



ISE 534 - Data Analytics Consulting
Time: Two 110-Minute Lectures /Week
Units: 4.0

Instructor: Saeed (SID) Mohasseb

Office: N/A

Office Hours: 3:00 to 4:00 on Mondays with prior appointment PLUS:

Special One on One or team remote automated calendaring system:

<https://mohasseb.as.me/schedule.php>

Contact Info: Email: Sid@Mohasseb.com Cell: 949-254-9280

General timeline to respond to emails & calls: within 48 hours.

Teaching Assistant: TBD

Office Hours: TBD

Contact Info: TBD

Course Description

Consulting project concepts, frameworks, analytical tools, and managerial skills with a focus on the use of data analytics, design thinking and insight-driven frameworks.

Course Overview

The course offers hands on project centric and experiential learning in using technical data analytics elements and business and execution factors. The course uses an industry driven approach via client(s) participation through specific project(s) in order to guide students to learn problem resolution methods as data analytics consultant by: i) understanding business requirements and value propositions, ii) defining the best technical approaches to solve the problem, iii) modeling technical solutions, iv) developing business sensitive presentations, and V) interacting with clients while practicing effective project management. The course will also employ various cases to explore concepts and methods. Students are trained to think and perform as a consultant addressing analytics and business challenges.

Learning Objectives:

- Describe effective business requirements gathering for an analytics consulting engagement.
- Interface with clients and gain agreement on key business value propositions
- Manage client expectations and incremental solution development through effective project management and team dynamics.
- Apply design thinking in data analytics solution development.
- Use data and analytics methods to frame and solve complex business problems.
- Explain analytics convergence to results based on business needs, as well as execution / technical limitations and external influencing factors.
- Create reports, visualizations, and presentations to deliver analysis results to a business audience.
- Deliver a compelling and value centric story to connect analysis with business outcomes as a consulting team.
- Use analytics on cases to assess and predict short- and long-term business impacts, as well as broad legal and privatization factors.
- Use programming to generate visualizations needed to effectively interface with users and communicate business value.
- Learn to apply sensitivity analysis on key input variables/parameters.
- Learn whether the best decision continues to be best as one or more inputs change.
- Build simulation models to estimate the performance of the system of interest under different scenarios.

Prerequisite(s): ISE-529 Predictive Analytics.

Recommended Preparation:

Working knowledge of machine learning techniques as provided by ISE 529. Basic understanding of Statistics and statistical modeling as in ISE 225 Engineering Statistics I.

Course Notes:

All class slide presentations will be posted to Blackboard prior to the class. The course will use videos from various sources. Video links will be provided in the class presentation. A number of cases and articles will be used to explore concepts. Cases and articles can be purchased from Harvard Business School Press Site (HBSP). Additional reading, otherwise not available for purchase, will be provided via The Backboard.

Required Readings and Supplementary Materials:

Readings of defined book chapters, cases and articles prior to the class is mandatory.
Readings, cases and articles can be found at:

<https://hbsp.harvard.edu/import/1129905>

Cases and Articles:

- Case #1 – UberEats (Provided on Blackboard)
 - Case # 2 – Kiana Analytics – CLASS PROJECT (link to data to be provided in class)
 - Case #3 - Dow Chemical Co. - Big Data in Manufacturing; IVEY Publishing W17696; November 2017 (find @HBR site as directed)
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- Article #1 - Design Thinking Ready for Prime Time; David Kelly; Harvard Business School: ROT207 find @HBR site as directed)
 - Article #2 - Introduction to Design Thinking; Institute of Design at Stanford University (Provided on Blackboard)
 - Article #3 – What is design Thinking – McKinsey & Company (Provided on Blackboard)
 - Article #4 - GE's Big Bet on Data and Analytics (find @HBR site as directed)
 - Article #5 – Why GE digital folded? By Alex Moazed (Provided on Blackboard)
 - Article #6 - The 7 Sins of Performance Measurement, MIT Sloan; By: Michael Hammer; SMR241 (find @HBR site as directed)
 - Article #7 - Harnessing The Power Of External Data - McKinsey & Company (Provided on blackboard)
 - Article #8 (optional) – The Elements of Good Judgement – HBR (Provided on Blackboard)

