Introduction to Data Mining COSC-6337.001
Department of Computing Sciences
Summer I 2019

A. COURSE INFORMATION

Course number/section: COSC-6337.001
Class meeting time: MTWR 10:00-11:55 AM
Class location: EN-107
Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Dr. Longzhuang Li
Office location: CI-323
Office hours: MW 1:00-3:00PM
T 10:00-11:00AM
Telephone: 825-2406
e-mail: Longzhuang.Li@tamucc.edu
Appointments: Call me or send me an email

C. COURSE DESCRIPTION

This course will introduce fundamental strategies and methodologies for data mining along with the concepts underlying them, and will provide hands-on experience with a variety of different techniques ranging from statistics to machine learning to database, with a focus on analysis of large data sets. Students will learn to use the Weka workbench, a set of data mining tools.

Catalog Description 3 semester hours
An introduction to fundamental strategies and methodologies for data mining. Topics include data preprocessing, mining frequent data patterns, classification, clustering, and outlier detection. Summer

D. PREREQUISITES AND COREQUISITES

Prerequisites
COSC 5335 and COSC 5321

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Optional Textbook(s) or Other References

Supplies
None

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

- Understand the basic statistical description of data, and be able to measure data similarity and dissimilarity.
- Be able to handle missing and noisy data.
- Understand the frequent itemset mining methods.
- Be able to analyze data using different classification methods, including decision tree, Bayes classification methods, rule-based classification.
- Understand and use a variety of cluster analysis methods.
- Understand outlier detection methods.

By the end of this course, students should be able to:
1. Comprehend the essential principles of contemporary data mining techniques;
2. Be familiar with data preprocessing and cleaning techniques associated with data mining;
3. Be able to apply data mining techniques to analyze large real world data sets.

G. INSTRUCTIONAL METHODS AND ACTIVITIES
The class includes lectures, presentations, term papers, and term projects. Students are expected to actively participate in the discussion.

H. MAJOR COURSE REQUIREMENTS AND GRADING
Grade Scale: A (90-100%)  B (80-89%)  C (70-79%)  D (60-69%)  F (<60%)

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<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Chapter 1</td>
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<td>1</td>
<td>Getting to Know Your Data</td>
<td>Chapter 2</td>
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<td>1</td>
<td>Data Preprocessing</td>
<td>Chapter 3</td>
<td>Assignment 1</td>
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<td>2</td>
<td>Mining Frequent Patterns, Associations and Correlations</td>
<td>Chapter 6</td>
<td>Research Paper</td>
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<tr>
<td>2</td>
<td>Exam 1</td>
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<td>3</td>
<td>Classification: Basic Concepts</td>
<td>Chapter 8</td>
<td>Team Project 1</td>
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<td>4</td>
<td>Cluster Analysis: Basic Concepts</td>
<td>Chapter 10</td>
<td>Team Project 2</td>
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<td>5</td>
<td>Outlier Detection</td>
<td>Chapter 12</td>
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<td>5</td>
<td>Classification: Advanced Methods</td>
<td>Chapter 9</td>
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<td>5</td>
<td>Term Paper Presentation</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
The students are expected to come to class on time every day the class meets. Read the chapter to be discussed before coming to class. Ask questions of material you do not understand. If I cannot explain the answers to your satisfaction, make an appointment with me to discuss the question. Demonstrate integrity, maturity, and ethical behavior.

Late Work and Make-up Exams
Assignments are accepted until MIDNIGHT on the due date. Every homework assignment will list a due date for full credit. Late assignments will lose 10% of the maximum score per day. Makeup exams will not be given under normal circumstances. If you notify me immediately that serious, unavoidable,
documentable (e.g., with a letter from your doctor) circumstances have arisen, I will discuss options for replacing the missing grade. (For example, I may allow the grade earned on the comprehensive final to replace the grade for the missed exam.) Excused absences due to school sponsored activities, religious observations, family rituals, etc. should be discussed in advance.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar
• Grade Appeals (College of Science and Engineering)
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a
  student who believes that he or she has not been held to appropriate academic standards
  as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading,
  may appeal the final grade given in the course. The burden of proof is upon the student to
  demonstrate the appropriateness of the appeal. A student with a complaint about a grade
  is encouraged to first discuss the matter with the instructor. For complete details,
  including the responsibilities of the parties involved in the process and the number of
days allowed for completing the steps in the process, see University Procedure
  13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible
  through the University Rules website at
  http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science
  and Engineering Grade Appeals webpage at
  http://sei.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the
  grade appeal process, students may contact the chair or director of the appropriate
department or school, the Office of the College of Science and Engineering Dean, or the
  Office of the Provost.

• Disability Services
  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
  believe you have a disability requiring an accommodation, please call (361) 825-5816 or
  visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access
issues in the classroom or on campus, please contact the Disability Services office
for assistance at (361) 825-5816.

http://disabilityservices.tamucc.edu/

• Statement of Academic Continuity
  In the event of an unforeseen adverse event, such as a major hurricane and classes
could not be held on the campus of Texas A&M University–Corpus Christi;
  this course would continue through the use of Blackboard and/or email. In addition,
  the syllabus and class activities may be modified to allow continuation of the course.
  Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be
  operational within two days of the closing of the physical campus. However,
  students need to make certain that the course instructor has a primary and a
  secondary means of contacting each student.
L. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.