San José State University
Department of Mechanical Engineering
ME 154 Mechanical Engineering Design, Section 01, Fall 2021

Course and Contact Information

|	
Class Days and Time:	Mondays and Wednesdays 2:15 PM to 3:55 PM
Classroom:	Predominantly online (link in Canvas), in-person sessions in ENG ???
Registration Code:	41697, 4 units
Prerequisites:	ME 20, MatE 25, ME 101, CE 112, all with C- or better
Corequisite:	Tech/ME 41 (either completed previously or co-enrolled)
Instructor:	Sang-Joon (John) Lee
Email:	sang-joon.lee@sjsu.edu
Telephone:	408-924-7167
Office Location:	Online only in Fall 2021 (link posted in Canvas)
Office Hours:	Tuesdays and Thursdays 10:30-11:30 (link posted in Canvas)

Course Format

This class is predominantly online, with synchronous class meetings at the scheduled class times, supplemented by occasional in-person meetings in support of project activities. The class heavily requires use of Zoom video conferencing https://sjsu.zoom.us/ and the Canvas learning management system (LMS)
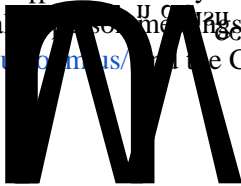
7. Determine the magnitude and location of the maximum stress (principal stresses, maximum shear stress and von Mises stress) on a component.
8. Design and analyze short and long columns.
9. Design and analyze thin and thick walled cylinders under pressure and to select proper interference fits for press or shrink fits.
10. Design and analyze ductile and brittle machine components under static loads using appropriate failure criterion.
11. Estimate the value of stress concentration factor.
12. Design and analyze machine components under cyclic loads to guard against fatigue failure.
13. Design bolted joints in tension and shear.
14. Work as a team.

Grading Information

Course Schedule

Vj ku'uej gf wng'ku'c vgpvcvkxg rncp.'uwdljgev'\q'ej cpi g y kj "wrf cvgu'\q'dg"eqo o wpkecvgf 'kp'encuu'qt 'pqvkhkecvkqp xkc 'Ecpxcu0

Dates	Topics	Related Chapters
8/23, 8/25	Course organization, linkages, joints, degrees of freedom, common planar mechanisms, mechanism classification, transmission angle, mechanical advantage, toggle positions	DoM* Ch 2, DoM Ch 3
8/30, 9/1	Graphical synthesis: motion generation mechanisms (two and three positions), adding a dyad to a mechanism.	DoM Ch 3
9/8	**Pq'encuu'o ggvkpi "qp"; I8.'kp'qdugtxcpeg'qh'Ncdqt 'Fc{+* Vectors in complex polar notation, closed loop vector equations, position analysis	DoM Ch 4
9/13, 9/15	Analytical linkage synthesis Velocity analysis	DoM Ch 5, DoM Ch 6
9/20, 9/22	Acceleration analysis	DoM Ch 7
9/27, 9/29	Mechanism kinematics review and practice **1st Midterm Exam** (launches Wednesday)	DoM Ch 2-7
10/4, 10/6	Forces on mechanisms, self-consistent free-body diagram notation Matrix solution method for linear equations	DoM Ch 11
10/11, 10/13	Review of stress and strain, principal stresses Review of combined stresses: bending, torsion. Column design	MD** Ch 4
10/18, 10/20	Failure theories for static loads: maximum shear stress theory, the distortion-energy theory for ductile materials, modified Coulomb-Mohr theory for brittle materials	MD Ch 5
10/25, 10/27	Stress concentrations, pressurized cylinders, interference fits Materials selection in design	
11/1, 11/3	Stress analysis review and practice **2nd Midterm Exam** (launches Wednesday)	MD Ch 2, MD Ch 4
11/8, 11/10	Failure theory for cyclic loads, high cycle fatigue, S-N curve Effect of mean stress on fatigue life	MD Ch 6
11/15, 11/17	Bolted joint design: thread standards, failure modes Bolt joint stiffness	MD Ch 6
11/22, 11/24	Bolt preload and joint failure **Pq'encuu'o ggvkpi "qp'33 I46='eco rwu'pqp-kpuvtwevkqpcnf c{+*	MD Ch 15
11/29, 12/1	Design Project presentations	
12/6	Semester review and practice	

* Design of Machinery textbook ** Machine Design textbook

All stubss n ns