USC Viterbi School of Engineering
ISE 585: Strategic Management of Technology
Spring 2022

Time: Mon 5:00-7:50 pm
Location: On Campus
Instructor: Eufracio Benavides (eufracio@usc.edu)
Professor Office Hours: Office hours will be Monday 4:00 - 5:00 pm, virtual only. Email inquiries will receive a response within 48-72 hours on average.
TA Office Hours: Office hours will be Wednesday 3:00 - 4:00 pm, virtual only. Email inquiries will receive a response within 48-72 hours on average.

Course Introduction

Course description
This course introduces students to the theory and practice of engineering innovation:
- Ideation
- Dynamics
- Execution
- Assessment

Students will learn to rapidly generate and evaluate their own innovations for viability and impact, framing them in an active marketplace of ideas. Students will review the innovation practices of large and small companies alike.
ISE 585 operates like a scientific laboratory course, teaching students to rapidly iterate on generating, testing, and re-evaluating hypotheses in the context of a design process.

Course learning objectives
The course objectives focus on understanding the following:
- Ideation and thought processes: Develop entrepreneurial thought processes to accelerate ideation. Mitigate heuristics and biases in technology management.
- Dynamics and industrial structure: Analyze industry structure for technology opportunities. Recognize and create opportunities for technology convergence.
Understand historical disruption and develop forecasting skills.
- Execution and management: Organize a team to efficiently execute disruption in environments driven by engineers, users, and/or stakeholders. Optimize technology management under constraints.
- Assessment and evaluation: Assess current cutting-edge technology commercialization opportunities. Review opportunities through technical, financial, and strategic lenses, and integrate in systems engineering practice.

In addition, you will learn the following skills:
Critical thinking: Create hypotheses, gather data through primary and secondary research sources, and draw conclusions in environments of high uncertainty
Collaboration: Share ideas and form group work products in impromptu and organized team environments without formal structure
Communication: Create and deliver concise, compelling oral and written presentations; convey the essence of the critical thinking process and defend conclusions rationally.

ISE 585 Spring 2022
Strategic Management of Technology

Required reading materials
Readings as specified on Blackboard or provided in links. See below.

Prerequisites and/or recommended preparation
Must be an engineering upper-division or graduate student.

University Guidelines

Retention of graded coursework
Graded work affecting the course grade will be retained for one year after the end of the course if the graded work has not been returned to the student (i.e., if I returned a graded paper to you, it is your responsibility to file it, not mine). Files submitted on Blackboard are archived there.

Technology policy
Laptop and Internet usage is not permitted during academic or professional sessions unless otherwise stated by the respective professor and/or staff. Use of other personal communication devices, such as cell phones, is considered unprofessional and is not permitted during academic or professional sessions. ANY e-devices (cell phones, PDAs, iPhones, Blackberries, other texting devices, laptops, iPods) must be completely turned off during class time unless otherwise specified. Upon request, you must comply and put your device on the table in off mode and FACE DOWN. You might also be asked to deposit your devices in a designated area in the classroom. Videotaping faculty lectures is not permitted due to copyright infringement regulations.

Statement for students with disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.– 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776. For more information visit www.usc.edu/disability .

Statement on academic integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, (www.usc.edu/scampus or http://scampus.usc.edu) contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/ . Failure to adhere to the academic conduct standards set forth by these guidelines and our programs will not be tolerated by the USC community and can lead to dismissal. It is a violation of USC's Academic Integrity Policies to share course materials with others without permission from the instructor. **No**

student may record any lecture, class discussion or meeting with me without my prior express written permission. The word "record" or the act of recording includes, but is not limited to, any and all means by which sound or visual images can be stored, duplicated or retransmitted whether by an electro-mechanical, analog, digital, wire, electronic or other device or any other means of signal encoding. I reserve all rights, including copyright, to my lectures, course syllabi and related materials, including summaries, PowerPoints, prior exams, answer keys, and all supplementary course materials available to the students enrolled in my class whether posted on Blackboard or otherwise. They may not be reproduced, distributed, copied, or disseminated in any media or in any form, including but not limited to all course note-sharing websites. Exceptions are made for students who have made prior arrangements with DSP and me. Students are expected to be familiar with USC's Academic Integrity Policies (i.e., copying, fraudulent possession of an exam, plagiarism, submission of purchased papers, submitting the same assignment to more than one instructor) and be aware of recommended sanctions (i.e., F for the course, suspension or expulsion) associated with violating such policies. See Appendix A in the SCAMPUS Guidebook for more detail.

