Purpose of Course
The purpose of this course is to provide a core knowledge of the concepts of data mining. This knowledge will enable the students to apply the data analytics process, theory, and algorithms to various large datasets. Students will acquire a knowledge of applied machine learning, theory, and algorithms used for mining data and understand how to gain insight information through data mining process.

Text and Materials
No textbook required.
Check Brightspace Course Page for supplementary reading resources.
You may read the book: Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Aurelion Geron, or also watch the Andrew Ng Machine Learning youtube videos.

Grading Scheme

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 90</td>
<td>A</td>
</tr>
<tr>
<td>&gt;=80</td>
<td>B</td>
</tr>
<tr>
<td>&gt;= 70</td>
<td>C</td>
</tr>
<tr>
<td>&gt;= 60</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60</td>
<td>F</td>
</tr>
</tbody>
</table>

Curving is at the discretion of the professor.

Late Policy

Brightspace is where all the Homework assignments, and Programming Assignments (Lab) will be submitted. You may also be asked to submit your assignments through Github. Late Homework Assignments and Lab will be accepted but with penalty. The late submission made within two days will receive 15% penalty, followed by additional 10% penalty for each day up to two days. After that, assignments (HW and labs) will not be accepted.
Even if your work is incomplete, please submit your assignment so you can receive partial credit for the work you did complete.
Extensions (with no penalty) are only provided to students with DSP accommodations, or in the case of exceptional circumstances.
Submission times are rounded up to the next day. That is, 2 minutes late = 1 day late.
### Tentative Class Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Assignment Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Syllabus, Intro to Machine Learning</td>
<td>Lab 00 (not graded)</td>
</tr>
<tr>
<td>Week 2</td>
<td>Multivariate Linear Regression</td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td>Logistic Regression</td>
<td>HW01 (due 9/28 by 11:59 pm)</td>
</tr>
<tr>
<td>Week 4</td>
<td>Decision Trees</td>
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</tr>
<tr>
<td>Week 5</td>
<td>Support Vector Machines</td>
<td>HW02 (due 10/12 by 11:59 pm)</td>
</tr>
<tr>
<td>Week 6</td>
<td>Neural Networks</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>Neural Networks</td>
<td>HW03 (due 11/2 by 11:59 pm)</td>
</tr>
<tr>
<td>Week 8</td>
<td>Model Evaluation</td>
<td>Exam 01 (10/19 in-class)</td>
</tr>
<tr>
<td>Week 9</td>
<td>Feature Engineering</td>
<td></td>
</tr>
<tr>
<td>Week 10</td>
<td>Bagging and Boosting</td>
<td></td>
</tr>
<tr>
<td>Week 11</td>
<td>Unsupervised Learning: Clustering</td>
<td></td>
</tr>
<tr>
<td>Week 12</td>
<td>Unsupervised Learning: PCA</td>
<td>HW04 (due 11/30 by 11:59 pm)</td>
</tr>
<tr>
<td>Week 13</td>
<td>Thanksgiving Break</td>
<td></td>
</tr>
<tr>
<td>Week 14</td>
<td>Deep Learning</td>
<td>Exam 2 (11/30 in-class)</td>
</tr>
<tr>
<td>Week 15</td>
<td>Deep Learning and Reinforcement Learning</td>
<td></td>
</tr>
<tr>
<td>Week 16</td>
<td>Final Exam Project</td>
<td>Dec 12 (10.30 - 12.30 pm) @ STEM 405</td>
</tr>
</tbody>
</table>

All dates are tentative except final exam.
**Course Description**

Advanced study of data analytics including data mining techniques, applied machine learning, theory and algorithms for analyzing data for decision making.

**Program Learning Outcomes**

Program learning outcomes define the knowledge, skills, and abilities students are expected to demonstrate upon completion of an academic program. These learning outcomes are regularly assessed to determine student learning and to evaluate overall program effectiveness. Students majoring in the Department of Computer Science may access program learning outcomes at http://www.sfasu.edu/academics/colleges/sciences-math/computer-science/about/accreditations

**Student Learning Outcomes**

In general, SLOs in a course are specific and include the exact knowledge, skill or behavior taught in the course in support of the more global PLOs. For additional information on meaningful and measurable learning outcomes, see: https://www.sfasu.edu/academics/colleges/sciences-math/computer-science/about/accreditations

**Course Requirements**

Students are expected to attend classes and ensure they have understood the material being taught. Students are encouraged to ask questions and get their difficulties resolved while in class. There will be regular homework assignments(04), quizzes and examinations(02) and final exam project to test the student understanding of the material. The grade percentage to these components are specified in the Grading Scheme above.