Textbooks:

1. Storytelling with Data: A Data Visualization Guide for Business Professionals; by Cole Nussbaumer Knaflic - ISBN- 13: 978-1119002253; Chapters 1 thru 10
2. Recommended: The Caterpillar’s Edge: Evolve, Evolve Again and Thrive in Business; by Sid Mohasseb; ISBN-13: 978- 0996636315; Chapter 1 thru 8.
3. Recommended: Mastering Tableau; by Marleen Meier and David Baldwin. ISBN 978-1800561649
4. Recommended: Business Analytics; by Christian Albright and Wayne Winstong. ISBN 978-9355734198

Grading Policies and Breakdown:

Exams:

Students receive an individual grade (not as a team) on the Mid-term and the Final exams which will include all material covered in class as well as all assignments (cases, articles, video content, and book chapters) up to the point / date of the exams (final will include all material covered in the semester). Exams may include short essays as well as true / false, multiple choice and fill in the blank questions. Exams may include both in-class and take-home components.

Participation:

Students receive an individual (not as a team) participation grade. Effective participation is about contribution to the learning process and not a function of attendance. You are expected to:

- Be prepared to discuss cases, articles, and client projects actively / You are expected to add value to the class discussions – note: Positive participation is thoughtful contribution. Offering points and counterpoints aimed at exploring concepts are encouraged – purposeless argumentation is discouraged.
- Although during class discussions you may be asked to participate, you are expected to show initiative by proactive contribution and involvement in discussions.
- Team participation / peer review scores for client project (class project) will contribute to your overall participation grade.

To improve communication and facilitate the participation process, certain survey and polling tools may be utilized in class to capture interactive responses.

Client Project:

The class project will be based on client (s) needs and is the largest component of your grade. It is divided into two phases and each phase will get a separate grade. ALL team members will get the same grade based on the team's performance.

- Phase I of the project focuses on the approach and results for requirements gathering, identification & framing the problem, initial data exploration thoroughness, project management, effective and creative hypothesis and solution approach (es) and appropriateness of analytics methodologies proposed for solving the client's challenge and creating business value.
- Phase II of the project focuses on project management, effective convergence of analytics efforts to results, depth and scope of analytics, outcomes relevant to addressing value creation, effective visualization, simulated scenarios, storytelling and client expectation management and meeting project objectives.

Project Delivery Timeline:

- Week 7/8: Phase I - **Problem Definition & Solution Approach**: delivery of a report and a presentation centered around framing the problem they will be solving for the client (the project) and the solution they are proposing –grades will be based on a number of contributing factors including ranging from technical effectiveness to business value delivery.
- Week 14: Phase II – **Solution Formulation & Presentation** - delivery of a report, a presentation and physical visualizations / models centered around solving the identified challenge / problem – grades will be based on a number of contributing factors including business value creation, practicality (achievability & replicability), use of simulation, effective visualization, and clear storytelling with data, etc.

Grading Breakdown:

<u>Assignments</u>	<u>Points</u>	<u>% of Grade</u>
EXAMS / TESTS		
Mid-Term	100	10.0%
Final Exam	150	15.0%
ATTENDANCE AND CLASS PARTICIPATION	150	15.0%
CLIENT PROJECT		
Phase I – Problem Definition & Solution Approach	250	25.0%
• Clarity of Problem Definition (20% = 50pts)		
• Clarity of value proposition (20% = 50pts)		
• Proposed Solution Technical Approach (20% = 50pts)		
• Data Manipulation / Investigation / Exploration / use of cloud (10% = 25pts)		
• Defensibility / Effective Change of Frame of Reference (10% = 25pts)		
• Proposed Solution Replicability (10% = 25pts)		
• Report, Presentation & Story (10% = 25pts)		
Phase II – Solution Formulation & Presentation	350	35.0%
• Responsiveness of the Solution (15% = 52pts)		
• Proven Business Value Creation (15% = 53pts)		
• Achievability (can it be done or is it academic) (10% = 35pts)		
• Connectivity (broader use of signals) (10% = 35pts)		
• Interface (Visuals) & Scalability (11% = 40pts)		
• Modeling Soundness & Simulated Demonstration (13% = 45pts)		
• Defensibility / Effective Change of Frame of Reference (9% = 30pts)		
• Replicability of the Solution - not one-time optimization (10% = 35pts)		
• Report, Presentation & Story (7% = 25pts)		
TOTAL	1,000	100.0%

