

Course Information

Course Number:	PHYS 206
Course Title:	Newtonian Mechanics for Engineering and Science
Sections:	<i>Section</i>
Time:	Lecture – 4:10-5:25 (543-547), 5:45-7:00 (555-560) Recitation – See Howdy for specific section details. Exams – Midterm #1: Monday Feb. 12 th , 7:30-9:30pm Midterm #2: Monday Mar. 25 th , 7:30-9:30pm Midterm #3: Monday Apr. 15 th , 7:30-9:30pm Comprehensive Exam: Friday Apr. 26 th , 5:00-7:00pm
Location :	Lecture – MPHY 204 Recitation – See Howdy for specific section details. Exams – Location TBD and will be announced via Canvas.
Credit Hours:	3

Instructor Details

Instructor:	Rupak Mahapatra
Office:	MIST 417
Phone:	(979)229-4196
E-Mail:	mahapatra@tamu.edu
Instructor website:	https://people.tamu.edu/~mahapatra/teaching.html
Office Hours:	See on the website above

Course Coordinator Details

Co-coordinator:	Dr. Larry May
E-Mail:	larry.may@tamu.edu
Co-coordinator:	Dr. Mike Youngs
E-Mail:	mdyoungs@tamu.edu

Course Description

Newtonian Mechanics for Engineering and Science. Calculus-based introductory Newtonian mechanics; laws of physical motion for solution of science and engineering problems.

This is the first semester of a two-semester sequence in introductory physics primarily intended for students pursuing degrees in STEM fields. By the end of the course students will understand, describe and apply the laws of physical motion to the solution of science and engineering problems.

Knowledge to gain: Understanding of the physical laws of motion, static and dynamical Newtonian mechanics, and harmonic motion.

Skills to gain: To think more critically/scientifically, and develop the skills needed to solve difficult multi-step problems.

Course Prerequisites

Grade of C or better in MATH 151 or MATH 171, or equivalent.

You must have a working knowledge of plane geometry, trigonometry, and algebra. As the semester progresses you will also be expected to have a working knowledge of derivatives and integrals, and be proficient in the use of vectors (addition, subtraction, dot and cross products).

Special Course Designation

This course meets the state requirements for Core Curriculum in Life and Physical Science. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

Course Learning Outcomes

- **Critical Thinking Skills:** to include creative thinking, innovation, inquiry, and analysis, evaluation, and synthesis of information.
- **Communication Skills:** to include effective development, interpretation, and expression of ideas through written, oral, and visual communication.
- **Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
- **Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Textbook and/or Resource Materials

The text is “University Physics”, 15th ed., Young and Freedman, Chapter 1-11, 13, 14 see Canvas for registration to Pearson’s online homework. Look for bundled access, including a copy of the text, access to the electronic version of the text, and access for homework and pre-lectures. You may purchase the text separate from the web access for homework and pre-lectures, but there is a price break for purchasing the bundle.

You are expected to regularly check Canvas for announcements and access materials as well as access MasteringPhysics. MasteringPhysics is not designed to work well on phones and as such you should have regular and frequent access to a computer with an internet connection.

Students will be expected to do in-depth numerical calculations on exams and as such students are allowed the use of a calculator that cannot wirelessly connect to the internet during that exam. It is strongly encouraged that students practice using the same calculator for solving homework and recitation problems. A student using a non-approved calculator on an exam will obtain a zero for that exam.

It is recommended that the chosen calculator can perform calculations using trigonometric, exponential and logarithmic functions. You are allowed to use any calculator listed on the College Board’s SAT Calculator Policy page: <https://satsuite.collegeboard.org/sat/what-to-bring-do/calculator-policy>. The Calculator Tips on this page are also applicable to our course.

In-class participation and conceptual testing will be done using the iClicker system. We will utilize the iClicker Cloud Reef polling using smartphones and/or laptops. Physical clickers will not be used. iClicker

login information for your section can be found in Canvas. Please direct all technical issues to the support team at iclicker.com.

Grading Policy

It is possible that the following thresholds may be lowered at the discretion of the course coordinators, but these thresholds will not be increased. For example, a grade of 89.76 will be considered a “B” unless the course coordinators decide to lower the threshold to something below an 89.76. If thresholds change, they will be changed for every student and announced formally on Canvas.

Letter Grade	Overall Course Grade
A	≥90
B	≥80
C	≥65
D	≥50
F	<50

The overall course grade is composed as follows:

Course Component	Non-honors sections	Honors Sections
Exams (Learning Objectives)	70%	70%
Prelectures	6%	5%
Homework	6%	5%
Recitation	6%	5%
Concept Quizzes	6%	5%
iClicker	6%	5%
Honors Assignments	-	5%

Late Work Policy

Late submissions (submission past the posted due date/time) are **NOT** accepted for credit, except by extenuating circumstances, on Homework, Concept Quizzes and Honors Assignments. Prelectures may be completed late at a 20% penalty per day (additive). If you feel that you are a part of a situation that deserves further scrutiny, contact the course coordinators.