**Exam Note**

There are no exemptions from the final examination and no changes in taking the final examination. Check the final exam time. If the final exam time is a problem, you need to drop this course.

Unless your absence is approved (as per the attendance policy), there will be no replacement exam 1 and 2.

**Course Calendar**

This course meets for a minimum of 37.5 lecture contact hours during the semester. Students have significant weekly reading assignments. Students are required to complete a major project and make at least one class presentation, weekly homework/programming assignments, and 2-3 periodic exams in addition to the final exam. Students are expected to prepare for any class assignments or quizzes over the material covered in class or in the reading material. Successful completion of these activities requires at a minimum six additional hours of outside of classroom work each week.

Disclaimer: Per SFA policy 5.4, this schedule and chosen exercises reflects that for each credit hour we will have one hour of faculty instruction with at least two hours of out-of-class student work per week. In other words, for an X credit hour class the student should expect X class hours of faculty instruction with 2 time X out-of-class hours of student work per week.

**Asynchronous Minutes**

The students are required to devote 150 minutes outside the instructional hours, where you will be asked to conduct independent study based on online resources (not covered in class) related to the course, and the material will be asked in the HW assignments(s), labs or exams.

**Attendance Policy**

Attendance and constructive class participation is expected. There is no specific grade for attendance. But students who actively participate in the class except for one unexcused absence will qualify for 5% bonus grade. Student’s absence excused by the Dean of Students Office will only be accepted by the faculty.
The Dean of Students Office will help to notify faculty of a student’s absence for certain parameters. You can go [HERE](#) to learn more about this new process and also submit the form. It is still at the faculty member’s discretion on any missed assignments, tests, etc.

**Educational Objectives**

Upon successful completion of the course, students should be able to:

1. Demonstrate a core knowledge of the fundamental concepts of data mining techniques;
2. Evaluate the applications of various theory and methods mining datasets;
3. Describe the main issues of the data mining process;
4. Identify current trends in the field of data mining;

**Course Content**

The following topics is listed below:

- Introduction to data mining and machine learning (4)
- Data mining techniques (12)
- Programming for problem solving (6)
- Selected theory, techniques, and algorithms for data mining (20)
- Exams (plus final) (3)

A more detailed listing of the topics is available at [https://www.sfasu.edu/docs/computer-science/undergraduate-course-CSCI4362.pdf](https://www.sfasu.edu/docs/computer-science/undergraduate-course-CSCI4362.pdf)

**Withheld Grades Semester Grades Policy (A-54)**

Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. For additional information, go to [https://www.sfasu.edu/docs/policies/5.5.pdf](https://www.sfasu.edu/docs/policies/5.5.pdf)

**Attendance**

Seating assignments may be made, and roll will be taken regularly. If you come to class, you are expected to be present and awake the entire class period unless you have been given permission to leave early. If you are absent from class, please make sure to get notes from a classmate. Cell phones and other electronic communication devices must be turned off during class. Possession of a cell phone or other electronic communication device during an exam will result in an examination grade of zero. Please do not walk across the front of the room after the class has started. Students entering the classroom after the lecture has started should take a seat in the back of the room.
Examination Policy

All class examinations are considered to be a major part of the course work upon which a large part of the course grade depends. There are NO make-up exams! Class examinations will be announced at least two classes prior to the examination. If you have a conflict with another university event, you must contact me well in advance of the examination. In case of an extreme emergency, contact me before the scheduled examination. Failure to do so may result in an examination grade of zero. There are no exemptions for the final examination and no changes in taking the final examination. All students must take the final exam. A zero on the final exam will result in an F in the course. Check the final examination time. If the final examination time is a problem, you need to drop this course. Once the first person has left the room on the day of an examination, no one else will be permitted to begin the exam.

