CMSC471 **Artificial Intelligence** Fall 2005

Section 0101 TuTh 5:30 - 6:45pm ACIV011

Instructor:

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TA:

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Office Hour: MW 3:00 – 4:00

Texts:

Stuart Russell and Peter Norvig, *Artificial Intelligence - A Modern Approach*, Prentice Hall, Second Edition, 2003.
Supplementary materials (papers, book chapters and web pages) for selected topics.

Course Description:

This course is designed as a broad rather than in-depth introduction to the principles of artificial intelligence, its characteristics, major techniques, and important sub-fields and applications. Although some theoretical issues and mathematical derivations and proofs will be involved, the emphasis will be on understanding basic AI concepts and techniques, important ideas and issues. Students are expected to have basic knowledge of data structures, mathematical logic, and elementary probability theory. Knowledge of algorithm analysis and experience with Lisp programming are helpful.

The lectures will be divided into the following three parts:

Introduction (Chapters 1 & 2)

- Motivations and characteristics of AI

General-purpose AI problem-solving techniques}

- Heuristic search (state-space and A* search, game-tree and alpha-beta pruning, constraint satisfaction problems, etc.) (Chapters 3 - 6)
- Knowledge representation and reasoning (first-order-logic and automatic deduction, other representation paradigms such as rule-based systems, semantic nets and frame systems, forward and backward chaining) (Chapters 7 – 10)

Advanced topics and Applications

- Planning (Chapters 11 & 12)
- Uncertainty and probabilistic reasoning (certainty factors in rule-based systems, simple Bayesian systems, Bayesian belief networks, fuzzy set theory) (Chapters 13 & 14)
- Learning and knowledge acquisition (Chapters 18 – 21)

Grading: Course grading will be based on the following work:

Home works	10%
Project 1	10%
Project 2	15%
Project 3	15%
Exam 1	25%
Exam 2	25%

Note on projects:

- Project 1 is an exercise of Lisp. You may use any programming language for Projects 2 and 3.
- For each project, you are required to submit a short written report as well as a hard copy of your source code and the output of the code execution.
- You must submit your project by the end of the class time on the due day. Projects submitted after that time will be considered late. A 20-point (out of 100) penalty will be applied to all projects that are late up to one week. No projects later than one week will be accepted.

Academic Integrity

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory.