CS 5331 (Sections 003 & D03) Course Syllabus
Special Topics on Concepts in AI and Machine Learning Systems

Class Information
Semester/year: Spring 2016
Time: 8-9:20am
Location: EC 205
Class materials: See my web page under instruction

Instructor Information
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Course Information
Objectives: To introduce the concepts and techniques of Artificial Intelligence and Machine Learning in computational perspectives. This course combines two important courses: AI and Machine Learning with the aim to provide essential backgrounds for students who are interested in advanced Data Analytics and applied AI research and development. The course can be taken as a part of general graduate CS education, as grounding for further research in Big Data science, or to gain familiarity with AI and machine learning methods for applications in other fields.

Content: Essential concepts of practical artificial intelligence (AI) and machine learning systems. Topics include heuristic and constraint satisfaction problem-solving methods, knowledge representation (logic, rules and frames/conceptual network) and automated reasoning (logic-based, knowledge-based and object-based techniques). Concepts of machine learning will be introduced in AI perspectives of knowledge acquisition and data science; why machine learning; how it differs from other techniques. Selected machine learning topics include early concept learning, general-to-specific ordering and popular decision tree, Baysian and Reinforcement learning (depends on time). The course will emphasize both practical and theoretical aspects of AI and machine learning. Students will use existing tools in projects and will learn current research issues by reading, summarizing and presenting research papers (if time permits).

Prerequisite: CS 2382 (discrete mathematics), CS2413 (data structures and programming principles), CS3364 (design and analysis algorithms). Exposure to formal methods (e.g. logic, discrete maths) and database. Good statistical and mathematical background (e.g., probability theory, combinatorial or discrete math) are helpful. If you do not meet these prerequisites, be sure to discuss with the instructor before enrolling in the class.

Requirements: Students are responsible for attending lectures and readings of the topics being covered in the given relevant references. Students are encouraged and expected to participate in class discussions to a reasonable extent.

Texts: Class lecture materials.

References:
Expected Learning Outcomes:
1. Understanding of basic concepts of AI problems, what constitute intelligent systems and how to build them (MS-3, 5; PhD-5)
2. Basic knowledge of AI techniques: heuristic algorithms, knowledge representation and reasoning (MS-3, 5; PhD-5)
3. Understanding of basic concepts of machine learning systems and techniques (MS-3, 5; PhD-5)
4. Familiarity with existing tools with various machine learning systems (MS-3, 5; PhD-5)
5. Exposures to examples of real-world applications, research and communication skills (MS-1, 5; PhD-1, 5)

Methods of Learning Assessment: Assignments (homeworks, projects), a midterm exam, and a final assessment (either exam or project/presentation)

Evaluation:
- Assignments: 35%
- Mid-term exam: 30%
- Final assessment: 30%
- Class participation: 5%

Academic Integrity
Exam, assignments, and projects are subject to the university academic integrity (http://www.depts.ttu.edu/studentconduct/academicinteg.php) and the statement of academic conduct for engineering students (included in the last page of the syllabus). Consequences of dishonesty can be severe, and may include expulsion from the university.

Grading Policy
No assignment can be submitted for grades after the same assignment for the whole class has been graded and returned to class. In general, late submissions of assignments/projects will receive a 10% deduction from the points obtained for each day after the due date. Students may write to the professor to request considerations in really special situations (e.g., long-term illness, medical procedures). Assessment may be resubmitted for re-grading no later than one week after the assessment is returned. This is the only window of opportunity for re-grading. No re-grading will be given without comprehensive, written documentation by the student about the exact problem in the grading. Students must keep all graded assignments until the end of the course.

Students with Disabilities
Reasonable accommodations are available for students who have a documented disability. Please notify the Professor during the first week of class regarding accommodations needed for the course. Late notification may cause the requested accommodations to be unavailable. Students needing accommodations must first have them approved through the AccessTech of the Student Affairs program (www.studentaffairs.ttu.edu/accesstech).

Useful Resources
- KDNuggets (http://www.kdnuggets.com)
- UCI machine learning repository (http://www.ics.uci.edu) and KDD archive (http://kdd.ics.uci.edu/)

Distance Students:
1. Please send me your photo, e-mail address and contact number.
2. If you have questions regarding the class delivery and administration (e.g., exam proctoring, not having access in a timely matter), contact
   - Brent Guinn, director of distance learning (800) 692-6877 ext 249 or Brent.Guinn@ttu.edu or see http://www.de.ttu.edu/content/asp/contact_info.asp
Statement of Academic Conduct for  
Engineering Students, College of Engineering  
Texas Tech University

Preamble
The College's primary goal is to educate students to fill leadership roles as professionals aware of technology and its economic and political role in the world. Therefore, we strive to produce technically competent graduates who solve problems, are able to communicate and work well with others; are sensitive to the needs of society, are well-educated in the humanities as well as in the engineering disciplines, and maintain a high-level of ethical and professional conduct.

Policy
The College of Engineering fully subscribes to the Code of Student Conduct as published in the Texas Tech University's "Student Affairs Handbook." The Handbook states the following:

"The University is strongly committed to upholding standards of academic integrity. These standards require that students never present the work of others as their own.

Any student found to have committed the following academic misconduct is subject to the disciplinary sanctions outlined in Part IX, Section D "Disciplinary Sanctions":

1. Cheating
This violation includes, but is not limited to: (1) use of any unauthorized assistance or assisting others in taking quizzes, tests, or examinations; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignment(s); (3) the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff; (4) alteration of grade records; (5) bribing or attempting to bribe a faculty member to alter a grade.

2. Plagiarism
This violation includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also included the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

3. Instructor Responsibilities
The instructor in a course is responsible for initiating action in cases where there is an admitted act or convincing evidence of academic misconduct. Before taking such action, the instructor should attempt to discuss the matter with the student(s). If the suspected misconduct involved a final exam, the instructor should submit a grade of X until a reasonable attempt can be made to contact the student(s), after the end of the semester.

4. Instructor Sanctions
If academic misconduct is determined by the instructor, a failing grade shall be assigned to either the assignment in question or to the course grade. When a student is given a failing grade in a course as a result of academic misconduct, the instructor shall report in writing to the instructor's department chairperson the facts of the case and the action to be taken against the student. The chairperson shall provide a copy to the student, to his or her Academic Dean and to the Dean of Students Office.

5. Grade Appeal Procedure
The Grade Appeal Procedure (Part V, Section A) may be used to appeal a failing course grade, but not a failing grade given for a class assignment. The disciplinary penalty or grade of F shall not be implemented until the disciplinary procedures or grade appeal process has been exhausted. A student may continue the academic class and course work until a final decision is made."

6. Repeated Academic Dishonesty
In cases of repeated violations, either the instructor (through his or her department chairperson and/or Academic Dean's Office) or the Academic Dean may refer the case to the Dean of Students Office for further disciplinary action.