



Department/College: Physics and Astronomy/College of Science
Course Title: PHYS 1220: Physics with Calculus I
Semester: Spring 2022
Class Location: Daniel Hall 100B
Course start date: January 12, 2022
Course end date: May 6, 2022
Class Meetings: MWF 8:00–8:50 (sect 001), 9:05-9:55 (sect 002), 10:10-11:00 (sect 003)
Course CRN: 10457 (sect 001), 10478 (sect 002), 10480 (sect 003)
Instructor: Lih-Sin Thé, Ph.D.
University Email: tlihsin@clemson.edu
Office Hours: MWF: 1:00 – 4:30 pm TTh: 10:00 am – 4:00 pm
Office Location: Kinard Hall, 120-D
Office Phone: (864) 656 – 1644

Course Description

First of three courses in a calculus-based physics sequence. Topics include vectors, laws of motion, conservation principles, rotational motion, oscillations, and gravitation. Credit for a degree will be given for only one of PHYS 1220, 2000, or 2070. Includes Honors sections.

Due to the fast spread of the Omicron COVID variant, we will have our first two class sessions online through the zoom link shown on the front page of our Canvas course. We will have our first in-person class on Wednesday, January 19th in 100B Daniel.

Our class is an in-person class. In case you need to isolate/quarantine, you must submit a Notification of Absence and should attend our class online through zoom. After January 17th, attending our class through zoom is only for students who need to isolate/quarantine; other case is not allowed (no quiz score is given). If the fraction of the number of online

accommodation (students that need to isolate/quarantine) exceeds 20%, then the course will shift to fully online until the rate drops. All our lectures will be recorded and will be made available in Canvas.

Prerequisites

Prerequisite or concurrent enrollment: MATH 1060 or MATH 1070

Value Statement

In this course students will learn and understand physics that they see every day that is motion of objects and how forces interact with objects. Completing the course assignments, students will improve their problem solving skills and strengthen their quantitative reasoning which are essential for their academic career and future jobs.

Course Objectives

To give the successful student a working knowledge of mechanics and the skills necessary to solve basic mechanics problems with exercises in critical thinking using quantitative and qualitative analysis. Students are expected to have the skills to:

- Analyze motion in terms of position, displacement, velocity, and acceleration.
- Develop the skill to apply one- and two-dimensional kinematic equations.
- Construct free-body diagrams and apply Newton's laws of motion.
- Apply Newton's laws and kinematic equations to rotational motion.
- Analyze systems using conservation laws of energy and momentum.
- Compute the properties of rigid body motion (translation and rotation).
- Apply Newton's laws and conservation laws to fluids and oscillations.

Gen Ed Requirements

This course satisfies the general education competency for mathematics and natural sciences with the lab as evident in the lab reports of PHYS1240. Students will demonstrate the process of scientific reasoning through experimental activity and critical comparison of their results to those predicted by accepted natural science principles. Students will also demonstrate the ability to assemble information relevant to a significant, complex issue, evaluate the quality and utility of the information, and use the outcome of the analysis to reach a logical conclusion about the issue.

Required Materials

- **Textbook:** *Physics for Scientists and Engineers: Foundation and Connections* (Clemson or Advance edition) by Debora M. Katz. (2015), Boston, MA 02210: Cengage. ISBN: #978-1-305-30882-4, 978-0-534-46684-8, 978-1-305-25983-6, 978-1-305-07798-0, or 978-1-337-59229.

The materials recommended for this course are included in [Cengage Unlimited](#), a subscription that gives you access to all your Cengage access codes and online textbooks for \$119.99 per term (EBK Cengage Unlimited Subscription ISBN #978-0-357-70000-6),

\$179.99 per year, or \$239.99 for 2 years. No matter how many Cengage products you use, they are included in Cengage Unlimited and the price stays the same. You can purchase access to Cengage Unlimited in the bookstore, or at www.cengage.com.

- For additional support, please visit:
- Getting started materials: www.cengage.com/start-strong
- Training site for Cengage platforms: www.cengage.com/training
- FAQs: <https://www.cengage.com/faq>
- Cengage Customer Support: cengage.com/support or 1-800-354-9706

If you would like to get an ebook, the kindle version of the textbook is available in amazon.com.

We also put a free “University Physics” and “College Physics” textbooks from Openstax in pdf files in our Canvas. These are also good textbooks for our class as they contain almost exactly the same materials as the official textbook by Debora Katz above.

- **For Online Homework Assignments:** The WebAssign account (accessed through canvas, see “Log in to WebAssign” below).
- **For In-Class Assignments/Quiz:** an internet device such as a laptop, tablet, or cell phone with subscription/access to iClicker Cloud audience response system.
- Ancillary information (lecture notes, recorded lectures, equation sheets, etc.) is provided in the Canvas course site and through Internet links (under the “Files” and “Modules” sections of Canvas).
- Laptop or desktop computer.
- Reliable internet service.
- Web browser either [firefox](#), [chrome](#), or safari.
- [Adobe Reader](#), Java, QuickTime Player.

