USC Viterbi School of Engineering

ISE 534 – Data Analytics Consulting

Units: 3.0

SPRING 2023 – Monday – 4:00 to 6:50 pm

Location: As per Schedule

Instructor: Sid Mohasseb

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

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

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

Special One on One or team remote automated calendaring system: https://mohasseb.as.me/schedule.php

Teaching Assistant: TO BE Announced

Contact Info: TO BE Announced

Office: TBD| Office Hours: TBD | Tel: TBD

LAST REVISION January 2 , 2023

Catalog Course Description:

Concepts, frameworks, analytical and managerial skills for leading and adding value to consulting projects focusing on using data analytics, design thinking and insight driven frameworks.

Course Description: The course offers hands on project centric and experimental 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 and practicing effective project management. The course will also employ various cases to explore concepts and methods. Student are trained to think and perform as a consultant addressing analytics and business challenges.

Learning Objectives: Upon successful completion of this course, students will be able to:

1. Describe effective Business requirements gathering for an analytics consulting engagement
2. Interface with clients and gain agreement on key business value propositions
3. Manage client expectations and incremental solution development through effective project management and team dynamics
4. Apply design thinking in data analytics solution development
5. Use data and analytics methods to frame and solve complex business problems
6. Explain analytics convergence to results based on business needs, as well as execution / technical limitations and external influencing factors.
7. Create reports, visualizations and presentations to deliver analysis results to a business audience
8. Deliver a compelling and value centric story to connect analysis with business outcomes as a consulting team.
9. Use analytics on cases to assess and predict short- and long-term business impacts, as well as broad legal and privatization factors.

Prerequisite(s): ISE 529 Predictive Analytics.

Recommended Preparation:
Working knowledge of machine learning techniques as provided by ISE 529. Basic knowledge of Statistics and statistical modeling.

Course Notes: All class slide presentations will be posted to Blackboard prior to the class. The course will use videos from various sources. The 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 blackboard.

Description and Assessment of Assignments: Assignments will be discussed in class and success / failure criteria provided when applicable.

Additional Policies: Except when specifically indicated during interactive working sessions or specific polling activities – laptop or phone use is not allowed in the class.

Assignment Rubrics: Criteria for grading the class project will be provided in class.

Assignment Submission Policy: All assignments MUST BE SUBMITTED IN CLASS. Assignments / presentations / reports must be printed and stapled together and prepared according to the length and content guidelines provided in the syllabus. LATE SUMBISSIONS will not be accepted or get any partial grades unless 1) the delayed submission is agreed to in advanced by the professor in writing (email) or 2) health issues preventing the student to deliver the assignment on time can be proven. If you are unable to attend class on the day any particular assignment Is due, it is the student's RESPONSIBILITY to make arrangements for it to be delivered to the classroom by the start of class. Late or not, however, you must complete all required assignments to pass this course.

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/1014099

Cases & 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
- Article #1 - Design Thinking Ready for Prime Time; David Kelly; Harvard Business School: ROT207
- Article #2 - Introduction to Design Thinking; Institute of Design at Stanford University (provided on Blackboard)
- Article #3 - GE's Big Bet on Data and Analytics
- Article #4 - The 7 Sins of Performance Measurement, MIT Sloan; By: Michael Hammer; SMR241

Textbook

- Storytelling with Data: A Data Visualization Guide for Business Professionals; by Cole Nussbaumer Knaflic - ISBN-13: 978-1119002253; Chapters 1 thru 10

Optional / Recommended

- The Caterpillar's Edge: Evolve, Evolve Again and Thrive in Business; by Sid Mohasseb; ISBN-13: 978-0996636315; Chapter 1 thru 8.

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 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, 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 11/12: **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)
- Week 13/14: **Consolidated Client report and presentation** of results to clients: The best solutions selected by the client based on business value and implementability will qualify for a bonus grade equivalent to 5% of total grade.

Grading Breakdown:

Assignments	Points	% of Grade
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 • Clarity of Problem Definition (20% = 50pts) • Clarity of value proposition (20% = 50pts) • Proposed Solution Technical Approach (20% = 50pts) • Data Manipulation / Investigation / Exploration (10% = 25pts) • Defensibility / Effective Change of Frame of Reference (10% = 25pts) • Proposed Solution Replicability (10% = 25pts) • Report, Presentation & Story (10% = 25pts)	250	25.0%
Phase II – Solution Formulation & Presentation • Responsiveness of the Solution (10% = 25pts) • Proven Business Value Creation (20% = 50pts) • Achievability (can it be done or is it academic) (10% = 25pts) • Connectivity (broader use of signals) (10% = 25pts) • Interface (Visuals) & Scalability (10% = 25pts) • Modeling Soundness & Demonstration (10% = 25pts) • Defensibility / Effective Change of Frame of Reference (10% = 25pts) • Replicability of the Solution - not one-time optimization (10% = 25pts) • Report, Presentation & Story (10% = 25pts)	350	35.0%
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 Jan 3rd 2023 (subject to change based on actual class progress & activities)*

