



## Syllabus – CS 461, Introduction to Artificial Intelligence Spring 2017

### 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 12:00 – 1:00 PM, Haag 109
- Semester Offered: Spring
- Instructor Office Hours and Office Location:  
450E Flarsheim Hall  
Office hours: TTh 3:30 – 5:00, or by appt.  
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**

Search space generation, pruning and searching, employment of heuristics in simulation of the cognitive process, an overview of predicate calculus, automatic theorem proving.

**Prerequisites:** COMP-SCI 441 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, 3<sup>rd</sup> 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: Logical agents (Chapt 7)
    - Week 6-7: First-order logic, Forward & Backward Chaining, Resolution (chapt. 8, 9)
    - Week 8: Planning & acting (chapters 10,11)
    - Week 9: Knowledge representation (Chapter 12)
    - Week 10: Quantifying uncertainty (Chap. 13)
    - Week 11: Probabilistic reasoning (Chap 14, 15)
    - Week 12: Machine learning: Neural Networks (18, 21)

- Week 13: Machine Perception (Chap 24)
- 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 end of the course, the successful student will be able to:
  - Give a detailed description of search algorithms including windowing and pruning
  - Describe and demonstrate correct application of Bayesian reasoning
  - Discuss ethical and societal implications of artificial intelligence
  - Discuss principles & applications of natural-language processing
- 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.

Mutual expectations between students & instructor:

Faculty and Students are both deeply involved in the educational process and have mutual obligations and responsibilities. Students have a right to complain about unprofessional behavior, out-of-date information or watered-down standards that make their degree meaningless. Students do not have a right to complain about being challenged to work hard or about being presented with facts or ideas that conflict with their preconceptions.

Here is what I expect from students:

- You will treat everyone in the class, including the instructor, with the respect due to all human beings.
- You will attend every class, give your full attention to the material, and conduct yourself in an appropriate manner.

- You will agree to do the work outlined in the syllabus on time.
- You will acknowledge that previous academic preparation (e.g., programming or math skills) will affect your performance in this course.
- You will acknowledge that your perception of effort, by itself, is not enough to justify a distinguished grade.
- You will not plagiarize or otherwise steal the work of others.
- You will not make excuses for your failure to do what you ought.
- You will accept the consequences -- good and bad -- of your actions.

Here is what students can expect from me:

- I will treat you with the respect due to all human beings.
- I will know your name and treat you as an individual.
- I will not discriminate against you on the basis of your identity or your well-informed viewpoints.
- I will manage the class in a professional manner. That may include educating you in appropriate behavior.
- I will prepare carefully for every class.
- I will begin and end class on time.
- I will teach only in areas of my professional expertise. If I do not know something, I will say so.
- I will conduct scholarly research and publication with the aim of making myself a more informed teacher.
- I will return your assignments quickly with detailed feedback. I will answer your questions to the best of my ability and work with you to help you learn.
- I will pursue the maximum punishment for plagiarism, cheating, and other violations of academic integrity.
- I will keep careful records of your performance and progress.
- I will make myself available to you for advising.
- I will maintain confidentiality concerning your performance.
- I will provide you with professional support and write recommendations for you if appropriate.
- I will be honest with you.
- Your grade will reflect the quality of your work and nothing else.
- I am interested in your feedback about the class, but I am more interested in what you learned than how you feel.

## Resources & Policy Statements

**Academic Calendar:** Students are encouraged to review important add, drop or withdraw dates:

<http://www.umkc.edu/registrar/acal.asp>

**Academic Honesty:** The Board of Curators of the University of Missouri recognizes that academic honesty is essential for the intellectual life of the University. Faculty members have a special obligation to expect high standards of academic honesty in all student work. Students have a special obligation to adhere to such standards. Academic dishonesty, including cheating, plagiarism or sabotage, is adjudicated through the [University of Missouri Student Conduct Code](#) and [Rules of Procedures in Student Conduct Matters](#).

## Academic Inquiry, Course Discussion and Privacy:

**Faculty allowing recording** - University of Missouri System Executive Order No. 38 lays out principles regarding the sanctity of classroom discussions at the university. The policy is described fully in [Section 200.015 of the Collected Rules and Regulations](#). In this class, students may make audio or video recordings of course activity unless specifically prohibited by the faculty member. However, the redistribution of any audio or video recordings of statements or comments from the course to individuals who are not students in the course is prohibited without the express permission of the faculty member and of any students who are recorded, including those recordings prepared by an instructor. Students found to have violated this policy are subject to discipline in accordance with provisions of Section 200.020 of the Collected Rules and Regulations of the University of Missouri pertaining to student conduct matters.

**Attendance Policy:** Students are expected to attend and participate in classes. Advance notice of attendance policies of academic units and individual instructors should be given, and such notice should be in writing. Students should notify instructors of excused absences in advance, where possible. Students who have an excused absence are expected to make arrangements with instructors for alternative or make-up work. Such arrangements should be made in advance of the absence, where possible. Instructors should accommodate excused absences to the extent that an accommodation can be made that does not unreasonably interfere with the learning objectives of the course or unduly burden the instructor. Attendance policies shall be applied in a non-discriminatory manner.

