

College of Business

Spring 2023

MIS 181-01: Machine Learning Applications in Business

Course Schedule: Tuesday and Thursday, Tahoe Hall 1009, 3:00PM-4:15PM

Disclaimer: This syllabus and the schedule of readings, assignments, and activities may be changed by the instructor in order to maximize student learning needs and meet the objectives of the courses.

I. Instructor Information

| | |
|----------------------------|--|
| <i>Instructor</i> | Evren Eryilmaz |
| <i>Office</i> | TAH 2094 |
| <i>Office Hours</i> | Tuesdays and Thursdays 12:00-1:30 pm, and by appointment |
| <i>Office Phone</i> | 916-278-3889 |
| <i>E-mail</i> | evren.eryilmaz@csus.edu |

Email access is essential in communicating with the instructor and your peers. Please activate your CSUS e-mail account and log on to the SacCT course regularly.

This course is offered in a hybrid learning format.

II. ACADEMIC LEARNING RESOURCES

Optional Text:

Title: Machine Learning in Business: An Introduction to the World of Data Science 3rd Edition
Author: John C. Hull
Publisher: Independently published (May 26, 2021)
ISBN-13: 979-8510652635

Optional Text:

Title: Python Machine Learning for Beginners
Authors: AI Publishing
Publisher: AI Publishing LLC (October 23, 2020)
ISBN-10: 1118804678
ISBN-13: 978-1734790153

Online Resources:

Scikit-learn machine learning in python
<https://scikit-learn.org/stable/> (optional)

Tensorflow

<https://www.tensorflow.org/resources/libraries-extensions> (optional)

Software:

1. Python: <https://www.python.org/downloads/>
2. Jupyter Notebook: <https://jupyter.org/>

III. Business Concepts

Keywords: Discovering Knowledge from Business Data, Understanding Business Situations, Improving Business Decisions, Machine Learning as a Source of Competitive Advantage

IV. INSTRUCTIONAL DESIGN

Course Description: Applies modern machine learning applications in business to data analysis and problem solving. Topics are presented in the context of decision support and may include knowledge representation, neural networks, genetic algorithms, rule induction, fuzzy logic, case-based reasoning and intelligent agents.

Prerequisites: DS 101, MIS 150

Course Learning Goals and Objectives:

1. Develop managerial understanding of machine learning and its applications
2. Understand the different Machine Learning training techniques
3. Understand the difference between Supervised and Unsupervised training
4. Understand the difference between Classification and Regression
5. Synthesize and articulate ideas clearly and convincingly in oral and written forms

V. CBA Program-Level Learning GOALS

Goal 1 Fundamental Business Knowledge

Competence based on fundamental business knowledge.

- 1.1 Demonstrate understanding of fundamental business theories, concepts, and skills.
- 1.2 Ability to analyze business information in performing business related tasks.

Goal 2 Integrative Business Competence

Business competence integrated with other business knowledge areas and ethical responsibility.

2.1 Ability to identify factors contributing to a managerial problem from a variety of business perspectives.

2.2 Enumerate the costs and benefits that potential solutions will have on the interdependent stakeholders of a firm.

Goal 3 Effective Business Communication

Business communication utilizing contemporary and classic communication techniques and methods.

3.1 Convey information in a variety of business settings.

3.2 Evaluate the efficacy of business communications.

Goal 4 Applied Business Capability

Ability to translate knowledge of business and management into practice.

4.1 Create effective business solutions that are both ethically sound and socially responsible.

4.2 Generate innovative and effective solutions for problem solving and decision making.

VI. Program and Course Level Assessment of learning

| Program Learning Goals | Student Learning Outcomes | Assessment Strategy | Direct Assessment Measure |
|-------------------------------|---|------------------------------------|----------------------------------|
| 1,2,3 | Fundamental business knowledge, integrative business competence, effective business communication | Homeworks, quizzes, and final exam | Scoring guide |
| 4 | Applied business capability | Project | Systems development project |

VII. Grading Criteria, Guidelines, and Assignments

Course Grading: I will give a homework at the end of each chapter in the textbook, two midterms, and a final exam. Examination material will be drawn from the textbook reading, in-class hands-on activities, any other assigned readings, and class lectures and discussion. Emphasis will be placed on the conceptual understanding of the material and NOT on memory alone. Understanding the application of the concepts will greatly enhance your grade.

