George Mason University  
College of Engineering, School of Computing  
Department of Computer Science

CS 580 Introduction to Artificial Intelligence

**Meeting time:** Thursday 4:30 pm – 7:10 pm  
**Meeting location:** Online on Blackboard

**Instructor:** Dr. Gheorghe Tecuci, Professor of Computer Science

**Office hours:** Online by appointment, for questions unrelated to the course. Course-related questions will be addressed during the course online meetings.

**E-mail:** tecuci at gmu dot edu

**Graduate Teaching Assistant:** Sivani Tadepalli, Ph.D. Student  
**E-mail:** stadepal at gmu dot edu  
**Office hours:** Online, by appointment

**Course Description**

Artificial Intelligence is the Science and Engineering domain which is concerned with the theory and practice of developing systems that exhibit the characteristics we associate with intelligence in human behavior, such as reasoning, problem solving and planning, learning and adaptation, natural language processing, and perception. This course presents the basic principles and the major methods of Artificial Intelligence, preparing the students to build complex systems incorporating capabilities for intelligent processing of information. Covered topics include: heuristic search, constraint satisfaction, adversarial search, knowledge representation, logic and probabilistic reasoning, statistical learning, knowledge engineering and cognitive assistants. The students will also learn about the Disciple agent development environment created in the Learning Agents Center of George Mason University, as well as other artificial intelligence tools, such as the Weka machine learning workbench. Students will have accounts on Blackboard and can download the lecture notes by going to courses.gmu.edu and logging in using their Mason ID and passwords.

**Online Teaching and Class Participation**

This is a **synchronous** online class and your class attendance is **required**.  
Classes may contain graded quizzes that can only be taken during the online class session. If, for any reason, you anticipate not being able to attend any of the class sessions you should not register for this course.

A few days before each class meeting the recorded lectures will be posted on Blackboard. Your assignment is to watch them before the meeting. The classes will generally start with short graded quizzes testing that you have watched the recordings. There will be other graded quizzes testing the **understanding** of previously discussed topics.

During the class meetings I will only answer questions about the posted lectures and solve problems to help your understanding.
Course Topics

- Overview of Artificial Intelligence and Intelligent Agents
- Problem Solving as Search
- Constraint Satisfaction Problems
- Adversarial Search
- Logic and Production Systems
- Resolution and Prolog
- Ontologies
- Semantic Web
- Probabilistic Reasoning Basics
- Bayesian Networks Inference and Learning
- Machine Learning Basics
- Inductive Learning of Decision Trees
- Very Fast Decision Trees
- Instance-based Learning
- Clustering
- Neural Networks
- Deep Learning
- Evidence-based Reasoning
- Instructable Cognitive Agents

Outcomes

- Knowledge of and ability to apply uninformed and heuristic search methods;
- Knowledge of and ability to apply knowledge representation and reasoning methods based on first-order logic;
- Knowledge of and ability to apply basic probabilistic reasoning methods;
- Knowledge of and ability to apply basic machine learning methods.

Grading Policy

- Assignments and Quizzes: 20%
- Mid-term exam: 40%
- Final exam: 40%

Monitored Quizzes and Exams

We will employ the LockDown Browser (https://web.respondus.com/he/lockdownbrowser/) and the Respondus Monitor (https://web.respondus.com/he/monitor/).

Each student is required have two devices:

- A computer prepared for Blackboard Respondus (with microphone and video camera connected to the computer).
- A ZOOM connection (may be on a mobile device – phone, iPad or on another computer).
The quizzes and the exams must be taken in a quiet, isolated room, looking at the screen. If the student looks in a different direction and/or speaks during the quiz or exam, the exam/quiz will be disregarded and 0 points will be awarded.

The ZOOM device must point from a short distance to the workplace showing the computer monitor, student hands and surroundings.

**Exam Dates** (mark your calendar)
- Mid-term exam: 10/14/2021
- Final exam: 12/9/2021

**Honor Code Policy**
Mason is an Honor Code university. You are expected to abide by the University's honor code (http://oai.gmu.edu/mason-honor-code/), as well as the CS department Honor Code (http://cs.gmu.edu/resources/honor-code/). Any collaboration between students on assignments or exams is unacceptable.

**Required Reading**
- Tecuci G., *Lecture Notes in Artificial Intelligence*, 2021 (available on Blackboard)

**Recommended Reading**

**Other Readings**
Email Communication
- For all the issues related to the course, always email to both tecuci at gmu dot edu and stadepal at gmu dot edu
- You are required to always use your Mason email and include CS580 in the subject.
- Do not sent us email through Blackboard.

Mason Email Accounts
Students must activate their Mason email accounts to receive important University information, including messages related to this class.

Office of Disability Services
If you are a student with a disability and you need academic accommodations, please see Dr. Tecuci and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS (http://ds.gmu.edu/).

Other Useful Campus Resources
- Writing Center: A114 Robinson Hall; (703) 993-1200; http://writingcenter.gmu.edu
- University Libraries “Ask a Librarian” http://library.gmu.edu/ask
- Counseling and Psychological Services (CAPS): (703) 993-2380; https://caps.gmu.edu/

University Policies
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university affairs. You may also review the University Policy web site, http://universitypolicy.gmu.edu/