



Computer Science Department
Course Syllabus
CS462 - Knowledge-based Systems

Catalog Description:	This course covers machine representation of judgmental knowledge and uncertain relationships, inference on inexact knowledge bases. It also introduces some concepts about rule-based systems, heuristics to search domain specific knowledge, automated planning systems, knowledge acquisition and explanation producing techniques.
Credit Hours:	3 Credit hours: 3 Lectures per week 0 Labs. per week 0 Recitation per week
Prerequisites:	CS340
Course Learning Outcomes:	<ol style="list-style-type: none">1. Being able to analyse the performance of search strategies;2. Being able to structure and represent knowledge using an appropriate representation formalism;3. Learn to work with a rule based programming environment;4. Learn to apply induction algorithms to extract knowledge from data (data mining);5. Learn different knowledge extraction methods.
Major Topics:	<ul style="list-style-type: none">- Overview, Knowledge-Based Systems, Reasoning about Knowledge- Knowledge based systems concepts.- Expert systems technologies.- Problem solving and reasoning.- Representing knowledge and drawing inferences.- Inductive reasoning.- Structured situation analysis.- Designing and documenting expert systems.- Uncertainty reasoning: Bayesian Networks, Fuzzy Logic, Truth maintenance- Reasoning with Constraints- Ontologies and Data Mining- Knowledge Discovery in Databases and Data Mining- Machine Learning: Decision Tree Learning, Inductive inference, Artificial Neural Networks
Text Books:	<ul style="list-style-type: none">• Required: Knowledge-Based Systems, Rajendra Akerkar, Priti Sajja, Jones & Bartlett Learning, 2010.• Required: Artificial Intelligence: A Modern Approach, S. Russell and P. Norvig, 2nd edition, Prentice Hall, 2002.• Optional: Essentials of Artificial Intelligence, Ginsberg, Morgan Kaufmann Publishers, 1993.• Optional: Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Luger, 5th edition, Addison Wesley, 2004.• Optional: Natural Language Processing and Knowledge Representation: Language for



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- Knowledge and Knowledge for Language, Iwanska and Shapiro, MIT Press, 2000.
- Optional: Knowledge Representation, Brachman, Levesque, and Reiter, MIT Press, 1992.
 - Optional: The Logic of Knowledge Bases, Levesque and Lakemeyer, MIT Press 2001.
 - Optional: Knowledge Representation and Reasoning, Brachman and Levesque, Elsevier, 2004.

Grading:

- ⊙ The grading scale for this course is:
 - . 95 - 100 A+ Passing
 - . 90 - 94 A Passing
 - . 85 - 89 B+ Passing
 - . 80 - 84 B Passing
 - . 75 - 79 C+ Passing
 - . 70 - 74 C Passing
 - . 65 - 69 D+ Passing
 - . 60 - 64 D Passing
 - . 0 - 59 F Failing
- ⊙ Final grades will be determined based on the following components:
 - . 60% Semester Work
 - . 40% Final Exam
- ⊙ Students may not do any additional work for extra credit nor resubmit any graded activity to raise a final grade.
- ⊙ Late submissions will not be accepted for any graded activity for any reason.
- ⊙ Students have one week to request the re-grading of any semester work.

Attendance Policy:

Students should attend 80% of the overall course hours taught in the semester as per the University regulations.

If a student fails to achieve this portion, he/she shall not be allowed to appear in the final exam and shall be awarded "DN" grade and repeat the course.

Cheating and Plagiarism Policy:

The instructor will use several manual and automated means to detect cheating and/or plagiarism in any work submitted by students for this course.

When a student is suspected of cheating or plagiarism, the instructor raises the issue to the disciplinary committee.



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Communications: Registered students will be given access to a section of the Blackboard Learning System for this course. Bb will be used as the primary mechanism to disseminate course information, including announcements, lecture slides, assignments, and grades.

Communication with the instructor on issues relating to the individual student should be conducted using CIS email, via telephone, or in person.