No make-up examination will be given without the prior approval of the instructor. If you fail to take the exam, without valid documentation, I will prepare a different exam which you will take at 75% of its grade value.

Final grades will be assigned according to the total points you have obtained through exams and group homework assignments relative to the total possible number of points.

| Item | Percentage |
|-------------------|-------------------|
| Homeworks | 40% |
| Midterms | 40% |
| Final Exam | 20% |
| Total | 100% |

Check the announcements on canvas, in class, and the professor's emails regarding important due dates. You will have one week time frame to work on a homework.

Your grade is also affected by the number of unexcused absences. You are allowed to have 3 unexcused absences. For each absence after your allowance, 10 points will be deducted. Note that absences are only excused for a valid reason (health problems, jury duty etc.) and **MUST** be accompanied with documentation (i.e., health center note with a phone number to call for questions) provided within a week of returning to class.

Based on the total points, your grades will be assigned as follows:

| Percentage | Grade |
|--------------------|--------------|
| 94% to 100% | A |
| 91% to 93% | A- |
| 89% to 90% | B+ |
| 84% to 88% | B |
| 81% to 83% | B- |
| 79% to 80% | C+ |
| 74% to 78% | C |
| 70% to 73% | C- |
| 60% to 69% | D |
| 0% to 59% | F |

The instructor reserves the right to modify the course grading scheme. Final grade can be changed only if a posting error has occurred per University policy.

VIII. WEEKLY OUTLINE: *The schedule of readings, assignments, and activities may be changed by the instructor in order to maximize student learning needs and meet the objectives of the course. Check the announcements on canvas, in class, and the professor's emails regarding important due dates.*

TENTATIVE SCHEDULE (Subject to Change)

| Date | Topic |
|--------------|-----------------------------|
| Week 1 | Introductions and Chapter 1 |
| Week 2 | Chapter 1 |
| Week 3 | Chapter 2 |
| Week 4 | Chapter 2 |
| Week 5 | Chapter 3 |
| Week 6 | Chapter 3 |
| Week 7 | Chapter 4 |
| Week 8 | Chapter 4 |
| Spring Break | |
| Week 9 | Chapter 5 |
| Week 10 | Chapter 5 |
| Week 11 | Chapter 6 |
| Week 12 | Chapter 6 |
| Week 13 | Chapter 7 |
| Week 14 | Chapter 8 |
| Week 15 | Chapter 8 |

IX. COURSE TIME COMMITMENT

| Contact Hours and Assignments | | Contact Hours |
|--|----------------------|---------------------------------|
| Face-to-face Lectures & Online Meetings | | 45 hours (3 unit course) |
| Out of Class | Homework Assignments | |
| | Reading Assignments | |

| | | |
|----------------------|------------------------------|--------------------|
| | Group Project & Presentation | 6-9 hours per week |
| | Exams | |
| Total Hours per Week | 9-12 hours /week | |

X. SACRAMENTO STATE ACADEMIC HONESTY POLICY AND REGULATIONS excerpt “Definitions of Academic Dishonesty” <http://www.csus.edu/umannual/student/STU-0100.htm>

Attendance policy. Class attendance is critical for learning the material in this course. I expect you to attend all classes, and absences are excused only per university policy:

<https://www.csus.edu/acse/senate-info/14-15agendas-minutes/020515agendas-minutes/14-15fs-111.pdf>

Cheating. At Sacramento State, cheating is the act of obtaining or attempting to obtain credit for academic work through the use of any dishonest, deceptive, or fraudulent means. Cheating at Sacramento State includes but is not limited to:

- Copying, in part or in whole, from another’s test or other evaluation instrument.
- Using crib notes, "cheat sheets," or any other device, including electronic devices not permitted by the instructor as an aid in writing an examination.
- Submitting work previously graded in another course unless doing so has been approved by the course instructor or by department policy.
- Submitting work simultaneously presented in more than one course, unless doing so has been approved by the respective course instructors or by the department policies of the respective departments.
- Altering or interfering with grading or grading instructions.
- Sitting for an examination by a surrogate, or as a surrogate.
- Any other act committed by a student in the course of his or her academic work that defrauds or misrepresents, including aiding or abetting in any of the actions defined above.