Work submitted by a student as makeup work for an excused absence is not considered late work and is exempted from the late work policy ([Student Rule 7](#)).

Course Schedule

The course will proceed in the following order. The material covered on each exam will follow the notation below. Should a situation arise that requires a modification to what is given below, all students will be notified through Canvas and/or email as well as in class (if able).

- Chapter 1 – Units, Physical Quantities and Vectors
- Chapter 2 – Motion Along a Straight Line
- Chapter 3 – Motion in Two or Three Dimensions

- **Midterm #1 on 2/12 covering Chapters 1-3**
- Chapter 4 – Newton’s Laws of Motion
- Chapter 5 – Applying Newton’s Laws
- Chapter 6 – Work and Kinetic Energy
- Chapter 7 – Potential Energy and Energy Conservation
- **Midterm #2 on 3/25 covering Chapters 4-7**
- Chapter 8 – Momentum, Impulse and Collisions
- Chapter 9 – Rotation of Rigid Bodies
- Chapter 10 – Dynamics of Rotational Motion
- Chapter 11 – Equilibrium
- **Midterm #3 on 4/15 covering Chapters 8-11**
- Chapter 13 – Gravitation
- Chapter 14 – Periodic Motion
- Chapter 15* – Mechanical Waves (may be covered in class, will not be on the comprehensive)
- **Comprehensive Exam on 4/26 covering Chapters 1-11, 13, 14**

Additional Course Information Items

Webpages

- Canvas – main course website for your class (will have lecture notes, grades and HW access).
- mechanics.physics.tamu.edu/ – common course website for all sections using the “Physics for Scientist and Engineers” textbook.
- <https://mlm.pearson.com/northamerica/masteringphysics/> – Mastering Physics by Pearson for homework submission and pre-lecture materials. Register through the link provided on your Canvas class webpage.
- freshman.physics.tamu.edu/p218 – to check your status on achieved learning objectives.

Absences

If you miss an exam or a recitation due to a university-excused absence as outlined in the University Regulations (see below), you should fill out the Absence Report Form in Canvas no later than the 2nd business day following the last date of absence (per Student Rule 07). Note: Few conditions qualify as an excused absence, so you must avoid missing exams except for extremely serious circumstances. See Student Rule 07 for details <https://student-rules.tamu.edu/rule07/>

Any excused absences must be reported by submitting the Google form in Canvas and attaching the appropriate documentation. Notification of the absence via the Google form *must* be received within 2 business days of the last date of absence. If you do not yet have documentation, submit notification of your absence and then resubmit the form once you have documentation as well. Failure to submit absence *notification* within the required timeline will result in the absence being declared “unexcused”. Final decisions on whether an absence will be excused will be made by the course coordinators.

Excused absences as defined by Student Rule 07 only apply to physical attendance and participation. To receive an extension for online submissions, your absence documentation must explicitly specify your inability to complete online work for an extended period. Student Rule 07 does not apply to the online submitted work and as such all extensions are at the sole discretion of the course coordinators.

Prelectures

PHYS 206 lectures try to follow a “flipped course” model, and as part of that we are using a pre-lecture system hosted on the Pearson site. See the homework description on Canvas for instructions on accessing our Pearson course. Students are expected to read the associated chapter in the textbook and then complete the prelecture assignment which includes narrated slides and some online questions. These will generally be due before a chapter has been addressed in lecture. Prelectures may be completed late at a 20% penalty per day (additive).

Homework assignments

Homework assignments are hosted (in addition to the Prelectures) in MyLab and Mastering in Canvas. You are responsible for completing the assigned HW problems and understanding how to solve similar problems. See instructions on Canvas.

The homework assignments for the chapters covered on an exam are due by 11:59 pm two calendar days before the exam covering that material. For example, Midterm #1 on Monday Feb. 12th covers Chapters 1-3 so the homework for all three chapters is due at 11:59 pm on Saturday Feb. 10th. Students are given significant flexibility to complete these assignments, however it cannot be stressed enough that they should be completed at a similar pace to the chapters covered in class. Do not wait until the day they are due to begin them. While the HW grade credit is only 6% (5% for Honors sections) of the overall grade, thoroughly working through and understanding the problems is pivotal to succeeding in this course.

Late submissions are **NOT** accepted for credit, except by extenuating circumstances, but if you feel that you are a part of a situation that deserves further scrutiny, contact the course coordinators. Waiting until the day the assignment is due and encountering technical issues with internet, websites or equipment is *not* an extenuating circumstance – it is poor planning. Due dates for online submissions are the *last* date an assignment can be completed, not the only date. Work should be completed as early as possible to maintain pace with the material in the course.

Students receive 6 attempts to supply correct answers to problems. Multiple choice problems will be penalized proportional to the number of answers to choose from. Other problems where an answer must be entered by the student, the first 5 incorrect submissions will receive a 3% penalty each. More details on the grading policy for individual problems are given on the HW website.

There are three naming conventions in Mastering Physics:

Chapter ## Assignment – these are what are considered for the Homework grade.