Class notes and recordings policy
Notes or recordings made by students based on a university class or lecture may only be made for purposes of individual or group study, or for other non-commercial purposes that reasonably arise from the student's membership in the class or attendance at the university. This restriction also applies to any information distributed, disseminated or in any way displayed for use in relationship to the class, whether obtained in class, via email or otherwise on the Internet, or via any other medium. Actions in violation of this policy constitute a violation of the Student Conduct Code, and may subject an individual or entity to university discipline and/or legal proceedings.

Emergency preparedness/course continuity
In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.
Please note that you should be using Blackboard regularly for this class anyway, but it is particularly critical in an emergency. USC's Blackboard learning management system and support information is available at blackboard.usc.edu.

<div align="center">Course Notes</div>

Class experience
ISE 585 is not a "spectator" sport, but is rather a combination laboratory and lecture course. We will use lecture, class exercises, case studies, individual and group projects, and guest lectures. You will learn tools to create and analyze potential opportunities, and you will apply these tools in class discussions. You will benefit the most from this class if you complete all the required readings and participate in class discussions.
To achieve these objectives through a stimulating and active learning experience, the course will be centered on discussion rather than on lectures. We will use a variety of methods including problem-solving class exercises, role-playing activities, individual and group projects, and guest lectures. Evaluation will focus on the use and application of content rather than the simple acquisition of content, emphasizing your ability to understand the "so what?" of new information.

Blackboard communication
Course communication will take place through announcements in class, emails, and on Blackboard (blackboard.usc.edu). All emails will go through Blackboard; therefore, it's imperative that you have a fully operational Blackboard account with a current and correct email address posted. You are responsible for regularly checking Blackboard for announcements and new materials as well as to deliver your assignments. Emails rejected because your account is full will not be re-sent.

Technology use
Classes will be conducted in person. Cell phone usage is forbidden in class unless explicitly requested and approved by instructor in advance (for example, part of report activity). Laptop/tablets may be used for note taking, however, other application usage (ie, IM, internet, txt, etc) will be highly frowned upon. There is no point in attending a participation-intensive course if you are focused on another activity.

Flexibility in course plan
Community leaders may appear as guest speakers, if this occurs we may adjust the course plan to accommodate their schedules. Please be flexible as my goal is to give you a highly experiential classroom. This course plan may be modified as the semester proceeds; I will give you ample warning and current information will be posted on Blackboard.
In addition, while the class is highly structured, I will modify the plan if necessary to accommodate student desires and backgrounds. Special projects are encouraged, upon approval. Your expectations are important!

Guests and invited speakers
We may have guests or invited speakers. You are expected to be prompt so you can greet them at the beginning of class.

Grading Policies

Introduction
Do not skip this section as the following guidelines apply to ALL assignments without exception. You will be penalized if you do not follow them.

Assignment submission policy
Assignments must be turned in by the due date. They must be submitted electronically via Blackboard. Any assignment turned in late, even if by only a few minutes, will receive a grade deduction in the following way:
- 24-48 hours after due date: 20% penalty
- After 48 hours: No credit will be given

Additional notes
- If your internet service breaks down on the due date, you must notify Professor immediately and provide evidence of situation.
- If you are unable to attend class on that day, make arrangements for it to be delivered to the classroom by the start of class.

- You are certainly encouraged to submit files before the deadline. Please keep copies of all your files and emails until the end of the semester.
- No hard copies will be accepted. Ever!
- Late or not, you must complete all required assignments to pass this course.

