

Professor: Greg Watkins, Ph.D., PE

Contact: O’Connell 419A / 530.898.4388 / gkwatkins@csuchico.edu

Course Description: Computer modeling, simulation, and solution of engineering problems. Applications in mechanical, thermal, and fluid flow analysis. Emphasis on proper use of current commercial software and solution verification through traditional engineering analysis.

Student Learning Objectives: To understand the fundamental, underlying operations of mechanical design and analysis software and to learn proper techniques and practices of its application to real world engineering problems.

Prerequisites: MECH 200, MECH 308, MECH 338, MECH 340

Textbook: None

Class Meetings: Monday 2:00 – 4:50 PM in O’Connell 438

Course Materials: None. Recommend Google Drive or similar account for cloud-based storage of class documents. Note: A lost, stolen, or corrupted flash drive is not an accepted excuse for missed work.

Grading: Weekly Warm-up Assignments Required submission; graded 100/50/0
 100 = no grade impact
 50 = 5-point deduction on weekly assignment
 0 = 10-point deduction on weekly assignment

100/50/0 Weekly Modeling Assignments 75%
 Final project 25%

Grade Scheme:

A	A-	B+	B	B-	C+	C	C-	D+	D	F
>= 93.3	93.2 to 89.5	89.4 to 86.7	86.6 to 83.3	83.2 to 79.5	79.4 to 76.7	76.6 to 73.3	73.2 to 69.5	69.4 to 66.7	66.6 to 59.5	< 59.5

Blackboard Learn: This course will make use of the Blackboard Learn course management system. All lectures, handouts, assignments, solutions, grades, announcements, etc. will be available on the course Blackboard page.

Electronic Assignment Submission: Electronic submission will be handled via Blackboard Learn. Students are strongly encouraged to verify submissions made through Blackboard Learn. It is the student’s responsibility to ensure the correct file has been submitted for the assignment. **No accommodations are made for incorrect submissions.** I do not accept assignments via email.

- Late Work:** All modeling assignments will have a specific due date and time. The assignment will close on Blackboard Learn at the specified time and will no longer be available. **Late work is not accepted.**
- Attendance:** Prompt attendance is expected at all class meetings. This is a technical elective course, one that you have chosen to take presumably because you want to learn the material. Persistent absences or and/or tardiness will not be tolerated. Repercussions include reduced grades on assignments and/or locking of the classroom door at 2:00 PM.
- Email:** In the event I need to contact members of the class or make urgent announcements regarding tests, class cancellations, etc., it will be done via your WildcatMail email account. I do not plan to use this method of communication frequently, but I do expect that information sent this way will be received. University policy requires students to monitor their WildcatMail accounts. If you have another preferred email provider, you may set up automatic forwarding of your WildcatMail to that address. Details are available at www.csuchico.edu/its/.
- Office Hours:** Tuesday 2:00 to 4:00 PM
Thursday 2:00 to 4:00 PM
- Academic Integrity:** By their nature, computer based assignments lend themselves to easy copying and sharing. Any sharing of electronic data constitutes a violation of the university's academic integrity policy and will not be tolerated. Violations will be referred to student judicial affairs and can result in penalties ranging from failure of the course to long term suspension from the university. See the *Academic Integrity* document for additional information.
- Americans with Disabilities Act:** If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations. ARC is located at Student Services Center 170 and may be reached at 530-898-5959 or arcddept@csuchico.edu.
- Covid:** The CSU requires students to be fully vaccinated and boosted against COVID-19 by February 28, 2022, unless you have an approved exemption. Currently, Chico State is requiring everyone on campus to wear an approved face covering in all indoor campus spaces. Accordingly, all students are required to wear an appropriate face mask covering the nose and mouth in order to participate in this course. Policies and requirements regarding COVID-19 are subject to change pursuant to campus, local, state and/or federal guidelines. Please note that dishonesty relating to the vaccination policy and/or your failure to comply with any other COVID-19 related safety policy or mandate, including the face covering requirement, may result in disciplinary action against you through the office of Student Conduct, Rights and Responsibilities, which can include suspension or expulsion from the California State

University system. Individuals unable to wear a face covering due to a medical condition should contact the Accessibility Resource Center by phone at (530) 898-5959 or by email at arcdept@csuchico.edu .

Tentative Course Schedule

Date	Topic
1/24	Introduction, Technical Memo, Linear Static FEA
1/31	Design Optimization
2/7	Assembly Modeling
2/14	Extracting Loads from Motion Studies
2/21	Nonlinear Analysis
2/28	Buckling, Drop Test
3/7	Modal, Time History, and Harmonic Analyses
3/14	No Class – Spring Break
3/21	Steady State Thermal Analysis
3/28	Transient Thermal Analysis
4/4	Introduction to ANSYS Mechanical
4/11	ANSYS Advanced Mechanical
4/25	ANSYS CFD, Assign Final Project
5/2	ANSYS Thermal CFD, Transient Problems
5/9	ANSYS-Fluent FSI, Rotating Machinery
Friday 5/20 12:00 to 1:50	Final Exam Period Presentation of Final Projects