ALGORITHMS FOR BUSINESS DECISIONS (MKTG 6600) FALL 2022

THURSDAY, 6:00PM – 10:00PM

LOCATION: SFEBB 3160

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Course Description and Goals

Although theoretical and mathematical concepts play an important role in this course, the dominant focus of material covered in class will be on its pragmatic implications for business practice and, in particular, the formulation and implementation of business strategy.

Along with gaining insights into business decision-making process, this course is designed to use algorithms to predict business outcomes. In this age of data, managers now have access to multitudes of business data. However, many times they lack the right algorithms to make predictions. Therefore, a major aim of this course is to learn the features of a business context and use algorithms to successfully develop strategies. The programming language R will be used.

We will use the following approach:

Understanding the business context → knowing the decisions faced in that context → the algorithm(s) that can facilitate decision-making → gathering an intuitive and technical understanding of the algorithm → developing the algorithm in RStudio (or Python where needed) → combining the business context and the algorithm in a mini-project.

Projects (mini and end-term) are included to understand business decision-making. The aim is to help students understand business problems and generate analytic solutions.

Pre-requisites - IS 6489 or Instructor consent, proficiency in R (since this is an advanced course, coding will not be taught in this class; if a student is not proficient in R, please reconsider enrolling).

Course Structure

The course will involve lectures, class discussions, projects, and exam. You will be expected to attend class ready, willing and able to discuss the material assigned for that class.

Make sure that you have the most recent version of RStudio installed to run the code
Troubleshooting the provided R code is the student's responsibility.

Since this is an in-person class, there is no provision for students to join class remotely via Zoom. If for some reason you miss a class, make sure to go over the class notes to understand that week's topic.

Canvas

All class information would be available on Canvas. It is the student's responsibility to check the course Canvas page regularly for reminders, due dates, and updates. Emails, reminders, assignment dues dates, and reminders will be sent through Canvas.

Class Notes

Class notes will be available on Canvas before each class. I have written the notes for each topic so that students can gain a deeper understanding of the business context and the analytic method. Students are expected to go over the notes before class in which the topic will be discussed. There is no textbook for this class. If needed, relevant methodological and business articles will also be made available on Canvas.

Some recorded lectures may sometimes be made available on canvas. The lectures could include discussion of class notes and some discussion of the assignments i.e.. the R code and mini-project questions.

Mini-project

Each class would include a mini-project.
   a. The mini-project will combine the business context discussed in that class with the analytic method (e.g., the mini-project in the 4th class brings together product strategies and A/B testing in the form of a case).
   b. Some of the mini-projects will be available as an online link (check details on Canvas under the link Mini-project).

Weekly Practice Questions

1. Each week's class will include 5 or 6 questions that will help students to test their learning from that week's topic. The main aim of these practice questions would be to prepare for the final exam.

2. A second aim is to help students prepare for their future job interviews. The questions could be multiple choice or short answer and can include working with the R code to generate answers/predictions.
3. The format would be complete/incomplete and the score will not count towards the final grade. Canvas will reflect whether the student has completed the practice questions or not.
4. Students are strongly encouraged to complete the practice questions since these questions will help them in the final exam and project (especially the mini-project question and working with code). Complete the practice question in the week the topic is taught and don't wait till the end to complete them.

Project

There will be one, <u>individual</u>, project in this course. The project will require students to be proficient in R, which is a pre-requisite for this course. Students are free to use the code provided in the course for the project. But they should have the ability to independently modify and improve the code. The project *cannot* be submitted as a group project. Draft submissions will not be accepted or checked prior to final submission. Details of the project, including submission deadlines, will be provided on Canvas, 3 weeks before the project due date.

Exam

There will be one Exam. The exam will likely be in-class and multiple-choice. The focus of the exam will be on assessing your understanding of the course topics including application of the topics covered in business contexts. Please check the syllabus for the exam dates. <u>For only extreme reasons, the exam can be rescheduled if I am informed of such reasons three weeks before the exam date.</u>

<u>Please note that all due dates are FINAL</u>. To maintain fair and consistent evaluation across all students, there will be no make-ups (for the exam or project). Submissions received after the due date and time will not be accepted and will receive zero points. For emergencies, proper university documentation and approval from the University's Office of Accommodations is required.

<u>Academic honesty</u>:

a. **<u>Turnitin and other digital checks</u>** will be used to check for academic honesty for all submissions.
b. **Please do not share your responses with other students.** Since all submissions in this course are individual, the responses should be the student's own and provided without assistance from others.
c. Peculiarities and similarities in submissions will be flagged and investigated.
d. Do not post or share any course material without the instructor's permission.
e. If you see screenshot of any of this course's assessment material online, report it immediately to the instructor.

