



INSTRUCTOR: NJ Getson	EMAIL: nigetson@uca.edu	PHONE: 501.450.5910
OFFICE HOURS: LSC 014	DAYS: Monday/Wednesday	TIME: 9:00–10:00 AM
OFFICE HOURS: Online	DAYS: Friday via Zoom	TIME: 11:00–12:00 PM
LECTURE: CCCS 105	DAYS: Mon/Wed/Fri	TIME: 8:00–8:50 AM
TEXTBOOK: <i>Engineering Mechanics: Dynamics</i> (Hibbeler, 15 th ed ISBN: 978-0134814988)		
SUPPLIES: Reliable internet connectivity, access to Blackboard, scientific calculator		

ENGR 3311: Dynamics

Spring 2023

OBJECTIVES

There are many purposes for an engineering dynamics class, most of which are about increasing the depth of our understanding of Newtonian mechanics:

- **Kinematics vs kinetics:** If you think it's tomato/tomahto, then you may be in for a surprise. *Surprise!*
- **Newton #2:** You are already quite familiar with Newton's Second Law. You will be refreshing your skills by constructing free body diagrams and setting up familiar two-dimensional problems. Then you will be expanding your focus from particles to rigid bodies, from 2-d to 3-d situations, and to alternate coordinate systems/frames of reference.
- **Work–Energy Theorem:** What do you get when you combine your kinematics with kinetics? That's right. Work and energy. Again, we will take our existing understanding and expand it to include both particles and rigid bodies, and both 2- and 3-dimensional problems.
- **Impulse–Momentum:** What's more fun than solving Newton #2 problems? Rewriting N#2 and combining it with N#3 so that we can crash things into other things. In three dimensions. While they spin.
- **Free and Forced Vibrations:** Because oscillating systems are not just relevant to Newtonian mechanics. Ask any acoustic or electrical engineer.

COURSE MATERIALS

There is triple redundancy for accessing course materials: Blackboard, the course web, and a shared google drive. The course web is convenient because it does not require a log-in (or go down for maintenance exactly when you need it most). You will be emailed the link for the shared drive.

LECTURE

All students are expected to comply with the official UCA policy regarding face coverings:

<https://uca.edu/coronavirus/students/>

Things are different this semester, so please be sure to read carefully. Surprise! You will be earning points for attending and participating in lecture.

Plan to attend every lecture. Like last semester, you will be actively engaged in solving problems. This semester, you will also receive point for attendance: ten points per lecture, with a maximum of 30 lectures for credit (300 points, or 30%).

QUIZZES

There will be quizzes due every Tuesday and Friday. Twenty-five quizzes are scheduled, and twenty will count towards your grade. Quizzes are worth 20 points each, for 20% of your course grade.

No late quizzes will be accepted. All quizzes must be submitted via Blackboard, and the Assignment will disappear after the deadline. If you miss a deadline for any reason, Quizzes 21–25 should be used as make-ups.

Quizzes will follow the same ENGR 2311 format. Rather than solving a problem for me, I will be giving you an incorrectly solved problem. Your job will be to locate, identify, and correct the errors.

EXAMS

There will be five exams this semester. Each test will cover two chapters, and you will solve two problems from each chapter. Tests will go live at 8:00 AM two days before the exam is due. On the due date, your exam must be submitted no later than 6:00 PM. Check the course calendars for specific dates.

Exams are open-resource. However, it goes without saying (but I'm saying it anyway) that the publisher's Solution Manual is not an acceptable resource. Asking the 'experts' at Chegg or CourseHero is a risky proposition; I advise against it. Use the textbook (May I strongly suggest the example problems?), the problems worked in class, the sample problems in the Online Classroom, and the relevant Quizzes.

Submit exams like portfolios. You should download the test paper, which will be provided as a .pdf document. Once you have the test, you can choose how to proceed. You can print it out and work on paper, or edit the .pdf directly on your preferred device. Once you are satisfied with your responses, convert your test to a .pdf document. You should upload your completed test using the appropriate BBoard assignment. Notice that this is just an Assignment, not a Portfolio. You will be able to upload multiple documents as necessary.

THE TEMPTATION TO CUT CORNERS

Transcribing exam problems from the Solution Manual is a clear violation of UCA's Academic Integrity Policy. And yet, you might be tempted to do it. You're running out of time, you're frustrated, your other classes are getting really hard...the rationalizations will seem perfectly reasonable to you, and it might seem like no big deal.

