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| **Syllabus – CS 461, Introduction to Artificial Intelligence**  **Fall 2018** |

**Instructor Information**

* Brian Hare
* Associate Teaching Professor
* Computer Science Electrical Engineering
* [hareb@umkc.edu](mailto:hareb@umkc.edu)   
  816.235.2362  
  Email is the best way to contact me. If the email involves your class grades or performance, I will only send email about this class to your UMKC email address.
* Class Meeting Time/Place: MWF 11:00 – 11:50, EDUC 243
* Semester Offered: Varies
* Instructor Office Hours and Office Location:

450E Flarsheim Hall   
Office hours: As posted on Blackboard

You can also use the UMKC Connect tool (through Blackboard) to schedule an appointment.

**Catalog Information:**

Course Description: **COMP-SCI 461 Introduction to Artificial Intelligence Credits: 3**

This course provides an overview of the field of artificial intelligence. Topics include guided and unguided search, adversarial search, generation and use of heuristics, logic programming, probabilistic reasoning, and neural networks. Application areas studied include game playing, automated proofs, expert systems, and data mining. One or more of CS 394R, CS 404, or an advanced programming elective are recommended.

**Prerequisites:** COMP-SCI  303 or equivalent.

* Restrictions/Exclusions: You must be a student in the School of Computing & Engineering to take this course. Exception can be made with instructor permission.
* Course Attributes/format: Classroom based, lecture

**Course Information**

* Required Materials:

Artificial Intelligence: A Modern Approach, 3rd Edition, by S. Russell & P. Norvig. Publisher: Pearson. **ISBN-10:** 0136042597 **ISBN-13:** 978-0136042594  
Available hardbound, various E-formats for purchase or rental. Which format you choose is up to you, but you **will** need access to the text.

* Evaluation and Grading Criteria:
  + 90%+: A
  + 80-89%: B
  + 70-79%: C
  + 60-69%: D
  + Below 60%: F
  + Assignment weightings given below.
* Schedule of Course Topics Covered:
  + Week 1: Chapt 1, 2 (Introduction, history; intelligent agents)
  + Week 2: Searching strategies (chapt 3, 4)
  + Week 3: Adversarial search (Chapt 5)
  + Week 4: Constraint satisfaction (Chapt 6)
  + Week 5-7: Logical agents (Chapt 7), First-order logic, Forward & Backward Chaining, Resolution (chapt. 8, 9)
  + Week 8: Quantifying uncertainty (Chap. 13)
  + Week 9-10: Probabilistic reasoning (Chap 14, 15)
  + Week 11-13: Machine learning: Neural Networks (18, 21)
  + Week 14: Ethics & Risks of AI, societal implications
  + Week 15: Course wrap-up; further topics as time permits
* Assignments, Requirements, and Assignment Deadlines:
  + 1 midterm exam about week 8 (15% of course grade)
  + Final exam (15% of course grade)
  + Programming assignments (student choice of C++, C#, Java, Python) demonstrating: constrained search, Bayesian reasoning, resolution, neural networks. Projects may use predefined libraries/packages such as WEKA as infrastructure. (2-4 projects, 40% of course grade)
  + 4-6 homework assignments/exercises (20% of course grade)
  + 5-8 in-class brief quizzes (10% of course grade)
* Meeting times, final exam time: Meeting times vary by semester; see Pathway for current information. Final exam will be given according to the schedule at <http://www.umkc.edu/registrar/registration/final-exam-schedule.asp>.

Student Learning Outcomes: At the conclusion of the course, the successful student will be able to:

·         Explain the principles of search, the role of heuristics in search, and how heuristics can be machine-generated

·         Demonstrate resolution using propositional and/or first-order logic

·         Demonstrate correct application of probabilistic reasoning

·         Correctly implement at least 2 of: unguided search, guided search, adversarial search, logic programming, planning, probabilistic reasoning, or classification via neural networks, choosing appropriate techniques and software tools for the problem at hand.

·         Discuss the ethical and societal implications of artificial intelligence

* This course is used to assess ABET criteria G and I:
  + An ability to analyze the local and global impact of computing on individuals, organizations, and society
  + An ability to use current techniques, skills, and tools necessary for computing practice
* Course Expectations, Course Policies, Requirements and Standards for Student Coursework and Student Behavior:
  + Course attendance: Students are expected to attend all class sessions. Any material discussed in class (whether in the textbook or not) is “fair game” for quizzes and exams. Repeated absences will affect the student’s ability to be successful.
  + Any arrangements for alternate exam dates, make-up exams, etc., must be made in advance and are allowed only for circumstances beyond the student’s control. Documentation of illness or other issue may be required.
  + Students are expected to review textbook or online material in advance and come to class prepared. Assignments will be posted on Blackboard and usually submitted via Blackboard.
  + All work submitted for a grade is to be the student’s own, original, unaided work. Exceptions (group projects, etc) will be announced in class. Any outside sources (web resources, code repositories, etc) must be given proper acknowledgement in any submitted work. Documentation details will be discussed in class.
  + SCE policy will be followed in cases of suspected academic dishonesty. Academic dishonesty includes cheating (unauthorized resources or assistance on homework, quizzes, or exams), plagiarism (submitting the work of others under one’s own name), and sabotage (interfering in the work of others). These terms are discussed in detail, and procedures followed in suspected cases of academic dishonesty explained, on the Blackboard site for the course.

Various administrative stuff (Nondiscrimination policy, ADA accommodations, classroom recording policies, etc.) deleted for space.