Student Learning Outcomes

- Students will identify velocity and acceleration from the position-versus-time graph and velocity-versus-time graph.
- Students can utilize kinematic equations to determine the position, velocity, and acceleration of a moving object.
- Students can calculate the net force on an object and can apply the three Newton laws to determine the motion of an object.
- Students can apply kinematic equations of circular motion in combination with Newton’s second law for a circular motion to determine the motion of an object in a circular motion.
- Students can correctly apply the law of conservation of momentum.
- Students can utilize the law of conservation of energy for isolated and non-isolated systems.
- Students can apply Newton’s laws and conservation laws to fluids and oscillations.

In-Class Quiz

We are using audience response systems in the class called iClicker Cloud Polling for our daily in-class quiz. Each class, there will be several questions posed throughout the class to which you will respond with your internet device. Your iClicker Cloud account must be activated and

registered as soon as possible. We will begin using iClicker Cloud for our first-in-class quiz on January 19th (Wednesday).

Creating Your iClicker Cloud Account:

- Download the iClicker Cloud mobile app via the App Store or Google Play or visit iClicker.com and then click **Sign Up!**
- During the registration, you **enter your CU's email address (.....@clemsn.edu) as your username**. You also need to enter **your student ID**; note that a Clemson student ID **starts with an uppercase C followed by 8 numeric characters** (for example, C12345678).
- Select "Clemson University" as your institution. Follow the sign-in instructions. You should then click the plus sign in the upper right-hand corner to select this course.

Purchasing iClicker Cloud subscription: Students can purchase an iClicker Cloud subscription from within the iOS or Android applications. All students receive a free 14-day trial when they sign up for an iClicker Cloud account. A 6-month (- year) subscription costs \$14.99 (\$23.99).

Concerning scoring, you will receive 3 raw points for every answer (regardless of the correctness) and five raw points for each correct answer (zero points are recorded for no answer/an absence). Your grade for this portion of the class is 10% of the total score in the class. *The lowest three daily quiz scores (including zeroes) will be dropped near the end of the semester.* Each quiz day score is worth the same amount of credit regardless of the number of questions asked on that day.

iClicker Cloud (in-class quiz) makeup: If you miss more than three class days due to university excused absences or illnesses documented by a physician, you will have an opportunity to make up iClicker points. To take advantage of this, you must email your instructor pdfs of your excuses. Your instructor will then give you an assignment for each day (or exemption) over the three that you miss to make up the points. The student will only be allowed a make-up if he/she shows written documentation within one week of a particular iClicker session.

Technical Support: In case of a technical problem, students should contact ithelp@clemsn.edu, or call (864)656-3494. For additional or after-hours support, students and faculty can call (866)209-5698 TOLLFREE Monday-Thursday 9am-11pm ET and Friday 9am-9pm ET. You can also send an email to REEF Support at support.iclicker.com anytime.

Homework

We will be using **WebAssign** as our interactive homework submission system. Homework must be submitted for each chapter in the textbook. Homework sets are posted on the WebAssign.net website. Every student will have a free access to WebAssign in the first two weeks of class. If you purchase a new textbook, you will receive a student access kit to

WebAssign packaged with it. Students who do not purchase a textbook can purchase the online access using a credit card during the registration process. The Student Access Kit that comes with the textbook consists of a card with printed online registration instructions and a pull-tab revealing a student access code. Each code can be used by only one student.

Homework is intended to take you between 2 and 3 hours per chapter. For each problem, students are given 6 trial submissions to a correct answer. The worth of homework total points is 20% of the total points in class. Homework is due at 11:59 pm on the day indicated in the schedule. There is a 20% score reduction for late homework by requesting an automatic extension in WebAssign (the reduction will only be applied to problems submitted late). Automatic extension requests can be made up to 3 days after the due date with a window of 3 days to complete late problems. Each homework is worth the same amount of credit (regardless of the number of raw homework points). The lowest homework score will be dropped at the end of the semester.

Log in to WebAssign

All students will have two week grace period from the start date of the course to use WebAssign for free, after that period students have to pay for the access. To access your WebAssign account directly from Canvas, do the following steps:

- Log in to Canvas and click **Assignments**, then click “Getting Started with WebAssign – Tutorial” under **WebAssign Assignments**. This steps will log you in your WebAssign account.
 - If this is the first time you access WebAssign from Canvas, link your WebAssign account by entering your WebAssign username and password, then click **Link Account**.
 - If you do not have a WebAssign account, click “I don’t have a WebAssign account” to create your WebAssign account.
- After that, you may select "enter an access code" to enter your access code.