Plagiarism. Plagiarism, as a form of cheating, is the use of distinctive ideas or works belonging to another person without providing adequate acknowledgement of that person’s contribution. Regardless of the means of appropriation, incorporation of another’s work into one’s own requires adequate identification and acknowledgement. Plagiarism is doubly unethical because it deprives the author of rightful credit and gives credit to someone who has not earned it.

Acknowledgement is not necessary when the material used is common knowledge. Plagiarism at Sacramento State includes but is not limited to:

- The act of incorporating into one's own work the ideas, words, sentences, paragraphs, or parts thereof, or the specific substance of another's work without giving appropriate credit thereby representing the product as entirely one's own. Examples include not only word-for-word copying, but also the "mosaic" (i.e., interspersing a few of one's own words while, in essence, copying another's work), the paraphrase (i.e., rewriting another's work while still using the other's fundamental idea or theory); fabrication (i.e., inventing or counterfeiting sources), ghost-writing (i.e., submitting another's work as one's own) and failure to include quotation marks on material that is otherwise acknowledged; and
 - Representing as one's own another's artistic or scholarly works such as musical compositions, computer programs, photographs, paintings, drawing, sculptures, or similar works.

XI. ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Services to Students with Disabilities (SSWD) <https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities/> Sacramento State is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class, please immediately contact Services for Students with Disabilities (SSWD) to discuss eligibility. A current accommodation letter from SSWD is required before any modifications, above and beyond what is otherwise available for all other students in this class will be provided.

Student Health and Counseling Services <https://www.csus.edu/student-life/health-counseling/> Your physical and mental health are important to your success as a college student. Student Health and Counseling Services (SHCS) in The WELL offers medical, counseling, and wellness services to help you get and stay healthy during your time at Sac State. SHCS offers: Primary Care medical services, including sexual and reproductive healthcare, transgender care, and immunizations; urgent care for acute illness, injuries, and urgent counseling needs; pharmacy for prescriptions and over-the-counter products; mental health counseling, including individual sessions, group counseling, support groups, mindfulness training, and peer counseling; athletic training for sports injury rehabilitation; wellness services, including nutrition counseling, peerled health education and wellness workshops, and free safer sex supplies; violence and sexual assault support services. Most services are covered by the Health Services fee and available at no additional cost.

Crisis Assistance & Resource Education Support (CARES) <https://www.csus.edu/student-affairs/crisis-assistance-resource-education-support/> If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away. The CARES office provides case management support for any enrolled student.

XII. STUDENT RESOURCES

1. CBA Tutoring Center – TAH 3067. Contact the Office of Student Engagement (TAH 1040) for tutoring schedules.

2. University Reading and Writing Center (URWC) - provides encouraging, focused, and non-judgmental one-to-one tutorials in reading and writing for any undergraduate or graduate student at CSUS. <http://www.csus.edu/writingcenter/>
3. The Peer and Academic Resource Center (PARC) - major services include Supplemental Instruction; Supplemental Instruction Plus, Workshops & Individual Tutorials; and Peer Led Advising for college Experiences. <http://www.csus.edu/parc/>

XIII. OTHER INFORMATION

[Services to Students with Disability \(SSWD\)](#)

Sacramento State is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class, please immediately contact Services for Students with Disabilities (SSWD) to discuss eligibility. A current accommodation letter from SSWD is required before any modifications, above and beyond what is otherwise available for all other students in this class will be provided.

