

UCLA ANDERSON SCHOOL OF MANAGEMENT EASTON TECHNOLOGY MANAGEMENT CENTER

MGMT 180 – Data Science & Artificial Intelligence Business Applications

Instructor: Timothy Park
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Office Hours: By appointment

Summer 2021
Tuesday & Thursday
2:30 PM – 5:30 PM

COURSE DESCRIPTION

“The world’s most valuable resource is no longer oil, but data” was the headline in a recent article from The Economist. In fact, 5 out of the 6 largest companies in the world by market capitalization, are data technology businesses (Microsoft, Apple, Amazon, Alphabet, Facebook). This course is designed to provide students (from both technical and non-technical backgrounds) with a practical foundation in data science to manage, analyze and synthesize data to derive actionable insights and help solve strategic business problems.

Students will receive an introduction to the statistical tool R, learn how to communicate with databases using SQL (Structured Query Language), and acquire the skills of data storytelling by utilizing Tableau - a powerful and fast growing data visualization tool in the Business Intelligence (BI) industry. Business leaders will also provide current examples of how Data Science and Artificial Intelligence (AI) are being applied to tackle their short-term and long-term business challenges.

COURSE LEARNING OUTCOMES

- Gain an understanding of:
 - 1) the importance of data, 2) data science, 3) Machine Learning & AI applications,
 - 4) how data science and AI can enhance one’s respective careers and skillsets,
 - 5) identifying the real problem to be solved, determining Key Performance Metrics (KPIs), and effective data storytelling.
- Learn practical data software skills in:
 - 1) R/RStudio, 2) SQL, 3) Tableau.
- Demonstrate the ability to:
 - 1) ingest, analyze, and synthesize data, 2) glean actionable insights from the data,
 - 3) explain findings clearly by both an oral presentation and written report.

SOFTWARE

- R, RStudio *[open source software for data science, research, and technical communication]*
- SQL *[standard programming language designed to facilitate retrieving information]*
- Tableau *[free 1-year license through Tableau for Students program]*

COURSE CALENDAR

** These dates and agenda are subject to change at the discretion of the instructor.*

Week	Day	Date	Agenda/Topic	Due on this Date
1	Tue	6/22	<ul style="list-style-type: none"> ○ Introductions ○ Syllabus Review ○ Classroom Norms/Etiquette ○ Intro to Data Science (using R), AI, Big Data and Machine Learning 	<ul style="list-style-type: none"> ○ Please have your syllabus printed or with you on a computer ○ Please be ready to give a brief self-introduction
	Thu	6/24	<ul style="list-style-type: none"> ○ Quiz #1 ○ Databases ○ Intro to SQL Query ○ Intro to writing an Executive Summary ○ Guest Speaker #1: <i>TBD</i> 	<ul style="list-style-type: none"> ○ Top 3 Data Analysis Project ideas
2	Tue	6/29	<ul style="list-style-type: none"> ○ SQL Programming - Basic 	<ul style="list-style-type: none"> ○ Summary Report for Guest Speaker #1
	Thu	7/1	<ul style="list-style-type: none"> ○ Quiz #2 ○ SQL Programming – Intermediate ○ Guest Speaker #2: <i>TBD</i> 	<ul style="list-style-type: none"> ○ Top 2 Data Analysis Project ideas, with sample data
3	Tue	7/6	<ul style="list-style-type: none"> ○ Intro to Data Analysis and Visualization ○ Intro to Tableau 	<ul style="list-style-type: none"> ○ Summary Report for Guest Speaker #2
	Thu	7/8	<ul style="list-style-type: none"> ○ Quiz #3 ○ Tableau – Basic ○ Guest Speaker #3: <i>TBD</i> 	<ul style="list-style-type: none"> ○ Data Project proposal, with business issue(s) and question(s)
4	Tue	7/13	<ul style="list-style-type: none"> ○ Tableau – Intermediate ○ <i>Receive approval for data projects</i> 	<ul style="list-style-type: none"> ○ Summary Report for Guest Speaker #3
	Thu	7/15	<ul style="list-style-type: none"> ○ Quiz #4 ○ Tree-Based Models, Machine Learning (ML) ○ Guest Speaker #4: <i>TBD</i> 	<ul style="list-style-type: none"> ○ Exploratory data analysis for Final Project
5	Tue	7/20	<ul style="list-style-type: none"> ○ Natural Language Processing (NLP) 	<ul style="list-style-type: none"> ○ Summary Report for Guest Speaker #4
	Thu	7/22	<ul style="list-style-type: none"> ○ Quiz #5 ○ Artificial Intelligence (AI) ○ Guest Speaker #5: <i>TBD</i> 	<ul style="list-style-type: none"> ○ Initial data modeling results for Final Project
6	Tue	7/27	<ul style="list-style-type: none"> ○ Data Project Student Presentations (Part 1)* ○ Data Project Student Evaluations (Part 1) 	<ul style="list-style-type: none"> ○ Summary Report for Guest Speaker #5
	Thu	7/29	<ul style="list-style-type: none"> ○ Data Project Student Presentations (Part 2) ○ Data Project Student Evaluations (Part 2) 	
	Fri	7/30		<ul style="list-style-type: none"> ○ <i>Final presentation decks and written reports by 11:59 PM (Pacific Time)</i>

