Computer Science CSC 440
Artificial Intelligence

CREDITS AND CONTACT HOURS: Credit Hours: 3 Contact Hours: 42

INSTRUCTOR:
Dr. Andrew Watkins

a. Supplemental Material: Articles, texts, and online videos provided by instructor

SPECIFIC COURSE INFORMATION:
a. Catalog Description: This course will serve as an introduction to artificial intelligence concepts and techniques. Specific topics include a historical and philosophical perspective on AI, the agent paradigm, search techniques, game playing, knowledge representation and reasoning, logic systems, uncertain reasoning and Bayes nets, planning, and machine learning. Time permitting, special topics in the instructor’s research interests will be covered.
b. Prerequisites: CSC 245
c. Required/Elective:
   Computer Science – Required
   Software Engineering – Selected Elective

SPECIFIC GOALS OF THE COURSE:
a. Specific Outcomes of Instruction:
   1. To develop an understanding of AI as a field and discipline
   2. To develop depth of exposure to a few subfields within AI
   3. To function on a team to develop an AI experiment/system
   4. To present results to a wide audience
   5. To develop an understanding of search and search problems
   6. To understand reasoning and reasoning under uncertainty
   7. To develop a basic understanding of planning
   8. To have experience working with machine learning techniques
   9. To have exposure to related fields/techniques such as bio-inspired computational techniques and simulation/modeling techniques
b. CAC Criterion 3 Outcomes Addressed by this course:
   b. An ability to apply knowledge of computing and mathematics appropriate to the program’s student outcomes and to the discipline
c. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
d. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
i. An ability to use current techniques, skills, and tools necessary for computing practice.
j. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

c. EAC Criterion 3 Outcomes Addressed by this course:
   a. An ability to apply knowledge of mathematics, science, and engineering
   c. An ability to design a system, component, or process to meet desired needs within
   k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

TOPICS COVERED:
1. Uninformed Search
2. Heuristic Search
3. Adversarial Search
4. Probabilistic reasoning
5. Reinforcement learning
6. Supervised learning
7. Unsupervised learning
8. Neural networks
9. Genetic Algorithms
10. Other biologically-inspired models of computing
11. Project work
12. Project presentations
13. Quizzes