CSCI 527: Advanced Databases and Data Mining

INSTRUCTOR:

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Office Hours: Mondays 7:10 PM - 8:10 PM, Other Times By Appointment

CLASS MEETING TIMES:

Fridays 4:30 PM - 7:10 PM, JOUR104

TEXTBOOK:

Suh, Sang C. Practical Application of Data Mining. Jones and Bartlett Learning, 2011.

PREREQUISITES:

CSCI 526 or similar course in database design.

COURSE DESCRIPTION:

General theory, concept, and techniques related to intelligent database design are discussed in this course. Emphasis is placed on the statistical discovery of knowledge and structure in data stores. Additional topics to be covered include neural networks, multimedia, and text retrieval. A moderate-size semester project will be developed and demonstrated for the practice of the design of an intelligent database.

STUDENT LEARNING OUTCOMES:

(SLO527.1) Students will understand the current status of data mining methodology in industry and academics.
(SLO527.2) Students will learn teamwork techniques for large intelligent database projects through brain storming and joint requirement planning.
(SLO527.3) Students will learn and use effective tools for web navigation and program integration management.
(SLO527.4) Students will identify dirty data sources and construct data cleaning programs.
(SLO527.5) Students will learn algorithms and construct programs for capturing association rules.
(SLO527.6) Students will master statistical data mining techniques and write programs for trend analysis.
(SLO527.7) Students will implement code for generating decision rules using decision tree based classification.
(SLO527.8) Students will apply divide-and-conquer approaches to integrate small programs into a solution to a large program.

This syllabus is subject to change at any time and for any reason.
(SLO527.9) Students will learn to apply various data mining techniques into various areas of different domains.

(SLO527.10) Students will design a large scale software project with a focus on business intelligence.

(SLO527.11) Students will present the initial, intermediate, and final delivery of a system using CMM and rapid prototyping.

**METHOD OF EVALUATION (Tentative):**

Your grade in the course will be calculated as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Homework Assignments</td>
<td>25%</td>
</tr>
<tr>
<td>Three Exams</td>
<td>50%</td>
</tr>
<tr>
<td>Final Project</td>
<td>25%</td>
</tr>
</tbody>
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Assignments and projects will be posted in the university’s e-College communication system. Assignments must be turned in online in the appropriate drop box. There are three exams; however, I will drop your lowest exam and only base your average on your top two exams. This means that if you have to miss an exam for any reason, then that will be the exam that gets dropped. No make-up exams will be administered. The only exception to the lowest exam dropped policy is cheating: Any individual caught cheating on an exam will receive a zero on that exam and will not have that exam dropped.

The project is to be completed in small groups of no more than 4 students each. A limited number of singleton groups (individual projects) will be accepted on a case-by-case basis. The project will involve the collection, preparation, and analysis of interesting data from an outside source. More details will be provided towards the middle of the semester.

Your final letter grade will be determined as follows:

- A - total number of points $\geq 89.5$
- B - $79.5 \leq$ total number of points $< 89.5$
- C - $69.5 \leq$ total number of points $< 79.5$
- D - $59.5 \leq$ total number of points $< 69.5$
- F - total number of points $< 59.5$

I reserve the right to curve the grades in the course; however, for a given raw average, you will at least earn the grade letter shown above (if not better). As you will notice, I have already incorporated a standard rounding scheme into the schedule of grades. Thus, please do not ask me to round your grade at the end of the semester.

At the end of every semester, there is always at least one student who asks to have his/her final grade changed due to some external heart-breaking circumstance (e.g. I need an “A” because a “B” will keep my core GPA below 3.0 and I can't graduate.) Don’t try this on me! It is a waste of my time and your time. The only time I ever change a grade at the end of the semester is if there is an error on my part in grading.

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ACADEMIC ETHICS:

"All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).

ATTENDANCE POLICY:

Students are expected to be present at all class lectures. If a student is absent from class on the due date of any assignment, they are expected to make alternative arrangements to assure that the assignment is turned in ON TIME. Any student wishing to withdraw from the course must do so officially as outlined in the class schedule. THE INSTRUCTOR CANNOT DROP OR WITHDRAW ANY STUDENT.

COURSE REQUIREMENT DEADLINES:

Credit will be given for ONLY those exam(s), program(s), and/or project(s) turned in no later than the deadline(s) as announced by the instructor of this class unless prior arrangements have been made with the instructor.

ACADEMIC ETHICS AND HONESTY STATEMENT:

Scholastic dishonesty is a violation of the Code of Student Conduct. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct).

Academic dishonesty includes, but is not limited to, cheating on tests, plagiarism and collusion. Cheating includes copying from another student's test or homework assignments or projects or quizzes, using materials not authorized, collaborating with or seeking aid from another student during a test, knowingly using, buying, selling, stealing, or soliciting the contents of an unadministered test, and substituting for another person to take a test. Plagiarism is the appropriating, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own written work. Collusion is the unauthorized collaboration with another person in preparing written work for the fulfillment of course requirements. Academic dishonesty is a serious offense in college. You will be given not only a failing grade on the assignment or test, but also a failing grade for the class. Further, it will result in suspension from college.

PLAGIARISM:

In any written paper or test or assignment or quiz or project including code and/or documentation, you are guilty of the academic offense known as plagiarism if you half-copy or copy another author's sentences, words or any part of the content. This will result in an automatic grade of "F" for the course. Hence any of these must be fully avoided in order not to fail the class. Students copying from work done in previous semesters by former students as well as copying from internet sources without proper referencing will result in you failing this course. You cannot mix the author's words with your own or "plug" your synonyms into the author's sentence structure. To prevent

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unintentional borrowing, resist the temptation to look at the source as you write. The author's words, phrases, sentences must be put in your words and in your way of writing! When you do this, you are demonstrating your ability to understand and comprehend the material!

STUDENTS WITH DISABILITIES:

Students requesting accommodations for disabilities must go through the Academic Support Committee. For more information, please contact the Director of Disability Resources & Services, Halladay Student Services Bldg., Room 303D, (903) 886-5835.