Examinations

Midterm Exams: There will be three exams during the course schedule. Each exam lasts one hour and is worth 150 points. Each exam will be taken through the Canvas online system proctored by the Respondus Monitor. The exam can be taken at any location that students think is quiet and no disturbance. It will be given on **Thursday at 7 pm** on *February 10th*, *March 17th*, and *April 21th*. Each exam is a multiple-choice exam where some problems are given partial credits. There will be practice exams in Canvas for students to practice before the exam and to make sure student computers work with the system. If you miss an exam because of an excused absence, you will be given a makeup exam. To obtain an excused absence from a test your reason must be serious and verified by university sources. *Makeup exams will be given the following Thursday at 7 pm* online through Canvas. **There are no dropped exams, exam grade replacements, or final exam exemptions.**

Final Exam:

The final exam is comprehensive that it covers all materials of the course. It will be given on **Wednesday, May 4th from 7:00 pm to 9:30 pm**. It will be a multiple-choice Canvas online exam like the other exam to be proctored by the Respondus Monitor and to be taken at any location the student thinks is quiet and no one will disturb him/her during the exam. **No exemptions from this examination will be given.** The final examination will be worth 250 points or 25% of your final grade.

Exam Aids:

During all of the exams, students are allowed to bring and to use the equation sheet, Phys1220_Eqs.pdf that is available in the “Files” of our Canvas. This equation sheet can have no writing on it. You will also be allowed to bring in several blank scratch papers. You will need to bring your computer to your assigned testing room. Please make sure your computer is fully charged before entering the room as there may not be enough outlets for all. **Note that Calculators are not allowed.**

Grading

Assignments in this course are divided into these general categories, which carry the following weight in your final grade calculations:

3 Midterm exam	450 points
Final exam	250 points
Assignments	200 points
Quiz	100 points
Total points	1000 points

You are treated as a professional in the course. Accordingly, the grading is strict but fair. Reading the directions and grading criteria provided for each assignment is the key to understanding how you will be graded. Following those directions is the key to doing well.

This course follows the typical grading guidelines:

- A = 90 to 100%
- B = 80 to 89%
- C = 70 to 79%
- D = 60 to 69%
- F = 0 to 59%

Contesting Grades

Grades will be updated typically daily on Canvas. You have one week to contest any grade after it is posted. Homework grades will be posted in WebAssign.net and any contesting of grades should be done within a week of completion of the assignment. Any requests for reexamination of scores more than one week after the grades are posted will not be granted. Quiz scores are typically posted daily so there should be plenty of time to contest a score within the allotted

week. Requests for quiz make-ups must also be made within the week of the question and must be backed up by a written document validating the conflict.

Attendance Policy

Attendance is required. Because of the pace at which material is covered and because of the cumulative nature of the principals involved it is recommended that students not miss a class unless there is a compelling reason. Students are requested to wait 10 minutes in the unlikely event that your instructor is late for class.

For an absence to be considered an excused absence, a student must use the Notification of Absences form in Canvas or directly communicate with the instructor. A student with an excessive number of absences may be withdrawn at the discretion of the course instructor.

In the event of a regional or national emergency (e.g., pandemic, hurricane, etc.), students missing classes may not be charged with unexcused absences if the nature and extent of the emergency are defined and disseminated by the provost (or designee).

Any exam that was scheduled at the time of a class cancellation due to inclement weather, University power outage etc. will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless the instructor contacts students. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

Make-up Work Due to Missed Attendance:

- Students should speak with their course instructors regarding any scheduled absence as soon as possible and develop a plan for any make-up work.
- In the event of an emergency, the student should make direct contact with the course instructor, preferably before a class or an exam takes place. It is the student's responsibility to secure documentation of emergencies if required.
- While course instructors should seek to make reasonable accommodation for a student involved in university-sponsored activities, students should understand that not every course can accommodate absences and that absences do not lessen the need to meet all course objectives.

Notification of Absence:

- The Notification of Absence module in Canvas allows students to quickly notify instructors (via an email) of an absence from class and provides for the following categories: court attendance, death of a family member, illness (or COVID-19 related isolation), illness of family member, injury, military duty, religious observance, scheduled surgery, university function, unscheduled hospitalization, other anticipated absence, or other unanticipated absence. The notification form requires a brief explanation, dates, and times. Based on the

dates and times indicated, instructors are automatically selected, but students may decide which instructors will receive the notification. This does not serve as an “excuse” from class, and students are encouraged to discuss the absence with their instructors.

- If a student is unable to report the absence electronically, he/she may call the Office of Advocacy and Success at 656-0935 for assistance and guidance. The Office of Advocacy and Success also assists students in identifying various appropriate methods of documenting absences and assists families in using the electronic Notification of Absence system when students are unable to do so themselves.

Class Roll:

Students can use iROAR to add courses through January 19, to drop courses without record through January 26, and to drop with a W grade through March 18, 2022. Students that have not participated in in-class activities by the second week, after the last day to add a class, will be removed from the roll. For students in a course where Canvas is used, instructors can view students’ date of last activity and total activity under the “People” tab. A student with an excessive number of absences may be withdrawn at the discretion of the course instructor. For the Spring 2022 semester, “excessive absences” will apply to students that never engage in-class activity (in-person and/or online), to keep the class roll accurate. Students will not be penalized for absences related to COVID-19 (e.g., illness, isolation, quarantine).