**Campus Safety:** Inclement weather, mass notification, and emergency response guide:

<http://www.umkc.edu/umkcalert/>

**Counseling and Health Services Available at UMKC:** UMKC students may experience many challenges in their lives while attending college – stress, depression, suicidality, trauma, relationship issues, health concerns, etc. As your professor I care about your success and well-being, and want to make you aware of some helpful resources on campus. The UMKC Counseling Center ([www.umkc.edu/counselingcenter](http://www.umkc.edu/counselingcenter)), located at 4825 Troost in Room 206, offers a wide range of supportive services to students. Appointments can be made by calling 816.235.1635. UMKC Student Health and Wellness (<http://info.umkc.edu/studenthealth/>), located at 4825 Troost in Room 115, offers a full range of health care and promotion services. Appointments can be scheduled online or by calling 816.235.6133. The MindBody Connection ([www.umkc.edu/mindbody](http://www.umkc.edu/mindbody)) is located in the Atterbury Student Success Center in Room 112 and offers a variety of stress-reduction services.

**Disability Support Services:** To obtain disability related accommodations and/or auxiliary aids, students with disabilities must contact the Office of Services for Students with Disabilities (OSSD) as soon as possible. To contact OSSD, call (816) 235-5696. Once verified, OSSD will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. For more information go to: <http://www.umkc.edu/disability/>

**English Proficiency Statement:** Students who encounter difficulty in their courses because of the English proficiency of their instructors should speak directly with their instructors. If additional assistance is needed, students may contact the UMKC Help Line at 816-235-2222 for assistance.

**Grade Appeal Policy:** Students are responsible for meeting the standards of academic performance established for each course in which they are enrolled. The establishment of the criteria for grades and the evaluation of student academic performance are the responsibilities of the instructor.

The [University grade appeal procedure](#) is available only for the review of allegedly capricious grading and not for review of the instructor's evaluation of the student's academic performance. Capricious grading, as that term is used here, comprises any of the following:

- The assignment of a grade to a particular student on some basis other than the performance in the course;
- The assignment of a grade to a particular student according to more exacting or demanding standards than were applied to other students in the course; (Note: Additional or different grading criteria may be applied to graduate students enrolled for graduate credit in 300- and 400-level courses.)
- The assignment of a grade by a substantial departure from the instructor's previously announced standards.

**Discrimination Grievance Procedures for Students:** Discrimination Grievance Procedures for Students can be found here: [http://www.umsystem.edu/ums/rules/collected\\_rules/grievance/ch390/grievance\\_390.010](http://www.umsystem.edu/ums/rules/collected_rules/grievance/ch390/grievance_390.010)

**Statement of Human Rights:** The Board of Curators and UMKC are committed to the policy of equal opportunity, regardless of race, color, religion, sex, sexual orientation, national origin, age, disability and status as a Vietnam era veteran. Commitment to the policy is mentored by the [Division of Diversity, Access & Equity](#), but it is the responsibility of the entire university community to provide equal opportunity through relevant practices, initiatives and programs.

**Title IX:** Under the University of Missouri’s Title IX policy, discrimination, violence and harassment based on sex, gender, and gender identity are subject to the same kinds of accountability and support applied to offenses based on other protected characteristics such as race, color, ethnic or national origin, sexual orientation, religion, age, ancestry, disability, military status, and veteran status. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting UMKC’s Title IX Office webpage (<http://info.umkc.edu/title9/>) or contacting UMKC’s Title IX Coordinator, Mikah K. Thompson (816.235.6910 or [thompsonmikah@umkc.edu](mailto:thompsonmikah@umkc.edu)). Additionally, you can file a complaint using UMKC’s online discrimination complaint form, which is located at <http://info.umkc.edu/title9/reporting/report-online/>.

While most UMKC employees are required to report any known or suspected violation of Title IX, students may seek confidential guidance from the following campus locations:

<b>UMKC Counseling Service Volker Campus</b> 4825 Troost Ave, Suite 206 Kansas City, MO 64110 Phone – (816) 235-1635	<b>UMKC Counseling Service Health Sciences Campus</b> Health Sciences Building 1418 2464 Charlotte Kansas City, MO 64108 Phone – (816) 235-1635 (open Tuesdays, 1-5pm)	<b>Student Health and Wellness</b> 4825 Troost Ave., Suite 115 Kansas City, MO 64110 Phone - (816) 235-6133
---	---	--

**UMKC Connect:** Important information is available to undergraduate students in UMKC Connect accessed through Blackboard. Throughout the term, students may receive emails regarding course grades or academic performance. Students are expected to address information posted in a timely fashion. This information may be shared with the student’s Success Network made up his or her academic advisor(s) and other campus resources so that UMKC may fully support the student’s success.