It's a big deal. And you don't need a sanctimonious lecture from me telling you so. You know it's not honest. But here are a few things you might not know: the Solution Manual for this textbook has errors in it (there's no solution manual that doesn't). When you blindly copy the error, you are tipping your hand. The manual is also written by a person (or several people). Those people (typically grad students) will have their own quirks of style, and their style is not your style. How do I know? Because you are copying style conventions that are not taught in any American school, but which are standard in other parts of the world. And the person writing the manual may or may not even be using the relevant method demonstrated in the book, so there's that.

Asking the Chegg or Course Hero 'experts' is also a violation of UCA's Academic Integrity Policy. It's also an amateur move. You will either get a scan of the page from the solution manual (see above), or you will get 'expert' help from an international student who will use all those aforementioned style quirks that you might not recognize, but I will.

Simply solve the problems yourself. When you need help, please ask. You will always be able to ask questions anonymously on the Blackboard discussion threads. Problems which have been transcribed from the Solution Manual will receive zero points. Or worse, depending on how pervasive the problem is. See the Academic Integrity section.

Problems which may not be completely numerically correct, but which are also clearly your own original work, will always be worth more points. Always.

POINTS AND GRADES

Scores will be reported using Blackboard, but you should keep track of your point progress over the semester. Points may be earned in the following ways:

PARTICIPATION	30 lectures @ 10 points each	300 points
QUIZZES	20 quizzes @ 20 points each	400 points
EXAMS	5 exams @ 60 pts each	300 points
TOTAL POINTS		1000 points

Grades will be assigned using the following scale:

GRADE	A	B	C	D	F
POINTS	890–1000	790–889	690–789	600–689	0–599

You have enormous control over your grade; 70% of your grade should be at or near perfect. You have already been attending class regularly, so keep doing what you have already been doing. You also have plenty of quiz experience now, and ought to be able to spot and correct errors quickly!

ACADEMIC INTEGRITY

The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy.

It is also a matter of academic and personal integrity to take responsibility for withdrawing yourself from this course, if the situation requires it. The last day for unrestricted withdrawal with a W is 04/10/23. Only W grades may be assigned through the 12th week of the semester. After this date, only grades of A, B, C, D, or F will be allowed.

STUDENT EVALUATIONS

Student evaluations of a course and its professor are a crucial element in helping faculty achieve excellence in the classroom and the institution in demonstrating that students are gaining knowledge. Students may evaluate courses they are taking starting on the Monday of the twelfth week of instruction (04/10/23) through the end of finals week by logging in to [myUCA](https://myUCA.edu) and clicking on the Evals button on the top right.

AMERICANS WITH DISABILITIES ACT

UCA adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this Act due to a disability, please contact the [Office of Accessibility Resources and Services](https://myUCA.edu) (OARS), 450-3613.

TITLE IX DISCLOSURE

If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on those specific set of circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <http://uca.edu/titleix>.

**Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.*

BUILDING EMERGENCY PLAN

An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS and Building Emergency Plan (BEP) documents for most buildings on campus are available at <https://uca.edu/go/bep-library>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

DISCLAIMER

Assignments, point distributions, grading scales, and course policies should be regarded as flexible and subject to substitution or change at the discretion of the instructor. Students should refer to the 2022–23 Student Handbook and familiarize themselves with all policies, particularly the Sexual Harassment Policy and Academic Policies.

Lastly, I reserve the right to implement any reasonable course restructuring made necessary by circumstances beyond my control. When aliens land on the moon, one way or another, we're still going to have class.