COVID-19 Related Expectations for Face Coverings:

While on campus, face coverings are recommended in all buildings and classrooms. Face coverings are also recommended in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website, such as the use of wipes for in-person classes.

Classroom Usage and Cleaning Protocol:

Specific COVID-19 related information for in-person classes.

Before coming to campus or leaving a residence hall to go to class, all instructors and students should complete the COVID-19 Self-Assessment Tool. To create a culture of health and safety, faculty are encouraged to address their specific classroom on the first day of class. Once the instructor from the previous class leaves the classroom, or the room is empty, the instructor may enter and use a disinfecting wipe to clean their instructional area (podium/table and all equipment). When ready, the instructor will let students into the classroom. Instructors should remind students to take only one wipe and to only take a wipe if they need one. To maintain physical distancing, individuals arriving first to the classroom should occupy the furthest space. For example, for classrooms with rear entry, the space should fill from the front to the back, and individuals at the back of the space should exit first. For other spaces, faculty should provide students with direction on how to fill the classroom to maintain distance as much as possible. At the end of class, instructors should again wipe down their instructional area and discard their own disinfecting wipes in the labeled trash receptacles. Any classroom issues should be reported before leaving to the Building Security Coordinator, CCIT (contact information provided at instructor desk/podium), and/or Facilities (656-2186).

Response to a Presumptive Positive or Positive COVID-19 Test: Instructors and students who are informed that they have a presumptive positive diagnosis or have tested positive for COVID-19 should immediately self-isolate and submit the COVID-19 Positive Test Reporting Form (under development, see University COVID-19 webpage).

Academic Grievances

Academic grievances are handled by [Dr. Jeffrey Appling](#) in Undergraduate Studies. Students are advised to visit the [Ombuds Office](#) before filing a grievance. After a discussion with the undergraduate academic ombudsman, students should contact Undergraduate Studies (656-3022) for assistance filing official paperwork.

Technical Support: If you are experiencing technical difficulties with any element of the course, please contact me immediately. I will direct you to the appropriate IT support (for course site issue email ithelp@clemson.edu and for WebAssign site issue go to <http://webassign.com/support-request> or call (800) 955-8275) to fix the issue promptly.

Faculty Response Time

Communications Response Time: Instructor response time is 36 hours for questions posted in the Learning Management System and sent via email. This response times exclude weekends, official University closures, and other times as noted by the instructor. Should you need live assistance, email me to arrange an office or phone consultation.

Faculty Grading Expectations: Most assignments will be graded within 72-hours. Some assignments may be graded by Canvas and will be available for review after the due date of the assignment. Larger assignments may take up to one week to be graded. Late work will be graded within one week of submission.

Important Note: Refer to the course calendar for specific meeting dates and times. Activity and assignment details will be explained in detail within each week's corresponding learning Chapter. If you have any questions, please contact your instructor.

Receiving Grades & Instructor Feedback

Assignment grades and feedback are provided generally **48 hours** after the assignment is due and always before an assignment of the same type is due. Unless otherwise stated, grades and feedback will be available via the **Grades** area of the course site.

Tutoring Information

This course is supported by the Academic Success Center tutoring program. The ASC tutors have completed and done well in this course, and they understand the concepts well enough to help you work through the questions you have. The ASC tutoring program is certified by the College Reading and Learning Association, which means that our tutors are trained to share learning and study strategies during tutorial sessions. While tutors will not complete/correct homework for you or help you with take-home tests or quizzes, they will help you understand and reinforce

concepts that you are learning in your classes. For more information visit <https://www.clemson.edu/asc/courses/tutoring/index.html>.

Additional Course Support

If you discover that you would like additional support to meet your success goals for this course, contact the Academic Success Center using their “Request for Course Assistance” form (<http://www.clemson.edu/asc/courses/index.html>). Private tutoring may be available through the Tutor Matching Service. If you feel confident in your abilities in this course after completion, or in other courses you have already completed, please consider signing up to provide tutoring at a pay rate you set for yourself (<http://www.clemson.edu/asc/courses/private-tutoring.html>).

Course Calendar:

Phys 1220 Spring 2022 Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
January 10 No class	11	12 Intro/Ch 1	13	14 Ch 2
17 MLK Holiday	18 HW Getting St	19 Ch 2	20 HW #1 Due	21 Ch 2
27 Ch 2	25	26 Ch 3	27 HW #2 Due	28 Ch 3/4
31 Ch 4	February 1 HW #3 Due	2 Ch 4	3	4 Ch 4
7 Ch 5	8 HW #4 Due	9 Ch 5 & Review-1	10 Ch 1-4 Exam 1	11 Ch 5
14 Ch 5/6	15	16 Ch 6	17 HW #5 Due	18 Ch 6
21 Ch 6	22	23 Ch 7	24 HW #6 Due	25 Ch 7
28 Ch 8	March 1	2 Ch 8	3 HW #7 Due	4 Ch 8
7 Ch 9	8 HW #8 Due	9 Ch 9	10	11 Ch 9
14 Ch 10	15 HW #9 Due	16 Ch 10 & Review-2	17 Ch 5-9 Exam 2	18 Ch 10
21 Spring Break	22 Spring Break	23 Spring Break	24 Spring Break	25 Spring Break
28 Ch 11	29 HW #10 Due	30 Ch 11	31 HW #11 Due	April 1 Ch 12
4 Ch 12	5	6 Ch 12/13	7 HW #12 Due	8 Ch 13
11 Ch 13	12	13 Ch 13	14 HW #13 Due	15 Ch 13/14
18 Ch 14	19 HW #14 Due	20 Ch 15 & Review-3	21 Ch 10-14 Exam 3	22 Ch 15
25 Ch 15	26	27 Ch 15/16	28 HW #15 Due	29 Ch 16 & HW#16Due
May 2	3	4 Ch 1-16 Final Exam	5	6