** For the Data Project, half the class will be randomly selected to orally present on Tuesday 7/27. The others will present on Thursday 7/29.*

COURSE REQUIREMENTS & ASSIGNMENT BREAKDOWN

Attendance / Participation	200 points
Guest Speaker Summary Reports	200 points
Quizzes	250 points
Data Analysis Project	350 points
TOTAL	1,000 points

GRADING SCALE

A:	900 – 1,000 points
B:	800 – 899 points
C:	700 – 799 points
D:	600 – 699 points
F:	< 600 points

- Straight-scale grading
- The letter grades A, B, C and D have the suffix plus (+) or minus (-) included to distinguish higher and lower performances within each of these letter grades.

USE OF LAPTOPS & MOBILE DEVICES IN CLASS

Laptops and mobile devices can be used in class for class engagement and note-taking purposes only. No use of laptops or mobile devices for any other purposes (including texting, emailing, browsing the internet, etc.) as a sign of respect for your classmates and to ensure productive engagement in class discussion. Violations of this policy may result in specific cold calling.

HONOR CODE

UCLA Anderson's Honor Code will always apply.

<http://www.anderson.ucla.edu/Documents/areas/adm/web/AndersonHonorCode.pdf>

Plagiarism, failure to follow guidelines of assignments, failure to properly cite reference materials, and all other disrespectful behavior in class are all unacceptable.

ATTENDANCE & PARTICIPATION

Attendance during each session is critical as this is a learning-intensive course which covers a significant amount of information, skills and hands-on workshops. Students are expected to attend all sessions (for the entire duration) and class participation is highly weighted. Students are expected to arrive promptly at the designated hour and have their cameras on throughout class. One-half grade reduction will occur for any unexcused absence. Special circumstances will always be considered on an individual basis (e.g., death in the family or recruitment activity which cannot be rescheduled).

Absences and tardiness disrupt the class proceedings and seriously affect the group dynamics that are desirable for an effective learning environment. It is the responsibility of the absent student to determine what they have missed in class and complete any assignments. There will be no make-up quizzes or recordings of the lectures/guest speakers.

GUEST SPEAKER SUMMARY REPORTS

We will have the honor of learning from several guest speakers (e.g., from tech, education, engineering, entertainment, finance, etc.). They will share about their career journeys, data trends in their respective industries, and the impact data is making in their business decisions. Other potential topics include:

- Comparing how decisions used to be made vs. cultivating a data-driven culture
- Overcoming hurdles and “managing up” when data analysis does not support the business vision
- Data challenges and ethical implications of data science such as consumer privacy, lack of transparency, misuse of data, cyber security, AI reinforcing human biases/diversity, etc.
- Leveraging AI/ML to tackle social problems and the future of big data analytics

Students will be asked to prepare 2-3 questions for each guest speaker.