Grades and Evaluation

End-term Project	50%
Exam	50%
Total	100%

Overall Grade: The final grade will be determined across all components of assessment, mini-projects, project, exam, and in-class participation and will be broadly based on the following guidelines.

- Grade > 95% = A
- 90% < Grade ≤ 95% = A-
- 85% < Grade ≤ 90% = B+
- 80% < Grade ≤ 85% = B
- 75% < Grade ≤ 80% = B-
- 70% < Grade ≤ 75% = C+
- < 70% = Dealt on a case-by-case basis

Class schedule

Please refer throughout the semester to class schedule for class notes and schedule of topics. The following is the general plan of study. However, please note that this is only a tentative time plan and that changes may be made to it. Such changes (if any) will be mentioned during class and a new time plan will be uploaded on Canvas.

	Date	Topic
1.	August 25	Demand Forecasting Method: Linear Regression Application: Demand forecasting
2.	September 1	Financial Analytics – Corporate failure Method: Penalized Regression Application: Predicting financial distress
3.	September 8	Segmenting Customers and Positioning your brand Method: Hierarchical clustering Application: Segmenting customers
4.	September 15	Evaluating alternatives Method: A/B testing, ANOVA Application: Causal experimentation
5.	September 22	Recruitment, Retention, and Customer Satisfaction

		Method: Neural Nets Application: Calculating Customer Value
6.	September 29	Social Media Analytics Method: Text Analysis Application: Predicting response based on customer reviews
7.	October 6	Business Ethics and AI Method: Word vectors Application: Online advertising and semantic similarity *(Project information available on Canvas)*
8.	October 13	Image Analysis Method: Convolution Neural Nets Application: Visual Listening in Digital Markets
9.	October 20	Exam
10.	October 27	Project Submission

Statement of Professional and Ethical Conduct

Because of the importance of professional and ethical behavior in business, and its emphasis in our program, professional or academic misconduct is not tolerated in the David Eccles School of Business. Students are expected to adhere to the standards of behavior outlined in the University of Utah Code of Student Rights and Responsibilities (Policy 6-400). Students engaging in behavioral misconduct could be subject to suspension or dismissal from the University. Students involved in any form of academic misconduct, including but not limited to cheating on tests, plagiarism and collusion may, at the instructor's discretion, receive a failing grade in the course, examination, or academic assignment. In addition to or instead of this sanction, the instructor may refer the case to the Student Behavior Committee for hearing. If the instructor chooses not to do so, the Associate Dean for Academic Affairs, after appropriate investigation, may do so along with a recommendation to dismiss the student from the Business School. If, after hearing the evidence, the Committee determines that the student in question is guilty of the misconduct charged, the Committee may impose sanctions in addition to those taken by the professor. If the academic dishonesty is not proven, the instructor must rescind any sanctions imposed and will be required to evaluate the student's performance with the assumption that there has been no misconduct. The School will treat the student likewise. If a student suspects another student of academic misconduct, he/she should refer the incident to the instructor, the appropriate department, the Associate Dean for Academic Affairs, or the Student Behavior Committee, administered by the Associate Dean of Students, 270 Union.

Americans with Disability Act

The University of Utah David Eccles School of Business seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services (http://disability.utah.edu) , 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

Addressing Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender (which Includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

Syllabus

This syllabus is intended to provide students guidance in what would be covered during the semester and will be followed as closely as possible. However, the professor reserves the right to modify, supplement and make changes as the course needs arise. Any changes made to the syllabus will be communicated to the students in class.

Rescheduling
Rescheduling of examinations, submissions, and presentations is not permitted except in cases of sudden illness or emergency where instructor would require documentation to substantiate your request to reschedule.

Student Responsibility
It is the student's responsibility to contact instructor and submit necessary forms. If you have any questions, concerns or problems with the course, please bring them to the instructor's notice immediately. It is also the student's responsibility to follow the university's Code of Student Rights and Responsibilities (http://regulations.utah.edu/academics/6-400.php).

Campus Safety
The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu.

Covid-19 Guidelines
University leadership has urged all faculty, students, and staff to model the vaccination, masking, testing and self-reporting behaviors we want to see in our campus community.
These include:
• Vaccination
• Masking remains required in Utah Health facilities. In non-University of Utah Health facilities, indoor masking recommendations are based on current conditions and health department recommendations
• If unvaccinated, weekly asymptomatic coronavirus testing (available on campus, consider testing before conferences, travel, etc.)
• Self-reporting positive COVID-19 test results