Dates:	Topics/ Activities	Readings and Homework	Deliverables and Due Dates

Week 1 **Jan 9**	• Administrative Review
	  ○ In Class Student Introductions
	  ○ Class Policies & Grading / Objectives
			• *Note: Team Assignment Finalized next week & be ready to discuss the assigned case & Articles Next week*

Jan 16	MLK's day > No Class		
Week 2 **Jan 23**	• Design Thinking and Analytics - intro • The Consultant's journey Overview • Introduction to class project - KIANA	• Article # 1 - Design Thinking Ready for Prime Time • Article #2 – An Introduction to Design Thinking – Process GUIDE • Case #1 - UberEats	• DUE: Project team selection finalized • DUE: Be Ready for Article #1, #2 Discussion • *Extra Credit Details for Book Report Discussed* • CLINET DATA AVAILABLE
Week 3 **Jan 30**	• Q&A • Value Creation & Stake holders • Project (Kiana) first delivery discussions	• Expert video Disussion (Jerzy)	• Be ready fo Q&A from last session • Be ready to discuss the expert video discussion with Jerzzy T. • DUE: **FIRST PROJECT DELIVERY:** business environment & competitive landscape report: Landscape canvas and value chain report – APPLY DESGIN THINKING – *NOTE: 2-page maximum report forma*
Week 4 **Feb 6**	• The Consulting Journey / Project capture to delivery steps • Convergence to results – Funnel Models (data analytics & Business) • Frameworks: Requirements, Interviews & Onboarding • Interview guide development • Requirement Gathering Framework	• GE Article #3 Discussion <get from HBR link>	• Be ready to discuss Article #3 • Be ready for lecture Q&A
Week 5 **Feb 13**	• Conversation With The Client • Analtyics , data buckets and more	• SPEAKER / CLIENT IN CLASS	• DUE - **SECOND PROJECT DELIVERY**: 1. Interview guide for client discussion 2. First level understanding of data quality / issues / opportunities 3. Data clarification Questions 4. Initial Problem exploration report *NOTE: provided report format*.
Feb 20	President's day > No Class		

Week 6 **Feb 27**	• Interactive Team Coaching sessions
	  ○ Live session on Ideation
	  ○ Exploration results discussion – Alternative problems
	  ○ Prioritizations
	  ○ Initial Problem exploration
		• TEAM MEETING / Indevidual Team Sessions
		• Sid / TA
			1. DUE: **THIRD PROJET DELIVERY**: *NOTE: 5-page maximum report.*
			2. Detailed Work Stream Assignment > next 6 weeks / outcome plan
			3. Second level understanding of data quality / issues / opportunities - post client feedback
			4. External Data sources identified and logic of use developed
			5. High Level Problem Resolution Approach Statements & Resulting value creation expectations
			6. Data Genome vs. signal Buckets
			• Be prepared to discuss **All chpaters** of Story telling book next week

Dates:	Topics/ Activities	Readings and Homework	Deliverables and Due Dates
Week 7 **Mar. 6**	• Visualization & Story telling fundamentals • Storytelling with Data • Paths to Insight • Art & Scince of Story Telling	• Story / Data Book #2: **ALL CHAPTERS**	• Be ready to discuss Assigned reading – ALL CHAPTERS Story / Data Book • Be prepared to share your 3 minute stories in two weeks
Mar 13	**Spring Break > No Class**		
Week 8 **Mar. 20**	• MID TERM	• MID TERM – Online using balckboard testing capabilities and more. (open book & notes – no freinds) – students have to be on line while taking the tes and PHYSICALL at CLASS on campus .	• Mid-term covers all material covered to this point.
Week 9 **Mar. 27**	• Project Phase 1 team presentations Analytics Applications – across functions and industries	• Mid-point Presentations & reports	• **Project Deliverable #4 + Powerpoint Presentation DUE.**
Week 10 **April 3**	• Discussion Article #4: 7 performance Sins • Addictions & Biases • Optimization vs. Strategic Approach to Analytics • Open Project Discussion	• Article #4 – 7 Sins of Performance Managment	• Be prepared to share your 3 minute stories • DUE: **FIFTH PROJECT DELIVERY:** 1. Final technical Approach To Solve the defined problem 2. Adjusted problems & Solution statements • Finalized Solution Framework against clear business value propositions
Week 11 **April 10**	• Dow Chemical – Big Data In Manufacturing • Hands On Activity Story Formation Signal Identification & Assignment Exercise • Interactive Class Discussion o Story line Review o Model Results & Business Value • Success Metrics	• Dow Chemical Co.: Big Data in Manufacturing – Case #3	• Be ready to discuss Dow Chemical Co.: Big Data in Manufacturing • Be ready for class discussion around your final solution structure for client story representation.
Week 12 **April 17**	• Final Presentation	• Presention & Client Discussion	• DUE: SIXTH & FIAL PROJECT DELIVERY: Phase II report and Powerpoint + Verbal Prensation • Due: extra Credit brief.
	Final Exam: LAST DAY OF CLASS April 24th > 4:00 pm to 6:50 pm >> All inclusinve		

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu
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. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710

uscsa.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

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

dps.usc.edu, emergency.usc.edu

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) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.