.
 - b. If you have a question, ask at the earliest opportunity!
 - c. Come to class on time and leave on time.
 - d. Have fun! AI is a really interesting topic, so enjoy exploring it!
5. Each student is expected to spend a minimum of 2-3 hours outside class for each hour spent inside class. Since we are in class 3 hours per week, this indicates 6-9 hours of outside involvement. This may include working on labs and projects, studying concepts, and preparing for exams.
6. Come to lectures prepared to learn and interact. I am much more effective as a professor if we have conversations in class. You will gain more from the material if you discuss it with others during the semester. I encourage discussion of the concepts with your classmates and teammates. However, all individually assigned work must be your original creation.
7. I will grade your assignments as promptly as possible—usually within one week after the due date.