Course and Instructor Information

Course Title: Applied Mechanics II
Credits: 3
Mode/Format: In person
Location: CAST 212
Time: Tuesday and Thursday 15:30-16:45
Prerequisites: CE 2110; MATH 2110Q or 2130Q.

Professor/Instructor/Facilitator: Chang Liu
Pronouns: he/him/his
Email: chang_liu@uconn.edu
Telephone: (410) 369-6999
Office Hours/Availability: Tuesday: 5-6 pm, Wednesday 4-5 pm, Location: EII 312

Co-Facilitator/Teaching Assistant: Bei Zhou
Email: bei.zhou@uconn.edu
Office Hours/Availability: Thursday noon -1pm, WebEx: https://uconn-cmr.webex.com/meet/bez17002

Course Materials

Required course materials should be obtained before the first day of class.

Required textbook:

Kasdin, N.J. and Paley, D.A., 2011. Engineering dynamics: a comprehensive introduction. Princeton University Press.

This textbook can be downloaded chapter by chapter freely after clicking the link "Log in through your library" on the top of the website https://www.jstor.org/stable/j.ctvcm4ggj Please also check the errata for this textbook in the link: https://cdcl.umd.edu/papers/kasdin-paley-errata.pdf

Required software: MATLAB. Please follow the instruction on https://software.uconn.edu/software/matlab/ to install.

Course Description

Course Description from Course Catalog: Fundamentals of dynamics using vector methods. Rectilinear and curvilinear motion, translation, rotation, plane motion; work, energy and power; impulse and momentum.

Course Objectives

Learn how to establish equations of motion for a particle and rigid body in two dimensions and three dimensions. Learn how to solve the equations of motion both analytically and numerically. Learn how to employ conservation laws to solve dynamics problems.

Course Requirements and Grading

Summary of Course Grading:

Course Components	Weight
In-class quiz	10%
Homework	30%
Midterm exam	30%
Final exam	30%

In-class quiz (10%)
In-class quiz will happen without prior notification and will be graded based on completeness.

Homework (30%)
One homework with the lowest grade will be automatically dropped and the grade will be averaged based on other homework. Homework will be due on Thursday and will be handed in through HuskyCT.

Midterm exam (30%)
Written exam allowing one page (both front and back, letter size) cheat sheet. Closed book and no internet. The tentative date is February 29th Thursday, during the class.

Final exam (30%)
Written exam allowing one page (both front and back, letter size) cheat sheet. Closed book and no internet. Date to be scheduled by the university.

Optional Oral Exam (30%)
This optional oral exam can be used to replace one of the exams with the lowest grade you have taken. This optional oral exam can be used to make up for the midterm or final due to illness or just an attempt to improve your grade. Scheduled by appointment.

Grading Scale:

Grade	Letter Grade	GPA
93-100	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0.0

Due Dates and Late Policy: Please contact me if you need an extension on homework and I will try to accommodate your request but usually I will extend the due date for everyone. If you do not contact me in advance, expect your grade to be lowered due to lateness (reduced by 25%). HW submission one week after the due date will not be graded.

Weekly Time Commitment: 6 hours outside of the classroom.

Course Outline

The tentative outline of the class is below, and they are subject to change based on the progress.

Dates	Sections in the textbook	Course content
Jan 16 and Jan 18	Chapter 1 and Sections 2.1-2.3	Introduction and Newton's law; Free-body diagram
Jan 23 and Jan 25	Sections 2.4 and 2.6	Constraints and degrees of freedom Solving equation of motions
Jan 30 and Feb 1	Sections 3.2 and 3.3	Vectors and reference frames Velocity and acceleration in the inertial frame
Feb 6 and Feb 8	Sections 3.4 and 3.5	Inertial velocity and acceleration in a rotating frame The polar frame and fictional forces
Feb 13 and Feb 15	Section 3.7	Solving a dynamics problem numerically
Feb 20 and Feb 22	Chapter 4	Linear and angular momentum of a particle
Feb 27 and Feb 29	Midterm covers chapters 1-3	Chapter 4 and midterm
Mar 5 and Mar 7	Chapter 5	Energy of a particle
Mar 12 and Mar 14	Spring break	Spring break
Mar 19 and Mar 21	Chapter 8	Relative motion in a rotating frame
Mar 26 and Mar 28	Sections 9.1-9.3	Center of mass, moment of inertia
April 02 and April 04	Sections 9.4-9.6	Parallel axis theorem; Work and energy
April 09 and April 11	Sections 11.1-11.2, and 11.7	Rigid body dynamics in three dimensions
April 16 and April 18	Sections 12.1-12.2	Linearization and stability, TBD
April 23 and April 25	Section 13.3	Lagrange's method, TBD (optional in exam)

Calendar and/or Class Meeting Schedule

The class meets every Tuesday and Thursday 15:30 - 16:45 at CAST 212 between 2024/01/16 - 2024/04/26. There is no class during Spring Recess between Sun, Mar 10-Sat, Mar 16.

Accommodations for Illness or Extended Absences

The homework will automatically drop the one with the lowest grade. The optional oral exam can be used to make up for the midterm or final due to illness or just an attempt to improve the grade. Please contact me if you need other accommodation and it will be evaluated case by case.

How to Succeed in this Course

All students can succeed in this course and we are here to help you along the way. Please do not hesitate to ask questions or attend office hours. All questions are important here. Success in this course program depends heavily on your personal health and well-being. Recognize that stress is an expected part of the college experience, and it often can be compounded by unexpected setbacks or life changes outside the classroom. Your teaching assistants and I strongly encourage you to reframe challenges as an unavoidable pathway to success. Reflect on your role in taking care of yourself throughout the semester, before the demands of exams and projects reach their peak. Please feel free to reach out to me about any difficulty you may be having that may impact your performance in your courses or campus life as soon as it occurs and before it becomes too overwhelming. In addition to your academic advisor, I strongly encourage you to contact the many other support services on campus that stand ready to assist you.

Academic Integrity

Cheating of any kind on examinations and/or plagiarism of homework is strictly prohibited. Students may work together on homework but submitted work should be your own. Any student work that is found to be in violation of the university policy regarding academic misconduct will be assigned a grade of zero. Read and understand The UConn Student Code of Conduct [Academic, Scholarly, and Professional Integrity and Misconduct Policy.](.).

Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The University believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The University aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the **Student Health and Wellness-Mental Health** (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the **Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor,** or contact the office at **(860) 486-4705, or https://studenthealth.uconn.edu/** for services or questions**.**