January 19: Last day to register or add a class or declare audit.

January 26: Last day to drop/withdraw without a W.

March 18: Last day to drop a class/withdraw from the University without final grades.

Final Exam: Wednesday, May 4th from 7:00 pm until 9:30pm

Topical Outlines:

Instructional content is organized in Chapters grouped with corresponding assessments.

Chapter 1: *Getting Started with Physics:*

- Describe what physics is about and provide a guide on how to learn physics.
- Describe the general strategy to solve physics problems.
- Topics include Systems of Units and Unit Conversion, Scientific Notation, Dimensional Analysis and the rules of its applications, Error and Significant Figures, the rules in using significant figures, and Order-of-Magnitude Estimates.

Chapter 2: *One-Dimensional Motion*

- Describe 1-D motion using the concepts and equations of kinematics.
- Topics include motion diagrams, coordinate systems, position-versus-time graphs, displacement and distance traveled, average velocity and speed, instantaneous velocity, average and instantaneous acceleration, the kinematic equations of constant acceleration, and the free-fall gravity acceleration.

Chapter 3: *Vectors*

- Students learn to add vectors graphically and algebraically.
- Topics include adding vector graphically, vector subtraction, Cartesian coordinate system, resolving a vector into components and draw its graphical presentation, calculating the magnitude and direction of a vector, adding vectors algebraically, and applying the vector techniques to analyze displacement and velocity of two-dimensional motion.

Chapter 4: *Two-and Three-Dimensional Motion*

- Students learn to combine the kinematics concepts of Chapter 2 with the mathematical tools of Chapter 3 to study two- and three-dimensional motion.
- Topics include motion diagrams, position vector, displacement, velocity, acceleration, and kinematics equations of multidimensional motion, projectile motion, uniform circular motion, and relative motion in two dimensions.

Chapter 5: *Newton's Laws of Motion*

- The goal of this chapter is to develop a universal understanding of the relationship between forces and motion.
- Topics include Newton's first law, inertial mass, inertial reference frames, what a force is, Newton's second law, some specific forces, relating the positions, velocities, accelerations (kinematics) with forces (net force in Newton's 2nd law), free-body diagrams, and Newton's third law.

Chapter 6: Applications of Newton's Laws of Motion

- In this chapter, we will apply Newton's laws and kinematics to some practical situations.
- Topics include static, kinetic, and rolling friction, inclined plane problem, drag force, terminal speed, centripetal force, Newton's 2nd law for circular motion, and Nonuniform circular motion.

Chapter 7: Gravity

- The goal of this chapter is to study the nature of the gravitational force for objects small objects and for systems as massive as galaxies and show how the gravitational force affects the motion of the objects.
- Topics include the geocentric and heliocentric models of the solar system, the three Kepler's laws of planetary motion, Newton's law of universal gravity and the scientific process of its discovery, inertial and gravitational mass, gravitational field, and Newton's version of the third Kepler's law.

Chapter 8: Conservation of Energy

- This chapter introduces the principle of conservation of mechanical energy to solve problems involving conservative forces and forces that are perpendicular to the direction of motion.
- Topics include kinetic, potential, and mechanical energies, gravitational potential energy near the Earth, universal gravitational potential energy, elastic potential energy, conservation of mechanical energy, using the conservation of mechanical energy, energy diagrams, and orbital energies.

Chapter 9: Energy in NonIsolated Systems

- This chapter extends the application of the conservation of energy to account for energy transfer to and from nonisolated systems.
- Topics include work as energy transfer to and from the environment, work done by a constant force, work-kinetic energy theorem, dot product, work done by a nonconstant force, conservative and nonconservative forces, thermal energy, work-energy theorem, and power.

Chapter 10: Systems of Particles and Conservation of Momentum

- In this chapter, we develop the law of conservation of momentum.
- Topics include the momentum of a particle, the center of mass, the acceleration and the momentum of systems of particles, applications of the law of conservation of momentum to systems of particles including nuclear decay and rockets.

Chapter 11: Collisions

- In this chapter, we apply the law of conservation of momentum to collisions.

- Topics include the impulse-momentum theorem, conservation of momentum during a collision, one-dimensional inelastic collisions, one-dimensional elastic collisions, and two-dimensional collisions.

