



ISE495abx – Senior Design Project
Units: 4 (credited at conclusion of “b” semester)
Term—Friday —Time: 9:00 – 11:50 am

Location: SSL 202

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Course Producer: Parth Pherwani
Office: TBD
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Contact Info: Email: ppherwan@usc.edu

IT Help: <https://brightspace.usc.edu/>

Contact Info:
D2L Technical Support Line: 888-895-2812
USC Email Support: usc@d2l.com
USC ITS Support (213) 740-5555 (students dial 1)

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Course Description

Preparation and development of the senior project proposal. Open to those who have attained junior, senior standing in industrial and systems engineering.

495ax Investigate client organization operations, evaluate alternative designs to meet client needs, complete preliminary design review.

495bx Develop the detailed design including countermeasures for risks, and complete:

- critical design review.
- implement the project plan.
- close-out the project.

This course will prepare students for engineering practice through a major design experience based on the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

Learning Objectives

The students in ISE 495abx will learn to demonstrate:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Prerequisite(s):

495ax	495bx
ISE225 – Engineering Statistics	ISE 315 – Engineering Project Management
ISE382 – Database Systems	ISE 370 – Human Factors in Work & Systems Design
	ISE435 – Discrete Systems Simulation
	ISE495a – Senior Design Project

Recommended Preparation:

Both ISE 225 and ISE 382 are pre-requisites for this course. Techniques and tools used in those courses may be used extensively in this course. Use of database architecture or

database system may also be used in your project. Your knowledge of these topics and ready access to these references will be of assistance in successfully completing your project.

Course Notes

Format of the ISE Senior Project Design Sequence

The centerpiece of the 495 experience is the systems development life cycle (SDLC). The SDLC process is a multistep, iterative process structured in a methodical way to provide a framework for technical and non-technical activities to deliver a quality system. Please refer to the “Outline of Major Technical Reviews and Final Report for requirements.

Faculty (Coach’s) participation

The faculty delivering the course act as coaches, offering feedback at specific milestones and meeting regularly with individual teams to discuss activities, progress, and options; and to offer advice. It is not the faculty’s task to identify or repudiate blockers of the team’s progress. However, please review the [resources](#) at the end of the syllabus or initiate a confidential complaint to your coaches if you feel a more egregious violation has occurred.

Team participation

Students are organized into teams and each team is assigned to solve a representative industrial and systems engineering project for a client, typically a local firm, nonprofit entity, or public agency. Any number of different manufacturing, service, or business enterprises in any sector might be a source of projects. The expectation is for the team is to research a solution set to address the project parameters, use engineering techniques to reduce risk while developing a mature solution that can be thoroughly developed and tested for implementation by the client. Documentation of meetings are part of the assessment of team performance. A google drive which is shared with the coaches and team members can act as a repository for [meeting minutes](#). The hyperlink can serve as a resource for the form and style for your meeting minutes.

This is a team project activity. As such, it is expected that management of the team will be accomplished within the team. Grading for the team will be assessed to all members of the team.

Case Studies

Case studies are assigned throughout the term. These are intended to provide situational context to assist students unfamiliar with working in industry and guidance in developing the various Technical Reviews. The logistics of completing the Case Studies:

1. Complete survey for case.
2. Complete quiz for case. Survey must be completed first to have quiz appear in D2L.
3. Class participation will be graded during discussion of case.

This is an individually assessed portion of the course.

Technological Proficiency and Hardware/Software Required

- prepare professional papers and presentations in the English language using proper citation
- use multimedia in MS PowerPoint with embedded audio and/or video that begins automatically with the beginning of a presentation (Please test this. Points will be deducted if embedded media do not operate properly)
- participate in a remote meeting using the hosted technology of choice (MS Teams, Zoom, GTM):
 - with a headset
 - camera on
 - appropriate background established
- be proficient with the use of the D2L system (NO work will be accepted by email unless previous arrangements have been made)
- convert report files to PDF
- format formal paper submissions using IEEE style format and APA in text citation / reference list.

Description and Assessment of Assignments

USC is making a change in our online learning platform, and we are now using Brightspace (D2L)

How to Log In

To access Brightspace today, follow these steps:

1. Go to <https://brightspace.usc.edu/d2l/login> to login. You can also find Brightspace on myUSC.
2. Enter your USC Net ID to access
3. Begin navigating through Brightspace

We also encourage you to download the mobile app, Brightspace Pulse, available in both the [Apple App Store](#) and [Google Play](#).

What to Expect

Brightspace provides an enhanced learning experience with detailed class progress reports. With Brightspace, you can easily see all assignment due dates in one place. Upon opening Brightspace, you will find the following:

The 20243 ISE-495A: Senior Design Project Course:

We will use this course to complete work for this course throughout the semester.

Support Resources

Do you want to learn more about Brightspace? Check out training and resources in the [Brightspace Student Tutorials](#). Find technical support information below:

- **Student Guides:** [Brightspace Student Guides](#)
- **Brightspace Technical Support Line:** 888-895-2812
- **Brightspace Email Support:** usc@d2l.com

Required Readings and Supplementary Materials

Text: Product Development for Technical and Non-Technical Managers and Practitioners, 1st Ed., Lu, P. Kendall Hunt (2021), ISBN: 978-1-7924-7707-2.

Available at USC bookstore, Amazon or from publisher at: <https://tinyurl.com/4rc99deh>

Rentals are not available at this time.

Textbook Errata Sheet

Page 38 – Table 4.2 Requirements Hierarchy

Headings should read:

Customer Requirements	Functional Requirements What the system will do	Non-Functional Requirements How the system works
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Grading Notes

You must submit a completed and approved PDR to receive an IP (In Progress) grade for **ISE 495ax**. If circumstances beyond the team's control emerging after the 12th week of class, preclude this outcome, a grade of IN (Incomplete) will normally be issued, to be cleared as soon as possible during the next academic semester. Incomplete grades can usually be avoided.