Teams
- Teams must consist of ~3-4 people.
- One team member should email the roster to Professor
- No changes in team composition will be accepted after teams are formed. You are indeed stuck.
- All teammates will receive the same grade on team submissions. You will have the opportunity to evaluate your teammates in a peer review process at the end of class.

Evaluation of class participation
The attendance, participation, and class exercises portion of the grade is 80 points (8%) and is evaluated in a number of ways. Obviously, participation requires attendance. It is impossible to earn a participation grade if you are not in class. Missing more than one class sessions during the semester will affect the participation grade.

Attendance at all class sessions is critical to the participation component of the course and to learning in general as we will discuss material not found in any textbook; in addition, we will undertake a number of in-class exercises and strategy-building sessions that require your regular attendance. As part of the emphasis on successful teamwork, you will be evaluated on your ability to listen to and learn from others. Please arrive on time so as not to disturb the class, a guest speaker, or interrupt the professor.

English as a second language
If English is your second language, you are still expected to participate. We are here to learn from and teach one another, and thus your classmates who are native English speakers are expected to help create a friendly environment for you to practice your new language skills.

Evaluation scheme
To achieve an A or A- in this class, you will need to go well beyond the minimum requirements as stated in the syllabus in terms of the quality of your work and your involvement in and contribution to the class. An A is a sign of superior work and, much like the efforts of innovators, reflects the fact that you stood out from the crowd. There is no hard curve for this course.

Syllabus Topics, Assignments, Grading

WK#	Date	TOPICS	BY:	AD#	Assignment Deliverable	Max Pages	Team	Student
1	10-Jan	Introduction, Expectations, Overview	Prof					
2	17-Jan	--- Holiday ---			--- Holiday ---			
3	24-Jan	Technology	Prof	AD01	Article Report #1	2 (report)		30
4	31-Jan	Strategy vs Tactics vs Execution	Prof	AD02	Potential Concepts Report	2 (report)		50
5	7-Feb	Dynamics – Team, Stakeholders, Industry	Prof	AD03	Article Report #2	2 (report)		30
6	14-Feb	Concept Presentation	Class	AD04	Concept Presentation	12 (charts)	75	
7	21-Feb	--- Holiday ---			--- Holiday ---			
8	28-Feb	Opportunity vs Solution	Prof	AD05	Down-Select Report	15 (report)	100	
9	7-Mar	Tech, Financial, Strategic – Systems Eng	Prof	AD06	External Peer Review	5 (report)		75
10	14-Mar	--- Holiday ---			--- Holiday ---			
11	21-Mar	Evolution Strategy Presentation	Class	AD07	Evolution Strategy Presentation	17 (charts)	125	
12	28-Mar	Decision Making, Comp Intel, Data Analytics	Prof	AD08	Article Report #3	2 (report)		30
13	4-Apr	Success, Goals, Profit	Prof	AD09	Article Report #4	2 (report)		30
14	11-Apr	Recap / Invited Lecturer	Guest	AD10	Internal Peer Review	5 (report)		75
15	18-Apr	Next Gen, Revolutionary, Evolutionary, Innovation	Prof	AD11	Due Diligence report	25 (report)	125	
16	25-Apr	Opportunity Pitch (1-X teams)	Class	AD12	Opportunity Pitch	22 (charts)	175	
17	2-May	--- Study Days ---						
18	9-May	Back Up -- *Opportunity Pitch (x-y)*	Class		Participation	N/A		80
					SUBTOTAL		600	400
					GRAND TOTAL		1000	

General Assignment Descriptions

Article Reports: Student interpretation of pros, cons, highlights within article. Hint, professor has read articles many times over, not looking for paraphrased summary, emphasis on student interpretation.

Potential Concepts Report: Student will describe one or more potential technology concepts for semester focus.

Concept Presentation: Team presentation of selected technology. Content to be presented will be addressed in lectures.

Down-Select Report: Based on Concept Presentation this report should offer detailed insight and description of all the material presentation. Examples include but are not limited to decision making process, formulas, detail technology description, references, alternative options considered but not pursued, etc.