Chapter 12: *Rotation I: Kinematics and Dynamics*

- In this chapter, we explore rotational kinematics and rotational dynamics.
- Topics include rotational kinematics (angular position, angular displacement, angular velocity, angular acceleration), rotation of rigid bodies, rotational inertia, torque, cross product, and Newton's 2nd law for rigid body rotation.

Chapter 13: *Rotation II: A Conservation Approach*

- In this chapter, we learn how to apply the principles of conservation of energy and angular momentum to rotational motion.
- Topics include rotational inertia, rotational kinetic energy, rolling motion, work and power, angular momentum, and conservation of angular momentum.

Chapter 14: *Static Equilibrium, Elasticity, and Fracture*

- In this chapter, we look at the conditions for static equilibrium and study the properties and deformation of materials.
- Topics include static equilibrium conditions, stress, strain, Young's modulus, elasticity, fracture, elastic limit, tensile strength, shear modulus.

Chapter 15: *Fluids*

- In this chapter, we study the properties of fluids (liquids and gases) and how they interact with solid objects.
- Topics include static fluid, pressure, Archimedes' principle, Pascal's principle, manometer, barometer, ideal fluid flow, continuity equation, and Bernoulli's equation.

Chapter 16: *Oscillations*

- In this chapter, we describe the kinematics, dynamics, and energy of simple harmonic oscillators.
- Topics include the angular frequency, amplitude, phase of harmonic oscillators, kinematic equations of simple harmonic motion, connection of oscillation with circular motion, dynamics of simple harmonic motion, simple pendulum, physical pendulum, torsion pendulum, damped harmonic motion, driven oscillator, and resonance.

Course Navigation

The buttons in the course menu provide access to these content areas:

- **Announcements:** Includes updates and reminders for the course.

- **Syllabus:** Explains the course objectives, grading criteria, student responsibilities, and final exam information for proctoring.
- **Files:** Includes many additional study materials such as Lecture Notes, Recorded Lectures, Old Exam Solutions, and Equation Sheets.
- **Grades:** Displays instructor feedback and grades. If you see an exclamation mark for an assignment, it means the assignment has been submitted and will be reviewed by the instructor. If you see a score for an assignment, you can click on it to read feedback from your instructor.
- **Modules:** Includes video-recorded lectures.

Course Content

This course contains Chapters (or chapters), each consisting of some or all of the following components:

- **Textbook Reading:** In each chapter, you will read a chapter, or several chapters, from the textbook and/or other course materials made available to you in the course site.
- **Worked Examples:** In the lecture notes of each chapter, you will follow through work examples to enhance your understanding of applying the concepts to physics problems.
- **Recorded Lectures:** In most Chapters, recorded lectures are available to further clarify some topics discussed in the textbook with application to solve example problems and to show some demonstration to real-life examples.
- **Assignments and Exercises:** In most Chapters, you will complete an assignment or assessment related to the reading. These assignments and assessments will help in your understanding of the material in the assigned chapters and related readings. The assignments include homework at ExpertTA, midterm exams, and a final exam.
- **In-Class Quiz:** You will participate in in-class quizzes. We are using the iClicker Cloud audience response system in class.

Communicating with Your Instructor

You have *numerous* ways of communicating with your instructor: phone, email, the **Q&A** forum, and live consultations by appointment with the Adobe Connect Meeting system.

- If you have a question about an assignment or class procedure, consider posting it in the **Q&A** forum (accessed through the Discussion button in the left column of course Canvas) so that other members of the class can benefit from it, too. A lot of learning can happen in this forum if you use it, so please do!
- If you have a personal concern (such as a question about a grade), send a message to your instructor through the course site or your Clemson email account.
- I am here to help you, so please ask questions and seek clarification as early and as often as needed. Delay will only hinder your learning.

Minimum Technical Skill Requirements

Students are expected to have a minimum working knowledge of computers and a word processing program to be successful in a class. You must be comfortable with your computer system and willing to deal with any problems that may arise. Lack of technical knowledge can greatly interfere with your learning a new subject. If you do not have these skills, consider taking a short computer course before enrolling in a course.

- Get your password and login to your class before the semester begins (if available)
- Attach files to email messages
- Compose written documents in a Word processor such as [Microsoft Word](#)
- Word processing tasks (type, cut, paste, copy, name, save, rename, etc.)
- Download information from the Internet
- Use of a Web browser
- Completing online forms
- Backup your files
- Install and maintain anti-virus and other software

Students are expected to be comfortable accessing the course site and downloading files such as Microsoft Office documents, YouTube videos, and PDFs. Besides, students should be able to use Microsoft Office to compose written documents.

For technical assistance with the course site, students should contact ithelp@clemson.edu or visit CCIT's website: http://www.clemson.edu/ccit/help_support/.