Assignment Policy

All assignments are due at the announced time on the specified due date. Assignments may not be accepted late (see Assignment Late policy). If you have a conflict, please contact me in advance. You should turn in your homework and lab assignments done neatly, clearly, and to the best of your ability. Follow all the instructions given. You will lose points for failure to follow instructions. DO NOT slide any work under my office door or under the door to the Computer Science offices, or in my office mail box. Follow the instructions on the assignments on how to turn in your assignments. PLEASE NOTE: You may be given assignments during the last five class days of the semester. You may be asked to do your assignments in groups.

If any HW or lab assignments are not posted, then the previous graded HW or lab assignments will be considered and the grades will be distributed evenly.

Software Policy

Disciplinary action will be taken against individuals who perform unauthorized duplication of software or who are involved in the unauthorized use of duplicated software. Such action may make it impossible for you to successfully complete this course.

Computer Laboratory Usage

Students utilizing equipment in university computing laboratories are expected to read and abide by all posted policies for the laboratories. Please note that no children and no pets are permitted in university computing laboratories.

Drop Policy (Univ.)

The official university add/drop policy is located at: http://www.sfasu.edu/policies/add_drop.asp. If you have questions concerning registration, add/drop or the withdraw process, contact the Registrar at (936) 468-2501 or E-mail: REGISTRAR@SFASU.EDU. The Registrar is located on the 2nd floor of the Rusk building.

Acceptable Student Behavior

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic, or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the iCare: Early Alert Program at SFA. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed. Information regarding the iCare program is found at https://www.sfasu.edu/judicial/earlyalert.asp or call the office at 936-468-2703.

Computer Account Policy

All assignments that require the use of the University Computer must be done under the computer account that is assigned to you in this class. You should NOT do other class assignments in this account, and you should NOT do assignments from this class in other accounts. Failure to abide by the above statements will mean that you will received a grade of F in this course.
**Special with Disabilities**

To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/

Students with special accommodation requests have the responsibility to immediately initiate a meeting with the instructor to discuss how the special accommodations will be provided. Students who are aware of these special needs at the beginning of the semester must inform the instructor in person before the twelfth class day about any class activity, which will require special accommodations.

**Student Wellness and Well-Being**

SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc. If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
The Dean of Students Office (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFASU Human Services Counseling Clinic
www.sfasu.edu/humanservices/139.asp
Human Services Room 202
936-468-1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

Crisis Resources:
Burke 24-hour crisis line 1(800) 392-8343
Suicide Prevention Lifeline 1(800) 273-TALK (8255)
Crisis Text Line: Text HELLO to 741-741

**Academic Integrity**

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff and students to adhere to and uphold this policy.
Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

If in the instructor’s judgment an instance of academic dishonesty on an examination has occurred, a grade of zero will be assigned as the examination grade and a minimum of one (1) letter grade will be lost in the course grade. Possession of a cell phone or other electronic communication device (without the approval of the instructor) during an exam will result in an examination grade of zero. A course grade of F may be assigned depending on the situation. A student found cheating on an examination may not drop the course. If a student is judged to be cheating on any part of a homework/programming/project assignment or quiz, the student will receive negative points equal to the value of the entire homework/programming/project/quiz. A negative grade will not be replaced by any possible bonus assignment. Both person who did the work (homework, quiz, test) and the person copying the work will be considered as cheating. A recurrence of this by any individual will result in a grade of F in the course. DO YOUR OWN WORK!!!!! Do NOT show your code to other students!!!

Academic dishonesty using AI

Academic integrity is a core value of this course, and any form of academic dishonesty, including using artificial intelligence (AI) to cheat, will not be tolerated. Cheating with AI includes, but is not limited to, using AI-generated content for assignments or exams, using AI chatbots to communicate with others during exams, or using AI tools to generate responses to exam questions. Any student caught engaging in academic dishonesty using AI will face serious consequences, including but not limited to, failing the course and being reported to the appropriate academic authorities. It is important to remember that AI is a tool to assist in learning and not to replace it, and that academic dishonesty undermines the learning experience for everyone.