

Description	In this course, the principles of Engineering Design will be applied. Students will work on multidisciplinary teams on selected and approved design projects, practice design methodology, complete project feasibility study and preliminary design, including optimization, product reliability and liability, economics, and application of engineering codes. Final report and presentation.		
Instructor	Alejandro Gutiérrez, Ph.D. Email: agutierrez78@ucmerced.edu, Phone: (628) 444-9492 Office Location: COB-372 Office Hours: Thursdays 11:30-13:30		
T.A.	Angela Macedo Andrade Email: amacedoandrade@ucmerced.edu Weekly meetings by appointment		
T.A.	Felipe Mojica Email: fmojica2@ucmerced.edu Weekly meetings by appointment		
Lectures	Wednesdays, 16:30-17:20. COB2-170		
Textbook	All materials will be provided by the instructor.		
Grading	Team participation	15%	
	Weekly deliverables	15%	
	Preliminary Design Review (PDR)	15%	
	Critical Design Review (CDR)	15%	
	Final Design Review (FDR)	30%	
	Final Report	10%	
	A+ = 95%-100%; A = 93%-94%; 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 = 0%-59%.		

Policies

- Attendance to class and to weekly meetings is mandatory.
- Team participation grade consists on actively working within your team. The performance of each team member will be reviewed by their peers and evaluation sheets will be turned in at each weekly meeting.
- Weekly deliverables must be presented on time at each weekly meeting. Late submissions will affect the grade of all team members regardless of who is individually responsible.
- Catcourses will be the principal means of official communication between the instructor and the students, so be sure to check your inbox often.

Learning outcomes

By the conclusion of this course, students will be able to:

- Design an engineering solution to a challenging contemporary problem, within realistic constraints and utilizing appropriate standards.
- Use project management and teamwork skills to deliver a solution within time and budget constraints.
- Deliver a professional presentation appropriate to a broad audience.
- Demonstrate effective written technical communication skills through final project reports.

Academic Integrity

- Each student in this course is expected to abide by the University of California Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work.
- You are encouraged to study together and to discuss information and concepts covered in class with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, other electronic file, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
- During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

Students with disabilities

The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. The instructor is available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Diversity and inclusion

This class is conducted in accordance to the UC Merced Principles of Community¹, which include the recognition and celebration of all identities, values, and beliefs. Discrimination on the basis of race, religion, sex, sexual orientation, gender identity, national origin, citizenship, documented status, or any other social identity will not be tolerated. All students are invited to discuss any situation they perceive as harmful or threatening with the instructor in class or during office hours.

Course schedule

Phase	Week	Deliverables
Planning	1	List of officers, first meeting (in person or remote) with client, meeting schedule with clients, meeting schedule with TA/faculty
	2	Problem translation, report on assessment of technology
Concept	3	List of constraints and objectives, mission statement, list of concepts and functioning principles
System design	4	List 2-3 possible solutions, estimated timelines, preliminary economic justification
	5	PDR
Detail design	6	Specifications of chosen solution, identifications of components
	7	Geometry and physics calculations, preliminary drawings
	8	Preliminary design of ad-hoc components, identification of off-the-shelf components
	9	Materials selection, cost estimates
	10	Detailed drawings, computational models, preliminary testing results
	11	CDR
Testing & refinement	12	Corrected designs/models based on CDR feedback
	13	Testing protocol for final product design, testing results
	14	Testing result, economic feasibility analysis
	15	Testing results, environmental impact analysis
	16	FDR & Final report

¹<http://www.ucmerced.edu/principles-of-community>