Course final grades will be determined using the following scale

A	95-100	B	83-86	C	73-76	D	63-66
A-	90-94	B-	80-82	C-	70-72	D-	60-62
B+	87-89	C+	77-79	D+	67-69	F	59 & below

Course Schedule: A Weekly Breakdown (Page 1 of 2): *As of June 1st 2023 (subject to change based on actual class progress & activities)*

Dates:	Topics/ Activities	Readings and Homework	Deliverables and Due Dates
Week 1 Jan 8	<ul style="list-style-type: none"> • Administrative Review <ul style="list-style-type: none"> ○ In Class Student Introductions ○ Class Policies & Grading / Objectives 	<ul style="list-style-type: none"> • Critical Thinking Video & Discussion • In class assessment survey – self-expression. • OPTIONAL Article #8: The elements of Good Judgement 	<ul style="list-style-type: none"> • <i>Note: Team Assignment Finalized next week & be ready to discuss the assigned case & Articles Next week</i>
JAN 15 Martin Luther King’s Day >> No class Labor Day > No Class			
Week 2 Jan 22	<ul style="list-style-type: none"> • Design Thinking and Analytics - intro • The Consultant’s journey Overview • Introduction to class project – KIANA • Design thinking group exercise 	<ul style="list-style-type: none"> • Article # 1 - Design Thinking Ready for Prime Time • Article #2 – An Introduction to Design Thinking – Process GUIDE • Article #3 – What is Design Thinking by McKinsey • Case #1 - UberEats 	<ul style="list-style-type: none"> • DUE: Project team selection finalized • DUE: Be Ready for Article #1, #2 ,#3 Discussion • <i>Extra Credit Details for Book Brief Discussed</i> • CLINET DATA AVAILABLE
Week 3 Jan 29	<ul style="list-style-type: none"> • Q&A / Review • Value Creation & Stake holders • Project (Kiana) first delivery discussions • Design thinking group exercise focused on Kiana 	<ul style="list-style-type: none"> • First project deliverable 	<ul style="list-style-type: none"> • Be ready fo Q&A from last session • DUE: FIRST PROJECT DELIVERY: business environment & competitive landscape report: Landscape canvas and value chain report – APPLY DESGIN THINKING – <u>NOTE: 2-page maximum report forma</u>
Week 4 Feb 5	<ul style="list-style-type: none"> • Q&A / Review • The Consulting Journey / Project capture to delivery steps • Convergence to results – Funnel Models (data analytics & Business) • Frameworks: Requirements, Interviews & Onboarding • Interview & Requirement Gathering Framework 	<ul style="list-style-type: none"> • GE Article #4 - GE's Big Bet on Data and Analytics – discussion <get from HBR link> • Article #5- Why GE Digital Failed – find on blackboard 	<ul style="list-style-type: none"> • Be ready to discuss Article #3 & the Extra GE article on blackboard. • Be ready for lecture Q&A • Be ready for Q&A from last session.
Week 5 Feb12	<ul style="list-style-type: none"> • Q&A / Review • Conversation With The Client • Analytics , data buckets and more 	<ul style="list-style-type: none"> • SPEAKER / CLIENT IN CLASS 	<ul style="list-style-type: none"> • DUE - SECOND PROJECT DELIVERY: <ol style="list-style-type: none"> 1. Interview guide for client discussion 2. First level understanding of data quality / issues / opportunities 3. Data clarification Questions 4. Initial Problem exploration report <u>NOTE: provided report format.</u>
FEB 19 President’s Day >> No Class			
Week 6 Feb 26	<ul style="list-style-type: none"> • Q&A / Review • Review of project success criteria • Interactive Team Coaching sessions <ul style="list-style-type: none"> ○ Live session on Ideation ○ Exploration results discussion – Alternative problems ○ Prioritizations ○ Initial Problem exploration 	<ul style="list-style-type: none"> • TEAM MEETING #1 / individual Team Sessions 	<ul style="list-style-type: none"> • DUE: THIRD PROJET DELIVERY: <u>NOTE: 5-page maximum report.</u> <ol style="list-style-type: none"> 1. Detailed Work Stream Assignment > next 6 weeks / outcome plan 2. Second level understanding of data quality / issues / opportunities - post client feedback 3. External Data sources identified and logic of use developed. 4. High Level Problem Resolution Approach Statements & Resulting value creation expectations.