<u>Evolution Strategy Presentation</u>: Stemming from Concept Presentation, this presentation should address new lecture topics as well as enrichment of previous. Hint, no change to previous may result in equivalent score which is fine but this total is higher.

<u>External Peer Review</u>: Each student is to assess all the other teams and offer their own interpretation of pros, cons, areas of improvement, and overarching summary. Using professor rubric is minimum expectation. To heighten candidness, content remains with Professor and TA only, submitted reviews will NOT affect other team scores/grades.

<u>Internal Peer Review</u>: Each student is to assess the teammates within their group. The report should offer student interpretation of pros, cons, areas of improvement, and overarching summary for each teammate. Using professor rubric is minimum expectation. To heighten candidness, content remains with Professor and TA only, submitted reviews will NOT affect teammate scores/grades.

<u>Due Diligence Report</u>: Based on both Concept and Evolution Presentations and down Select report, this report should be a culmination of detailed insight and description of all the material presentation. Examples include but are not limited to decision making process, formulas, detail technology description, references, alternative options considered but not pursued, etc. This should be the concrete foundation for all content supporting the Opportunity Pitch. Hint, no change from Down Select report may result in equivalent score which is fine but this total is higher.

<u>Opportunity Pitch</u>: Stemming from both Concept and Evolution Presentation, this presentation should address <u>new lecture topics</u> as well as enrichment of previous. Hint, no change to previous may result in equivalent score which is fine but this total is higher.

Sample of Group Presentation Outline
The table outline below depicts a sample outline for class presentations. All time allotments per group will be strictly enforced. There will be no penalty for going over time because going over time allotment will not be permitted – the group is done when the time expires. The transition will be used to allow one group to prep for start and the other to tear down for departure.

#	Minutes	CONCEPT PRESENTATION	Presented By:
	10	Kickoff	
1	15	Topic 1	Group 1
	5	*transition*	
2	15	Topic 2	Group 2
	5	*transition*	
3	15	Topic 3	Group 3

Evaluation of your written work
You may regard each of your submissions as an "exam" in which you apply what you've learned according to the assignment. I will do my best to make my expectations for the various assignments clear and to evaluate them as fairly and objectively as I can. You will have the grading rubric in advance to understand the assignment requirements. If you feel that an error has occurred in the grading of any assignment, you may, within one week of the date the assignment is returned to you,

write me a memo in which you request that I re-evaluate the assignment. Attach the original assignment to the memo and explain fully and carefully why you think the assignment should be re-graded. Be aware that the re-evaluation process can result in three types of grade adjustments: positive, none, or negative.

Readings and classroom exercises

On the day the readings will be discussed, please come to class prepared to contribute your analysis and insights on what you have read. This will contribute to the participation portion of your grade. There are no written assignments associated with the reading list. However, the readings will be discussed actively and in detail during class sessions, particularly in small groups. Your participation evaluation also depends on your participation in these exercises.

Assignment formats

- No hard copies will be accepted for any work. Submit everything on Blackboard.
- All submissions must be in PDF files. No other formats are accepted, including Word, Pages, OpenOffice, GoogleDoc, PowerPoint, Keynote, or others.
- Documents must be written in 12 pt or a similar font, with 1" margins, and single-spaced.
- All documents exceeding 1 page in length must have headers containing page numbers and the file name on all pages. Individual assignments should be labeled as follows: lastname_assignmentname (i.e. Adams_Self-assessment).
- Team submissions should be labeled by the team number – i.e., Team5_Assignment.
- Blackboard should be configured such that one teammate submits the team submissions; please check your teammates' work.
- If you make an error and submit the wrong file, do not email it to me. The version on Blackboard is the final submission.
- I will post all responses to your assignments in Blackboard. It is highly encouraged that you review these before the end of the semester.

Peer review

This class is designed to enhance your collaboration skills. You will conduct several projects to be conducted in teams. At the end of the semester, you will have the opportunity to review your teammates; your grade for this portion is the average of the grade your teammates assign you. A template and instructions will be given for this portion.

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" https://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, http://policy.usc.edu/scientific-misconduct.