



EAST TENNESSEE STATE UNIVERSITY

Department of Computing

CSCI 4220 – INTRO TO ARTIFICIAL INTELLIGENCE

COURSE SYLLABUS

COURSE INFORMATION

INSTRUCTOR

Brian T. Bennett, Ph.D.
*Department Chair
Professor*

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SECTION INFORMATION

CSCI 4220-201 Introduction to Artificial Intelligence (CRN: 83681)

Monday, 5:30 PM to 7:30 PM
Brinkley Center 225

**Labs will be conducted asynchronously.

CATALOG DESCRIPTION

Prerequisite: C- or better in CSCI 2210 (or CSCI 2240)

Explore the foundational concepts and applications of Artificial Intelligence (AI). Learn to apply AI principles in various domains, develop AI-based solutions, and understand the ethical considerations in AI. Topics may include knowledge representation, logic, problem-solving, search algorithms, heuristic functions, game theory, learning, planning, and intelligent agent design. Suitable for anyone with a background in programming, this course prepares for advanced studies and careers in AI and data analytics.

LEARNING OUTCOMES

At the completion of this course, Undergraduate Students are expected to do the following.

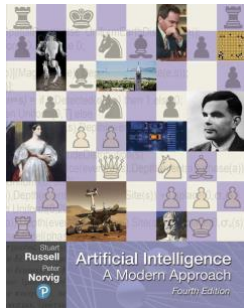
1. Demonstrate a fundamental understanding of the history of artificial intelligence (AI) and its foundations.
2. Apply basic principles of AI in solutions that require problem-solving, inference, knowledge, learning, and planning.
3. Demonstrate a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, rule-based systems, and other AI-based systems.
4. Argue and apply AI ethics, laws, and guidelines to AI intelligent models
5. Critique and defend an AI model's scopes, limitations, and societal implications.
6. Develop AI applications and tools using AI language, expert systems, or mining tools.

MAJOR TOPICS

- Definition and principles of intelligent agents, search functions and heuristic search, AI planning, and inference.
- Uninformed and adversarial search
- Heuristic Search (A*) and functions
- Propositional Logic Inference
- First-Order Logic
- Rule-Based Systems
- Search-based Planning
- Decision Theory
- Artificial Intelligence Ethics

COURSE MATERIALS

TEXTBOOK – RECOMMENDED



[AIMA] Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach, 4th Edition*, Pearson. ISBN: 978-0-13461-099-3

Exercises within the book are freely available online via <https://aimacode.github.io/aima-exercises/>.

Other written reference materials may be used as needed during the semester but will be provided.

TECHNOLOGY RESOURCES

Completing programming projects will require the **Python 3 programming language**. Likely, the best way to get Python 3 and the appropriate software libraries to be used this semester is by obtaining the following:

- **Anaconda Individual Edition:** <https://www.anaconda.com/products/individual>
 - Be sure to obtain the version for Python 3.x.

This offers only a brief introduction to the Python programming language. It is expected that students taking Computer Science courses can quickly learn a programming language if it is unfamiliar. If you are new to the Python programming language, aside from general syntax, you need to learn about the following language features:

- Numpy and Pandas basics, Lists and List Comprehensions, Sets, Tuples, Dictionaries
- Some libraries will be covered during project work.

For a beginner's tutorial to Python, visit <https://www.learnpython.org/>.

COURSE FORMAT AND EVALUATION POLICIES

COURSE FORMAT

This course is intended as a hybrid survey of Artificial Intelligence. In-person attendance is expected on Mondays, which will be used for lecture and discussion. Laboratory exploration will be outside class time.

All course materials and assignments will be available (or linked) through the course website: <https://elearn.etsu.edu>. **You should check this site often for updates and announcements.** *A tentative course schedule is provided separately and may change throughout the semester to allow extra time for concepts or accommodate university scheduling.*

GRADING POLICIES

GRADE SCALE

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
≥ 93	90- 92.999	87- 89.999	83- 86.999	80- 82.999	77- 79.999	73- 76.999	70- 72.999	67- 69.999	60- 66.999	< 60

DEFINITION OF GRADE LEVELS

The following definitions will apply to the grading scale. Note that “C” is considered average. To achieve a mark of B or A, you must demonstrate above average or exceptional as described below. Computing students are expected, in general, to achieve a 2.5 grade-point average (a C+) in their programs of study.