[Student Health and Counseling Services](#)

Your physical and mental health are important to your success as a college student. Student Health and Counseling Services (SHCS) in The WELL offers medical, counseling, and wellness services to help you get and stay healthy during your time at Sac State. SHCS offers: Primary Care medical services, including sexual and reproductive healthcare, transgender care, and immunizations; urgent care for acute illness, injuries, and urgent counseling needs; pharmacy for prescriptions and over-the-counter products; mental health counseling, including individual sessions, group counseling, support groups, mindfulness training, and peer counseling; athletic training for sports injury rehabilitation; wellness services, including nutrition counseling, peer-led health education and wellness workshops, and free safer sex supplies; violence and sexual assault support services. Most services are covered by the Health Services fee and available at no additional cost.

[Crisis Assistance & Resource Education Support \(CARES\)](#)

If you are experiencing challenges with food, housing, financial or other unique circumstances that are impacting your education, help is just a phone call or email away. The CARES office provides case management support for any enrolled student.

The [CSU Student Success Network](#) is excited to partner with the [USC Race & Equity Center](#) for its workshop series *Equity Now!* – an equity-focused professional development series for CSU staff, faculty, and administrators. During the four-week span of the project, *Equity Now!* practitioners will engage faculty and staff in action-planning to identify barriers and opportunities to create and sustain equity-minded change for their campuses. The series begins in early September and space is limited.

The [Student Investment Fund](#) started in Fall 2010 with a seed investment of \$250,000 and just passed \$1,000,000! Congratulations to all of the students, faculty, and staff who have been involved over the years, Professor David Moore, the faculty advisor, and UEI, which not only maintains and manages the funds but also got it started with the initial investment.

Links to campus resources

1. [Academic Advising](#)
2. [Information Resources and Technology](#)
3. [Support Centers and Programs](#)
4. [Reading & Writing Center](#)
5. [Student Rights and Responsibilities](#)

Late and Make-up Policy: The general policy for this course is to require completion of assignments as specified in the class schedule. All assignments are due at the beginning of the class period. If the assignment is submitted after the beginning of the class, there will be a 5% deduction. If the assignment is submitted on the same day, but after class, there will be a 10% penalty. If the assignment is submitted within a week, there will be a 20% penalty. No late assignments will be accepted after 1 week. All assignments should be printed and stapled together with the cover letter statement (click for sample) on the top. If you have an emergency or other extenuating circumstances that will affect your ability to turn in an assignment or complete an exam, please contact me as soon as possible to discuss.

Incomplete: An incomplete grade (I) will only be issued in accordance to College of Business Administration policy. Among the conditions imposed by the instructor that must be met are: (1) a current passing grade (70 percent or better), (2) the successful completion of all prior assignments and exams, and (3) an unforeseen and unusual event beyond your control which prevents you from completing the semester, and can be documented and verified (employment-related events do not qualify). (4) An incomplete will only be considered after it has been determined that a withdrawal (W) cannot be issued. If you do not meet (1) through (4), you do not qualify for an incomplete. As stipulated by the University, an incomplete cannot be assigned when it is necessary for the student to attend additional class meetings to complete the course requirements.

Unauthorized Withdrawal (WU) indicates that a student did not officially withdraw from the course but failed to complete it. Among the conditions imposed by the instructor that must be met are: (1) a passing grade (70 percent or better) at the time that the student stopped attending classes, (2) attendance stopped before the 11th week of the semester. If you do not meet (1) and (2), you do not qualify for an unauthorized withdrawal (WU) grade and as a result you will be assigned a failing (F) grade.

Laptop and cell phone regulation: No photographing, recording or text messaging is allowed without permission of the instructor.

A disruptive student is a student who engages in classroom behavior that interferes with the process of teaching and learning. If a student is disruptive to my class, I will follow the Procedures for dealing with incidents of disruptive behavior described in the DEALING WITH INCIDENTS OF DISRUPTIVE STUDENT BEHAVIOR IN THE CLASSROOM document <http://www.csus.edu/umannual/student/STU-0112.htm>.