CSCI 527.01W – Advanced Databases

COURSE SYLLABUS: SPRING 2020

INSTRUCTOR INFORMATION

Instructor: Kaoning Hu, Assistant Professor
Office Location: JOUR 220
Office Hours: TBA
Office Phone: 903-886-5406
Office Fax: N/A
University Email Address: kaoning.hu@tamuc.edu
Preferred Form of Communication: *Email*
Communication Response Time: *Usually 1 business day, may take up to 2*
                          (Please send a second email if no response after 2 business days)

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required:

"*Practical Applications of Data Mining: Methods and Practices*". Sang C. Suh. Jones and Bartlett Publishers, ISBN-13: 9780763785871, 2011.
OR
"*Introduction to Data Mining*". Pang-Ning Tan, Michael Steinbach and Vipin Kumar. 1st Edition, Addison-Wesley. ISBN-13: 978-0321321367, 2006 (or 2nd edition, ISBN-13: 978-0133128901, 2018).

Course Description

General theory, concept, and techniques related to intelligent database design are discussed in this course. The course presents comprehensive introduction to data mining techniques and provides the students with necessary background for the application of data mining to real problems. Topics include data processing, visualization, classification, predictive modeling, association analysis, clustering, and anomaly detection.

The *syllabus/schedule are subject to change.*

Student Learning Outcomes

1. Gain a working knowledge of data mining techniques.
2. Learn to design and implement algorithms to apply techniques in a practical fashion
3. Understand which algorithms to apply to which kind of databases to obtain desired useful knowledge about the data

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Course Prerequisites: CSCI 526 Database Systems, minimum B grade

Instructional Methods

D2L will be the method of presentation for the entire course. Please go to myLeo, and find D2L in Apps. All course materials will be found in D2L.

Student Responsibilities or Tips for Success in the Course

1. Check the course website early every week.
2. Read the slides and other supplementary material carefully.
3. Start your project early.
4. Do not hesitate to ask questions to the instructor and the teaching assistant.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Assessments

The weight total grade is computed as
     Quizzes: 20%
     Assignments: 20%
     Exam 1: 20%
     Exam 2: 20%
     Project: 20%

Except the term project, all assignments, quizzes, and exams are individual assignments, quizzes, and exams, and thus must be completely the original work of the student submitting them.

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Unless special instructions are provided, assignments are NOT to be posted on any discussion board. Your completed work must be placed in the appropriate submission folder of D2L. DO NOT EMAIL ME ANY ASSIGNMENTS. Please follow the rules for naming and posting assignments, as outlined in the Grading Rubric document.

All assignments must be completed on time. Late submission is subject to penalty: 10% if late but no later than 24 hours; 20% if later than 24 hours but no later than 7 calendar days; No grade if later than 7 calendar days.

Bonus credit – in some assignments, the students may be awarded bonus credits. Bonus credits will not be counted towards the weight total grade. However, bonus credits will be considered when the student's weight total grade is very close to the borderline between two letter grades.

TECHNOLOGY REQUIREMENTS

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A

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Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
  - o 512 MB of RAM, 1 GB or more preferred
  - o Broadband connection required courses are heavily video intensive
  - o Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:

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- o Sound card, which is usually integrated into your desktop or laptop computer
- o Speakers or headphones.
- o *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.
        Pop-ups are allowed.
        JavaScript is enabled.
        Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - o Adobe Reader https://get.adobe.com/reader/
  - o Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - o Adobe Shockwave Player https://get.adobe.com/shockwave/
  - o Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at

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a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT
Brightspace Support
Need Help?
Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:
https://community.brightspace.com/support/s/contactsupport

System Maintenance

D2L runs monthly updates during the last week of the month, usually on Wednesday. The system should remain up during this time unless otherwise specified in an announcement. You may experience minimal impacts to performance and/or look and feel of the environment.

Interaction with Instructor Statement

To communicate with me about this course you are to use the email address on this syllabus. Please include the course number in the beginning of the subject field for every email message. During the week, you can generally expect a response to your emails within 1 business day. If you do not receive my response in 2 business days, please send a second email to me.

You can also call me at my office or stop by my office during office hours. You can also schedule an appointment by email.

My office location, phone number, and office hours are subject to change and amendment.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

If you miss an assignment or exam in case of an emergency situation (medical, family, etc.), you will be given extra time.

If you miss the final project or the final exam in case of an emergency, you will receive an "X" (incomplete) grade. You will be given extra time to finish the project. After you finish

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the project, your grade will be updated. For more information about "X" grade, please refer to this webpage:
http://www.tamuc.edu/admissions/registrar/generalInformation/grade.aspx

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette
http://www.albion.com/netiquette/corerules.html

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

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ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu

Website: Office of Student Disability Resources and Services

http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

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Web url:

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

COURSE OUTLINE / CALENDAR
(01/13/2020 through 05/08/2020)

Week 1	Introduction, association rules
Week 2	Classification Rules
Week 3	Classification Rules – Decision Tree
Week 4	Classification – Overfitting and Decision Tree Pruning
Week 5	Introduction to Artificial Neural Networks
Week 6	Fuzzy Logic
Week 7	Classification – Other methods (term project released)
Week 8	Exam 1
Week 9	Clustering – K-Means and Hierarchical
Week 10	Clustering – Density-based
Week 11	Bayesian Theorem
Week 12	Statistical Data Mining
Week 13	Preprocessing
Week 14	Exam 2
Week 15	Term project due

Course calendar will adapt to the actual progress of the classes and may not be accurately the same as the table above.

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