Letter	Description	Numeric Equivalent	
A	<u>Exceptional</u> . Able to define terminology, perform analysis of topics, and synthesize information by relating topics from different domains. Performs exceptionally in project work by going above and beyond the minimum requirements consistently.	A+	100%
		A	93%
		A-	90%
B	<u>Above Average</u> . Able to define basic terminology associated with the course content and perform analysis of topics in the same domain. Performs work toward the goals of a project. Occasionally goes above the minimum requirements.	B+	87%
		B	83%
		B-	80%
C	<u>Average</u> . Able to define basic terminology associated with the course work. Performs work in projects but does not demonstrate above average work.	C+	77%
		C	73%
		C-	70%
D	<u>Below Average</u> . Marginal performance indicating minimal understanding and significant areas needing improvement. Projects or labs exhibit minimal effort or understanding, with significant issues in execution or documentation. Basic requirements are barely met.	D+	67%
		D	60%
F	<u>Poor</u> . Provides few insights into course materials. Performs minimal work or performs work very poorly.	F	40%
		Zero	0%

EVALUATION POLICY

The final grade in the course is based on your understanding of AI theory and AI application. These are broken into four main categories: Exams, Quizzes, Programming Projects, and Labs. The percentage breakdown follows:

THEORY (50%)		APPLICATION (50%)	
Exams	Quizzes	Programming Projects	Labs
35%	15%	30%	20%

EXAMS

You will take two exams during the semester. Exams will assess understanding of the course content. A midterm exam will occur near the semester's mid-point and count 15% of the final grade. A comprehensive final exam will occur during the scheduled final exam period and will count for 20% of the final grade.

QUIZZES

Quizzes are knowledge checks that will occur periodically during the semester. Expect a quiz about every two weeks. You may make up missed quizzes with prior permission. The quiz average comprises 15% of the final grade.

PROGRAMMING PROJECTS

Programming projects are multi-week assignments that ask you to explore concepts and apply them with code more deeply than labs. Projects involve developing and using Artificial Intelligence algorithms to solve specific problems.

LABS

Labs are smaller-scale assignments designed to introduce the application of concepts covered in the content. The labs will likely help you practice concepts before applying them to a project. Typically, you will have one lab assignment each week. You only need to complete 7 labs during the semester. **ONLY THE FIRST 7 LABS YOU SUBMIT WILL BE GRADED.** Submitting more than 7 labs will not boost your grade.

ATTENDANCE POLICY

Regular, on-time class attendance and participation in class and labs is expected. Students arriving late create a distraction for other students and waste their time. Respect for others requires being in place and ready to begin at the scheduled time.

For class sessions where quizzes are given, quizzes will typically begin at the designated class starting time and will be available for students for the first few minutes of class. Students arriving late may not be able to take the quiz unless a makeup quiz is arranged (see the Makeup Work Policy).

When students miss class, they must find out what material they missed and be prepared for upcoming class elements. Students missing days when assignments are discussed should consult other students or refer to D2L for assignment requirements. Contact with the Professor is also expected. Due dates are not adjusted for absences unless extenuating circumstances exist.

GRADE DEDUCTIONS FOR EXCESSIVE ABSENCES

0-3 Absences	No deduction
4-5 Absences	One Partial Letter Grade Decrement (A becomes A-, A- becomes B+, B+ becomes B, etc.)
6+ Absences	One Full Letter Grade Decrement (A becomes B, A- becomes B-, B+ becomes C+) for each absence.

MAKEUP AND INCOMPLETE POLICY

MAKEUP WORK

All work is due at the date and time specified in D2L (typically noted on the Dropbox). If the due date or time changes for any reason, you will be notified either via email or D2L (or both).

Accepting makeup work is at the instructor's discretion. In general, flexibility will be granted *only* in situations with significant extenuating factors. **When something comes up, you must notify me as soon as possible to consider a makeup.** Unless the situation prohibits it, you must notify me before the assignment's due date. You should make every reasonable attempt to complete work on time to ensure proper progress through the course.

THE GRADE OF INCOMPLETE

The Undergraduate Grading Policy defines Incomplete Grades as follows:

An instructor may assign a grade of "I" (incomplete) only when a student has successfully completed seventy-five percent (75%) of the required work for a course, but due to circumstances beyond the student's control, the student is unable to complete course requirement(s). The "I" grade also indicates that the student has received consent from the instructor to complete the course requirements. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course.

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 other university employees or instructors. Remember that an incomplete could have financial aid or graduation implications; check into those issues before you make a request.

