

USC Viterbi School of Engineering
ISE 585: Strategic Management of Technology
Spring 2021

Time: Thurs 5:00-7:50 pm

Location: Online

Instructor: Charles Tang (tangc@usc.edu)

Office Hours with Prof. Tang: Office hours are by appointment only; emails will generate a response within 24 hours

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.

Required reading materials

Readings from HBS Publishing, available at <https://hbsp.harvard.edu>
Additional 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

Add/Drop process

If you are absent six or more times prior to the last day to withdraw from a course with a grade of “W”, I may ask you to withdraw from the class by that date. These policies maintain professionalism and ensure a system that is fair to all students.

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.

Course Notes

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 online via Zoom.

Flexibility in course plan

Because we invite community leaders as guest speakers, we sometimes are forced to 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

From time to time 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:

- First 24 hours after due date: 10% penalty
- 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 deliver a hard copy at the beginning of class on that day.
- 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

By [Friday, February 12](#), you must join a class team.

- Teams must consist of 3-4 people.
- One team member should email the roster to me by 5 pm on [February 12](#) so we can configure Blackboard properly.
- If you do not have a team by then, email me and I will address this.
- No changes in team composition will be accepted after teams are formed. You are indeed stuck.
- I will begin posting rosters as teams form. Note your team number to make things easier for all of us.
- 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 75 points (7.5%) 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 session during the semester will affect the participation grade. You will have the opportunity to do an extra credit reading assignment to compensate for a missing class.

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.

In order to give everyone a chance to participate, I use “cold call” techniques. You will get two free passes in the semester; if you are having a bad day, please let me know before class starts so we don’t make your bad day worse. Otherwise you are expected to be ready to discuss any of the readings or topics scheduled for the day.

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.

Assignment and Grading Detail

Assignment schedule

Deliverable	Max Pages	Due	Due	Team (T)	Individual (I)	%
		Week	Date			
Potential concepts	2 (report)	5	2/18	50		5%
Potential concepts presentation	10 (deck)	6	2/25	75		7.5%
Down-select presentation	10 (deck)	9	3/18	100		10.0%
Commercialization strategy	10 (deck)	11	4/1	125		12.5%
Due Diligence report	5 (report)	13	4/15	125		12.5%
Opportunity Report	5 (report)	15	4/29	100		10.0%
Opportunity Pitch	10 (deck)	15	4/29	125		12.5%
Peer Review	Excel	15	4/29		100	10.0%
Journey Review	5 (report)	15	4/29		125	12.5%
Participation					75	7.5%
TOTAL				700	300	
GRAND TOTAL					1000	100%

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, classroom exercises, and the case method

This course uses the case method heavily in illustrating the key points in the class. You must download the separate Course Session Notes on Blackboard to be prepared adequately for class on the due dates listed in the Course Plan. 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. You will be expected to change groups over the course of the semester. 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 Times New Roman 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: Yourlastname_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>.

Support Systems:

Student Counseling Services (SCS) -(213) 740-7711 – 24/7 on call

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

<https://engemannshc.usc.edu/counseling/>

National Suicide Prevention Lifeline -1-800-273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

Relationship and Sexual Violence Prevention Services (RSVP) -(213) 740-4900 -24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. <https://equity.usc.edu/>

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. <https://studentaffairs.usc.edu/bias-assessment-response-support/>

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. <http://dsp.usc.edu>

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. <https://studentaffairs.usc.edu/ssa/>

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. <https://diversity.usc.edu/>

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible, <http://emergency.usc.edu>

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.

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Provides overall safety to USC community. <http://dps.usc.edu>