Grading Breakdown

Course Component		Weight
PROJECT		
(SFR) System Functional Review (client approval required before progressing to PDR)	5%	64%
(PDR) Preliminary Design Dress Rehearsal * Exit document approval required before progressing to CDR and conclude 495a)	10%	
Meeting documentation review after PDR	8%	
(CDR) Critical Design Review (Exit document approval required before progressing to TRR)	10%	
(TRR) Test Readiness Review (Exit document approval required before to SVR)	10%	
Meeting documentation review after TRR	8%	
(SVR) System Verification Review (Final Report) (Client approval required to conclude 495ab)	13%	
CLIENT ASSESSMENT		10%
CASE STUDY		
• Individual Performance (13 Studies)		26%
Total (4-unit course; grades posted at end of 495b)		100%

*Revised 9/10/2024

Calculation of Final Grade

Students completing ISE 495ax receive a grade of IP (In Progress) at the conclusion of the semester. A letter grade is assigned for both ISE 495ax and 495bx at the conclusion of the second semester in the sequence. Students who complete ISE 495ax but do not continue in ISE 495bx the following semester receive a grade of NC (No Credit) in ISE 495ax. A grade of NC has no impact on a student's GPA, but no credit is earned for the course.

Grading Scale

Course final grades will be determined using the following scale (credited at conclusion of "b" semester)

A	93 – 100
A-	90 - 92
B+	87 – 89
B	83 – 86
B-	80 - 82
C+	77 – 79
C	73 – 76
C-	70 – 72
D+	67 – 69
D	63 – 66
D-	60 - 62
F	59 and below

NOTE: You must submit a completed and approved Final Report to receive a grade for the **ISE 495abx series**

Assignment Rubrics

Rubrics will be posted on D2L with the appropriate assignment.

Assignment Submission Policy

All work submitted for grading shall be submitted through D2L.

Format Requirements for Submissions

- Presentations: MS Power Point (*.pptx)
(NOTE: NEVER assume you can present to a client by accessing your google documents. Most companies do not allow access to google tools for security reasons)
- Documents: PDF
- Project Schedules: PDF
- Spreadsheet: MS Excel (*.xlsx)
- Visio: PDF

No assignments will be accepted by email or paper unless arrangements have been made in advance. There are no extra credit assignments or makeup assignments for missed or late work.

Additional Policies

Communications Policies

When using email to Coaches or Clients –

- Please include **course number (ISE495a or b) and client name** in subject line of emails
- Cc: all coaches in all email
- Use your USC email account when contacting the client or Coaches.
- Send Calendar invitations for meetings with clients and coaches
 - [Google](#)
 - [Apple](#) (iCloud)
 - [Outlook](#)

Copies of lecture slides and a supplementary materials / other reference guidance will be posted to D2L under *Content*.

Technical Review Dress Rehearsal Presentation Feedback

The Dress Rehearsal presentation is the review of the PDR prior to presentation to the client. As such, content should be complete and PDR ready. There is probably much more each team will want to say at this point, but the purpose of the Dress Rehearsal is only to understand and approve the strategy for the Final Presentation. Teams are strongly encouraged to make available detail information in a separate file, submitted to D2L for review if the instructors have any questions. The objective of the coaches' feedback is to position the team to execute a successful

project. Teams are sometimes asked to revise the presentation and execute it again if the coaches do not believe this standard has been met.

Please Do Not decide with the client for the Final Presentation until the presentation has been reviewed and approved by the coach, even if the client presses you to do so.

Attendance Policy

Students are expected to attend all classes and meetings unless arrangements are made in advance. Absences and late arrivals will be noted and reflected in final grading. (If you are not present, you cannot participate).

Punctuality is considered in the evaluation of performance. This relates to meetings of your team, punctual class attendance, and scheduled meetings with the instructor(s). Absence or extreme tardiness of a chronic nature will be noted. A commensurate score will be assigned if a team member is absent or late. (see corresponding rubric for details)

Policy for Use of Technology in Class

The use of technology in the classroom should be an integral part of the classroom experience. Any other use of technology is prohibited.

Schedule

The Calendar is **approximate** and **subject to change**.

Presentations are to be coordinated and scheduled with your Coach.

Week	Friday	In Class	Activity	Deliverable (5:00p Friday)
1	17-Jan			Project update with coach Schedule progress review meeting with clients Confirm CDR Plan with coach
2	24-Jan	Yes	B Review Case: Ch. 6.1 Case: Ch. 6.2	Detailed Design meeting with client
3	31-Jan			
4	7-Feb	Yes	CDR Dress Rehearsal	
5	14-Feb			CDR update to coach
6	21-Feb			CDR Presentation & Report to client
7	28-Feb	Yes	Case: Ch. 7 Case: Ch. 8 Case: Ch. 9	CDR Exit documents approved
8	7-Mar			TRR Review with Coach
9	14-Mar			TRR to client
Spring	21-Mar		Recess	
10	28-Mar			
11	4-Apr			
12	11-Apr			SVR review with Coach
13	18-Apr			
14	25-Apr	Yes	Case 10, 11, 12	SVR & Final Report Customer Acceptance
15	2-May			Final Report (revised)
Finals	May 9			

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 [Research and Scholarship Misconduct](#).

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
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 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 for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.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.

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 for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776

osas.usc.edu

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) 821-4710

campussupport.usc.edu

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

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.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

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) 442-3340 or otfp@med.usc.edu

chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.