COMMUNICATION POLICY

Students must make every reasonable effort to contact the instructor as soon as possible to discuss any issues. **Please make an appointment as soon as possible for more complex issues.**

Electronic communication **via email OR Discord** is the best way to get in touch. Email or Discord should be used to ask simple questions. If you have questions about your code, please include the code in your email message. **You should expect a response within 1-2 business days.** You will likely not receive responses to electronic communications late at night, early in the morning, or on weekends. *You will not receive a response to questions about an assignment within 12 hours of the due date/time unless it is related to a submission problem. In other words, start early so you have ample time to finish and to ask questions.* **If you do not receive a response within 2 business days, reach out again to ensure I have not missed your note.** Complex questions should be addressed in a meeting rather than through email.

DISABILITY SERVICES POLICY

It is the policy of ETSU to accommodate students with disabilities, pursuant to federal law, state law and the University's commitment to equal educational opportunities. Any student with a disability who needs accommodations, for example note taking assistance, exam time adjustment or seating placement, should meet with Disability Services. Faculty accommodation forms are provided to eligible students and should be shared with the instructor as early in the semester as possible. Disability Services can be reached via telephone at (423) 439-8346 or web at <https://www.etsu.edu/students/ds/>.

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."

STATEMENT ON THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE

If you use generative AI tools, such as ChatGPT, Claude, Copilot, etc., for inspiration or guidance, please be transparent about this by providing a citation and briefly explaining how you used the tool. You can learn more about how to cite your AI usage properly via this link: <https://libguides.umn.edu/c.php?g=1314591&p=9664746>. If you are unsure whether your use falls within acceptable boundaries, contact the instructors well before the due date to consult. Remember that you can also ask me for guidance when you have questions.

The best rule of thumb is this: If you rely on AI to think *for* you, then you are not getting the learning benefits of this class. This not only cheats you out of what you are paying to learn in this class but potentially cheats your

future coworkers, clients, and others of the expertise they'll assume you have. Thinking is effortful, but the benefits are well worth it!

Using generative AI to produce code or written content will not be tolerated and will be considered academic misconduct unless an exception is specified in the assignment requirements. Using generative AI tools to provide inspiration and guidance is an acceptable use of this technology. If it substantially contributes to your work, you must cite it as noted above, or it will also be considered academic misconduct. Generative AI must not replace your ability to solve the problems presented in this class.

We reserve the right to use AI detection mechanisms that indicate a problem with your submission and the need for further investigation.

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, located at

<https://www.etsu.edu/policies/documents/academic-integrity-and-misconduct-policy.pdf>

The University defines academic misconduct as follows:

Any act of dishonesty that attempts to gain, helps others to gain, attempts to help others to gain, or helps others to gain an unfair Academic Advantage in all aspects of academic work in or out of the classroom. Academic Misconduct includes plagiarism, self-plagiarism, cheating, collusion, impersonating someone or allowing yourself to be impersonated, and/or fabrication, falsification, or misrepresentation, and failure to meet legal, ethical and professional obligations, or an unauthorized use of generative artificial intelligence.

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.

This course will enforce the following policies regarding academic misconduct violations.

- The **first offense** of academic misconduct will result in a reduction of one letter grade. A becomes B, B becomes C, C becomes F. A notice will be sent to the student, to the Office of the Dean of Graduate School, and to the Chair of the Department of Computing. University-wide records are kept for academic misconduct, and this offense will be reported through appropriate channels.
- 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 of Graduate School, and to the Chair of the Department of Computing. University-wide records are kept for academic misconduct, and this offense will be reported through appropriate channels.

Be aware that ETSU Academic Misconduct Policy states: **“If there are previous records of Academic Misconduct offenses or if the charge is serious enough, the dean/designee will determine if additional sanctions may be warranted through a hearing board and if it may reach the level of Academic Integrity Probation, Suspension, or Academic Integrity Dismissal.”**

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.

GENERAL COURSE GUIDELINES

1. **Check the D2L site and your ETSU email account frequently.** Announcements may be posted throughout the week. 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 allow extra time on certain concepts or improve information flow.

3. **Grade sheets may be provided as appropriate via encrypted email directly to your ETSU email address** to let you know where you stand throughout the semester. All assignments will be graded as assessments or rubrics in D2L.
4. **Be in class on time and participate in the discussion!**
5. **In general, you should expect to spend 2-3 hours each week working on content, and another 4-6 hours working on assignments.** Budget your time appropriately.
6. **Assignments will be graded as promptly as possible**—usually within one week after the due date.