Course Description

The objective of this course is to present an overview of the methods and tools available for Design for Manufacturing and Assembly (DFMA). DFMA provides a systematic procedure for analyzing a proposed design from the point of view of assembly and manufacture and help in reducing the product cost. Topics covered in the course include the following:

- Design for Assembly
- Design for Additive Manufacturing
- Design for Machining
- Design for Composites
- Design for Injection Molding
- Design for Casting
- Design for Sheet Metal Forming
- Design for PCB Manufacturing
- Design for Automation
- Material Selection
- Geometric and Dimensional Tolerances
- Cost Estimation
- Engineering Design Making

Intended audience for this course includes product designers, manufacturing engineers, or technical managers who intend to work on product development teams and play a role in manufacturing process selection.

Learning Objectives

After completing this course students should be able to:

- Understand differences and similarities between Design for Manufacturing and Design for Assembly
- Understand and describe how product design influences cost
- Select materials and primary and secondary processes for meeting the design requirements
- Simplify assembly through part minimization and reducing the probability of errors
- Design parts to lower manufacturing costs and reduce the probability of defects during manufacturing

Prerequisite(s): N/A
Co-Requisite (s): NONE
Concurrent Enrollment: NONE
Recommended Preparation: NONE
Technological Proficiency and Hardware/Software Required

The course will be taught in a traditional classroom. Students will have access to the required hardware/software in the Center for Advanced Manufacturing.

Required Text


References


Course Grading: Regular Letter Based Grading

Assignments

- 6 Home Works (24%)
- 2 Quiz (20%)
- 2 Mini Projects (26%)
- 1 Project (25%)
- Attendance and Participation (5%)

Assignment Submission Policy

Assignment will be submitted in class.

Additional Policies

Penalty will be applied to late assignments. The full allocated points will be reduced by 10 percentage points for the day after the deadline for the submission of coursework. Score will be reduced by a further 40 percentage points each day if coursework is submitted during the following two days.
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, 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. 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. 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. 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: 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. 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. 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. 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. 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. 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. emergency.usc.edu
USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.
Provides overall safety to USC community. dps.usc.edu