Dates:	Topics/ Activities	Readings and Homework	Deliverables and Due Dates
			5. Data Genome vs. signal Buckets
Week 7 Mar 4	MID TERM – ON LINE REMOTE	<ul style="list-style-type: none"> MID TERM – Online using blackboard testing capabilities and more. (open book & notes – no friends) – students have to be on line while taking the test with camera’s and microphones open. 	<ul style="list-style-type: none"> Mid-term covers all material covered to this point.
MAR 11	SPRING BREAK >> No Class		
Week 8 Mar 18	<ul style="list-style-type: none"> Data Visualization & Story telling fundamentals Storytelling with Data Paths to Insight Pre-midterm review 	<ul style="list-style-type: none"> Story / Data Book #2: Ch: 9 & 10 	<ul style="list-style-type: none"> Be ready to discuss Assigned reading Note: Be prepared for the mid-term exam
Week 9 Mar 25	<ul style="list-style-type: none"> Project Phase I presentation 	<ul style="list-style-type: none"> Mid-point Presentations & reports 	<ul style="list-style-type: none"> Project Deliverable #4 + PowerPoint Presentation DUE – hard copy in class.
Week 10 Apr 1	<ul style="list-style-type: none"> Mid-term & project results review Discussion of the 7 performance Sins Art & Science of Story Telling Addictions & Biases Optimization vs. Strategic Approach to Analytics 3 minute story exercise “Hands On” activity for Story Formation 	<ul style="list-style-type: none"> Article #6 – 7 Sins of Performance Managment Story / Data Book #2: Ch: 1,2,3, 4, 5,6,7 & 8 	<ul style="list-style-type: none"> Be prepared to discuss Articles & book sections. Be prepared to discuss All chapters of Storytelling book next week. Be ready for class discuss around your final solution approach and your draft story.
Week 11 Apr 8	<ul style="list-style-type: none"> Q&A / Review Lecture on Sensitivity Analysis & More Interactive Team Coaching sessions. <ul style="list-style-type: none"> Phase I feedback Final Technical Approach Final Solution Definition Quick Look at the Models & Results Story Framework – 3 min pitch 	<ul style="list-style-type: none"> TEAM MEETING #2 / Individual Team Sessions Decisions Under Uncertainty and Sensitivity Analysis + Montecarlo Simulation 	<ul style="list-style-type: none"> DUE: FIFTH PROJECT DELIVERY: <ol style="list-style-type: none"> Final technical Approach To Solve the defined problem Adjusted problems & Solution statements Finalized Solution Framework against clear business value propositions
Week 12 Apr 15	<ul style="list-style-type: none"> Dow Chemical – Big Data In Manufacturing Signal Identification & Assignment Exercise Interactive Class Discussion <ul style="list-style-type: none"> Story line Review Model Results & Business Value Success Metrics 	<ul style="list-style-type: none"> Dow Chemical Co.: Big Data in Manufacturing – Case #3 Dow Consulting in class case Article#7: Harnessing The Power Of External Data 	<ul style="list-style-type: none"> Be ready to discuss Dow Chemical Co.: Big Data in Manufacturing Be ready to discuss Article #7 – Harnessing the power of External Data Due: extra Credit brief.
Week 13 April 22	<ul style="list-style-type: none"> In class student evaluation Final Presentation 	<ul style="list-style-type: none"> Presentation & Client Discussion 	<ul style="list-style-type: none"> DUE: SIXTH & FIAL PROJECT DELIVERY: Phase II report and PowerPoint + Verbal Presentation
Final Exam: May 6th, 2024 – same time as regular class			

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.