Tentative Course Calendar

WEEK	MONDAY	TUESDAY	WEDNESDAY	FRIDAY
JAN 09–13				Syllabus, Course Policies
JAN 16–20	MLK Day! No Class!		Chapter 12.1–12.3: <i>Rectilinear Motion</i>	Chapter 12.4–12.6: <i>Projectile Motion</i>
JAN 23–27	Chapter 12.7–12.8: <i>Curvilinear Motion</i>	DUE: Quiz 01: Chapter 12	Chapter 12.8–12.9: <i>Dependent Motion</i>	Chapter 12.10: <i>Relative Motion</i> DUE: Quiz 02: Chapter 12
JAN 30 – FEB 03	Chapter 13.1–13.3: <i>Equations of Motion</i>	DUE: Quiz 03: Chapter 12	Chapter 13.4–13.5: <i>Normal & Tangential Coordinates</i>	Chapter 13.6–13.7: <i>Cylindrical Coordinates</i> DUE: Quiz 04: Chapter 13
FEB 06–10	Chapter 13.6–13.7: <i>Cylindrical Coordinates</i> Exam 01: Live at 8:00 AM	DUE: Quiz 05: Chapter 13	Chapter 14.1–14.2: <i>Work and Energy</i> DUE: Exam 01 (Ch 12–13)	Chapter 14.3–14.4: <i>Power and Efficiency</i> DUE: Quiz 06: Chapter 14
FEB 13–17	Chapter 14.5–14.6: <i>Conservation of Energy</i>	DUE: Quiz 07: Chapter 14	Chapter 15.1–15.3: <i>Linear Impulse & Momentum</i>	Chapter 15.4–15.5: <i>Impact</i> DUE: Quiz 08: Chapter 14
FEB 20–24	Chapter 15.6–15.7: <i>Angular Impulse & Momentum</i>	DUE: Quiz 09: Chapter 15	Chapter 15.8–15.9: <i>Fluids & Variable Mass</i>	Chapter 16.1–16.2: <i>Translation</i> DUE: Quiz 10: Chapter 15
FEB 27 – MAR 03	Chapter 16.3–16.4: <i>Fixed-Axis Rotation</i> DUE: Exam 02 (Ch 14–15)	DUE: Quiz 11: Chapter 16	Chapter 16.5–6.6: <i>Instantaneous Center of Zero Velocity</i>	Chapter 16.7–16.8: <i>Relative Motion Using Rotating Axes</i> DUE: Quiz 12: Chapter 16
MAR 06–10	Chapter 17.1–17.2: <i>Mass Moment of Inertia</i>	DUE: Quiz 13: Chapter 17	Chapter 17.3–17.4: <i>Translation and Rotation</i>	Chapter 17.4–17.5: <i>General Plane Motion</i> DUE: Quiz 14: Chapter 17
MAR 13–17	Chapter 18.1–18.2: <i>Kinetic Energy</i> Exam 03: Live at 8:00 AM	DUE: Quiz 15: Chapter 18	Chapter 18.2–18.3: <i>Kinetic Energy</i> DUE: Exam 03 (Ch 16–17)	Chapter 18.3–18.4: <i>Work of a Couple Moment</i> DUE: Quiz 16: Chapter 18
MAR 20–24	Spring Break! No Class!	Spring Break! No Class!	Spring Break! No Class!	Spring Break! No Class!
MAR 27–31	Chapter 18.4–18.5: <i>Conservation of Energy</i>	DUE: Quiz 17: Chapter 18	Chapter 19.1–19.2: <i>Impulse and Momentum</i>	Chapter 19.2–19.3: <i>Conservation of Momentum</i> DUE: Quiz 18: Chapter 19
APR 03–07	Chapter 19.3–19.4: <i>Eccentric Impact</i> Exam 04: Live at 8:00 AM	DUE: Quiz 19: Chapter 19	Chapter 20.1: <i>Rotation About a Fixed Point</i> DUE: Exam 04 (Ch 18–19)	Chapter 20.2: <i>General Motion</i> DUE: Quiz 20: Chapter 20
APR 10–14	Chapter 20.3: <i>Translating and Rotating Axes</i>	DUE: Quiz 21: Chapter 20	Chapter 20.4: <i>Translating and Rotating Axes</i>	Chapter 21.1–21.2: <i>Angular Momentum</i> DUE: Quiz 22: Chapter 21
APR 17–21	Chapter 21.3–21.4: <i>Kinetic Energy</i>	DUE: Quiz 23: Chapter 21	Chapter 21.5–21.6: <i>Gyroscopic Motion</i>	Chapter 22.1–22.2: <i>Undamped Free Vibrations</i> DUE: Quiz 24: Chapter 22
APR 24–28	Chapter 22.2–22.3: <i>Undamped Forced Vibrations</i> Exam 05: Live at 8:00 AM	DUE: Quiz 25: Chapter 22	DUE: Exam 05 (Ch 20–22)	Study Day! No Class!