Reports should be no longer than 2 pages (prose or bullets) and reflections of the following questions:

- 1) What insights did data science/AI/ML provide to tackle business challenges and make decisions? How would the outcome be different without using data? Anything you would try to improve?
- 2) What data topics piqued your interest and why? What can you apply to your own business idea?
- 3) What is your key takeaway(s) and why?

QUIZZES

Weekly quizzes will be given to help embed the newly acquired information (including material presented by the guest speakers). The quizzes will be for 15 minutes and presented using multiple choice, true or false, matching, fill-in-the-blank, and/or free response questions. The quizzes will be administered at any time during the class session and can be cumulative (i.e., include everything that students have learned from Week 1).

DATA ANALYSIS PROJECT

In lieu of a midterm or comprehensive final exam, students will select a dataset of their own interest to analyze for their final project. A final one-page written project proposal should be emailed to the Instructor, for approval, no later than Thursday July 8, 2021.

- The project could assess a specific industry/product/service/company ripe for disruption or assess developments in technology, customer/enterprise trends, regulations, etc. to improve efficiency.
- A scenario analysis processing pros & cons of specific recommendations, along with AI/ML application(s) from this course, should also be shared.
- Create at least 5 interactive Tableau worksheets/dashboards, to help the respective businesses improve their bottom line and make strategic decisions.
- The student audience will act as potential VC/investors/partner, C-suite/Executive-level management and ask questions in assessing their classmates' presentations.

Students will orally present their work in class using a slide presentation (e.g., PowerPoint, Google Slides, Prezi and/or Tableau Story). Furthermore, a written report no longer than 5 pages single-spaced (plus up to 3 pages of exhibits) will be submitted.

- Please ensure to cite all references and show supporting analysis in the Appendix.
- The deadline for submitting the presentation deck and written report is Friday July 30, 2021 (11:59 PM Pacific Time).

ADDITIONAL COURSE TEXTS

Effective Data Storytelling: How to Drive Change with Data, Narrative and Visuals

Author: Brent Dykes

Publisher: Wiley (December 17, 2019)

ISBN-13: 978-1119615712

The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World

Author: Pedro Domingos

Publisher: Basic Books; Reprint edition (February 13, 2018)

ISBN-13: 978-0465094271

Superintelligence: Paths, Dangers, Strategies

Author: Nick Bostrom

Publisher: Oxford University Press; Reprint edition (May 1, 2016)

ISBN-13: 978-0198739838

The Engineering Communication Manual

Author(s): Richard House, Richard Layton, Jessica Livingston, Sean Moseley

Publisher: Oxford University Press (January 8, 2016)

ISBN-13: 978-0199339105

Storytelling with Data: A Data Visualization Guide for Business Professionals

Author: Cole Nussbaumer Knaflic

Publisher: Wiley (November 2, 2015)

ISBN-13: 978-1119002253

How Not to Be Wrong: The Power of Mathematical Thinking

Author: Jordan Ellenberg

Publisher: Penguin Books (Mar 26, 2015)

ISBN-13: 978-0143127536

Our Final Invention: Artificial Intelligence and the End of the Human Era

Author: James Barrat

Publisher: St. Martin's Griffin; Reprint edition (February 17, 2015)

ISBN-13: 978-1250058782

Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking

Author(s): Foster Provost, Tom Fawcett

Publisher: O'Reilly Media (July 27, 2013)

ISBN-13: 978-1449361327

Outliers: The Story of Success

Author: Malcolm Gladwell

Publisher: Back Bay Books (June 1, 2011)

ISBN-13: 978-0316017930

The Visual Display of Quantitative Information

Author: Edward Tufte

Publisher: Graphics Press; 2nd edition (January 1, 2011)

ISBN-13: 978-0961392147

Mindset: The New Psychology of Success

Author: Carol Dweck

Publisher: Ballantine Books (December 26, 2007)

ISBN-13: 978-0345472328