Submitting Work

Make sure you submit coursework according to the directions provided in the course. Here are general guidelines for assignment submission:

- **Submit homework assignments in WebAssign before the deadlines.**
- **Complete the midterm exam**
- **Complete the final exam**
- **Do not email coursework unless you have received prior approval from your instructor.**

Meeting Deadlines

Assignments are due by **11:55 pm, Eastern Time** on the day specified unless otherwise stated. Plan for the unexpected! You are accountable for staying on the schedule should technological or other problems arise. You should immediately contact the instructor if an emergency may affect your ability to meet course deadlines.

Many students juggle school, work, family, and other life responsibilities all at the same time. If a serious life issue prevents you from staying current in your coursework, contact your instructor as soon as possible to explain your circumstances. Do not let school or life responsibilities overwhelm you. The faculty and staff at Clemson are aware that students face challenges, and we are committed to your success. Often, we may be able to help you see a way to deal with your circumstances and still complete your courses. We have a lot of experience. Give us the chance to help you.

Learning

What matters most in any course is what you learn. This course allows you many ways to learn, such as reading your textbook, following the hands-on practice in your assignments, communicating with your classmates and your instructor, and discovering other resources across the Internet. If you actively participate in your course, you will get constructive feedback to help you with your learning. Stay active in your course and focused on your learning to get the most out of it.

Changes

Occasionally, circumstances require the instructor to change the syllabus. Should the instructor find a change necessary, you will be notified as soon as possible. You might print this syllabus for a ready referral.

Agreement

If you disagree with any of the policies or procedures spelled out above or cannot accept the demands of the course (i.e., the amount of time and work required), you need to drop the course as soon as possible. By staying in the course, you agree to comply with all the policies and procedures described in this syllabus.

Reminder

Your instructor should be your first point of contact and support for any questions or concerns you have about this course.

General Policies & Procedures

Students are expected to adhere to all policies and procedure outlined by Clemson University at [University Policies](#):

<http://www.clemson.edu/administration/student-affairs/student-handbook/universitypolicies/index.html>.

Online Conduct

Appropriate online academic conduct means maintaining a safe learning environment based on mutual respect and civility. All participants in Clemson courses are expected to behave professionally by adhering to these standards of conduct:

- Never transmit or promote content known to be illegal.
- Respect other people's privacy as well as your own.
- Forgive other people's mistakes.
- Never use harassing, threatening, embarrassing, or abusive language or actions.

Privacy Policy

Online communication that fails to meet these standards of conduct will be removed from the course. Repeated misconduct may result in being blocked from online discussions, receiving a

grade penalty, or being dismissed from the course. Such misconduct in the online environment may also be reported to officials for appropriate action in accordance with university policy. If you ever encounter inappropriate content in our course, please contact me, the instructor, with your concerns.

This course is designed with student privacy in mind. If, however, you feel that an assignment or technology tool undermines your right to privacy, please contact the instructor immediately. We will work together to determine an alternative assignment that will help you achieve the course learning outcomes.

Academic Integrity

Coursework must be documented appropriately in CSE or APA format, based on your major. Content from previous classes may not be submitted.

The Clemson University Academic Integrity Statement

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning." Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

A simple definition of plagiarism is when someone presents another person's words, visuals, or ideas as his or her own. The instructor will deal with plagiarism on a case-by-case basis. The most serious offense within this category occurs when a student copies text from the Internet or from a collective file. This type of academic dishonesty is a serious offense that will result in a failing grade for the course as well as the filing of a formal report to the University.

See the [Undergraduate Academic Integrity Policy](#) website for additional information about academic integrity and Clemson procedures and policies regarding scholastic dishonesty.

Email Communication

Because of privacy regulations, University faculty and staff may email students only through Clemson's email. Therefore, you must use your Clemson email account in this course for all email communications. Check your Clemson account at least three times per week for important messages.

Student Disability Services

Student Disability Services coordinates the provision of accommodations for students with disabilities in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.

Reasonable and specific accommodations are developed with each student based on current documentation from an appropriate licensed professional. All accommodations are individualized, flexible, and confidential based on the nature of the disability and the academic environment. Housing accommodations for a disability or medical condition are also coordinated through this office.

Students with disabilities requesting accommodations should make an appointment with Dr. Margaret Camp (656-6848), Director of Disability Services, to discuss specific needs within the first month of classes. Students should present a Faculty Accommodation Letter from Student Disability Services when they meet with instructors. Accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester. Visit the [Student Disability Services](#) website for location, contact information, as well as official policies and procedures. To learn more information or request accommodations contact Student Disability Services (SDS) at sds-l@clemson.edu or [864.656.6848](tel:864.656.6848) or visit SDS's website: <http://www.clemson.edu/campus-life/campus-services/sds/about.html>.

Academic Support Services

Students may access a variety of academic support services to support your learning in the classroom. Here are links to services available:

- Academic Success Center <http://www.clemson.edu/asc/staff.html>
- The Writing Center <http://www.clemson.edu/centers-institutes/writing/>
- Online Library Resources <http://www.clemson.edu/library/>
- CCIT (Tech Support) http://www.clemson.edu/ccit/help_support/ or CCIT (Tech Support) email: ithelp@clemson.edu
- Academic Advising <http://www.clemson.edu/academics/advising/index.html>
- Registrar <http://www.registrar.clemson.edu/html/indexStudents.htm>

Accessibility

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the professor know and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848 or by emailing studentaccess@lists.clemson.edu. Students who receive Academic Access Letters are strongly encouraged to request, obtain, and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: <http://www.clemson.edu/campus-life/campusservices/sds/>.

Commitment To Diversity

Clemson University aspires to create a diverse community that welcomes people of different races, cultures, ages, genders, sexual orientations, religions, socioeconomic levels, political perspectives, abilities, opinions, values, and experiences.

The Clemson University Title IX (Sexual Harassment) Statement:

Title IX Policy: Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity (e.g., opposition to prohibited discrimination or participation in any complaint process, etc.) in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. The University is committed to combatting sexual harassment and sexual violence. As a result, you should know that University faculty and staff members who work directly with students are required to report any instances of sexual harassment and sexual violence, to the University's Title IX Coordinator. What this means is that as your professor, I am required to report any incidents of sexual harassment, sexual violence or misconduct, stalking, domestic and/or relationship violence that are directly reported to me, or of which I am somehow made aware. There are two important exceptions to this requirement about which you should be aware: Confidential Resources and facilitators of sexual awareness programs such as "Take Back the Night and Aspire to be Well" when acting in those capacities, are not required to report incidents of sexual discrimination. Another important exception to the reporting requirement exists for academic work. Disclosures about sexual harassment, sexual violence, stalking, domestic and/or relationship violence that are shared as part of an academic project, a research project, classroom discussion, or course assignment, are not required to be disclosed to the University's Title IX Coordinator. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Executive Director for Equity Compliance and the Title IX Coordinator. Her office is located at 223 Holtzendorff Hall, phone number is 864.656.3181, and email address is alesias@clemson.edu.

Academic Continuity Plan:

Clemson has developed an Academic Continuity Plan for academic operations. Should university administration officially determine that the physical classroom facility is not available to conduct classes in, the class will be conducted in a virtual (online) format. The University issues official disruption notifications through email /www /text notification/social media.

When notified, use one of the following links to navigate to Clemson Canvas where you will find important information about how we will conduct class:

Primary access link: www.clemson.edu/canvas

Secondary access link, if needed: <https://clemson.instructure.com/>

You can also use the Canvas Student App.

Our activities for teaching and learning will occur through our Canvas course. This includes: information on the preferred method(s) of teaching and learning. Refer to the Clemson Online sheet “teaching in a planned/unplanned event” to create your plans.

Inclement Weather Statement:

Any exam that was scheduled at the time of a class cancellation due to inclement weather will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless contacted by the instructor. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

University officials monitor local weather conditions before making decisions to cancel classes, close offices, or delay openings. For updates on the status of Clemson classes and office closings:

- Check the Clemson University homepage (<http://www.clemson.edu/>) for messages about closings or delays.
- Check the CU Safety page (<http://www.clemson.edu/cusafety/>) for detailed messages and weather advisories.
- Check your Clemson University e-mail for CU Safe Alerts or Inside Clemson messages.
- Check your cell phone if you have signed up to receive CU Safe Alert text messages (See the CU Safety page for sign-up instructions);
- Call the Clemson University switchboard at 656-3311 for recorded updates between 8 p.m. and 8 a.m. Monday-Friday and on weekends (recorded messages provide closure information, not weather forecasts); and
- Tune in to local TV and radio stations or log on to their Web sites.
- When local county government offices are closed, local Clemson University campuses also are closed.

Clemson University is committed to providing a safe campus environment for students, faculty, staff, and visitors. As members of the community, we encourage you to take the following actions to be better prepared in case of an emergency:

- a. Ensure you are signed up for emergency alerts (<https://www.getrave.com/login/clemson>),
- b. Download the Rave Guardian app to your phone (<https://www.clemson.edu/cusafety/cupd/rave-guardian/>)
- c. Learn what you can do to prepare yourself in the event of an active threat (<http://www.clemson.edu/cusafety/EmergencyManagement/>)

Copyright Notice

The materials found in this course are strictly for the use of students enrolled in this course and for purposes associated with this course; they may not be retained or further disseminated. They are provided in compliance with the provisions of the Teach Act. Students should be reminded to refer to the [Use of Copyrighted Materials and “Fair Use” Guide](#) at Clemson

Libraries, for additional information. Clemson students, faculty, and staff are expected to comply fully with institutional copyright policy as well as all other copyright laws.

Important Dates

January 26: Last day to drop a class or withdraw from the University without a W grade

March 18: Last day to drop a class or withdraw from the University without final grades

Exam dates

Midterm exam-1: Thursday, February 10th from 7:00 pm to 8:00 pm.

Midterm exam-2: Thursday, March 17 from 7:00 pm to 8:00 pm

Midterm exam-1: Thursday, April 21st from 7:00 pm to 8:00 pm

Final Exam: Wednesday, May 4th from 7:00 pm until 9:30 pm