Prelecture Ch. ## -- these are what are considered for the Prelecture grade.

Chapter ## Extra Practice – These are extra problems that are available for all students. These will not be considered for a grade for any student, however, there is some evidence that shows mastery of these problems leads to increased performance in the course.

Canvas Concept Quizzes

There will be quizzes for each chapter in Canvas that will be due two calendar days before each exam. Each attempt at a quiz will be given a one-hour time window to complete and students are allowed and encouraged to use their notes and textbook to complete. The quizzes are heavily weighted towards

conceptual understanding with relatively little mathematical calculations to be done. Students will be given unlimited attempts at these quizzes and the best score will be counted from all attempts. Students are free to work with each other on these quizzes, however it should be known that there are pools of questions that the quizzes will be pulling from, so each attempt will have different combinations of questions on them for each student.

Like the homework assignments, students are given significant flexibility to complete these quizzes and as such late submissions will NOT be accepted. Students should be attempting these around the time that a chapter is finished in lecture. Ideally, students should use concept quizzes to “pretest” their knowledge from reading the textbook and should continually take them to improve/reinforce understanding of the course concepts.

Recitation

Along with the lecture portion of the course, students will meet weekly for an 80-minute recitation section. The purpose of these recitation meetings is to give you an opportunity to ask questions about the material covered in recent lectures and prepare to answer the assigned homework questions. Each recitation session will cover representative problems from the chapter being studied. Students are expected to bring a device capable of accessing pdf files from the internet for recitation. You can find these problems posted on the class website at mechanics.physics.tamu.edu/recitations.shtml.

Your recitation grade will be determined by your TA based on your participation, and active contributions with your group in the recitation sessions. The grading expectations can be accessed at the top of the webpage containing the recitation problems.

iClicker

To encourage class participation, credit for iClickers will be based on a combination of poll questions and quiz questions at your instructor’s discretion. Poll questions are predominantly based on simple answering, regardless of whether your answer is correct or not, while quiz questions are graded with credit based on correct answers. iClicker login information for your section can be found in Canvas. Please direct all technical issues to the support team at iclicker.com. All absences regarding iClicker should be communicated directly with your instructor, *not* via the Absence Form.

Exams

There will be 4 common evening exams (3 “midterms” and one “comprehensive”). The midterm exams are on the first three Monday evening sessions (2/12, 3/25 and 4/15) and the comprehensive is on the last Friday evening session (4/26) included in the course schedule when you registered. The midterms start at 7:30 pm and the comprehensive starts at 5:00 pm. There will not be an exam during finals week. All exams are scheduled for 120 minutes however they are designed to be completed in less time than that for adequately prepared students. Exams generally consist of problems similar in content and difficulty to the problems of the homework and as discussed in class and recitation. Formula sheets will be provided for each exam; example formula sheets are available on the PHYS 206 course website for your reference (mechanics.physics.tamu.edu/). You are encouraged to download/print out a copy of the formula sheet for your own use during homework and recitation.

Students that receive accommodation through Disability Resources must contact the course coordinators for testing information. Students that are approved to take exams in the testing center

must schedule their exams so that their scheduled time window overlaps with the regularly scheduled start time of the exam. If a student completes the exam before the start time, they will be required to stay until the scheduled start time of the common exam. All other exams with accommodation will be proctored by the course instructors/TAs.

The “Exams” portion of the overall course grade includes the three midterm exams as well as the comprehensive exam. Exams are graded in terms of learning objectives. The complete list of learning objectives that a student is supposed to master by the end of the semester is posted at mechanics.physics.tamu.edu/los.html.

Each exam tests several different learning objectives and could test the same learning objective multiple times. During the grading we keep track of every instance in which a learning objective is tested and whether in that instance the objective was marked as passed or failed. Learning objectives will also be tested multiple times across exams. You may view your status on your achieved learning objectives throughout the semester by logging on with your NetID at <https://freshman.physics.tamu.edu/p218>.

At the end of the semester we call achieved objectives as those who pass either of the criteria below:

- were marked as passing $\geq 60\%$ of the tested times in the comprehensive exam.
- were marked as passing $\geq 60\%$ of the tested times in all exams in which they were tested, including the comprehensive exam.

The fraction of achieved objectives at the end of the semester out of the number of tested objectives gives the numerical grade in the “Exams” portion of the table above. As an example, if a student has achieved 43 objectives out of the total of 50 objectives tested, he/she has earned 86% of the exams portion of the course grade.

Make Up Exams

For approved excused absences that have been submitted through the Google form and documentation has been verified by the course coordinators, there will be a scheduled makeup exam from 7:30-9:30 pm on the Thursday following each midterm exam and the make-up Comprehensive exam will be given from 7:30-9:30 pm on Tuesday April 30th. The location of makeup exams will be detailed by the course coordinators when excused absences are verified.

Identification

You MUST bring your TAMU student ID with you to all exams for identification purposes. Failure to prove a student’s identity when turning in an exam could result in a zero grade for that exam.

Learning Resources

There are a variety of resources available to students to help them succeed. Ask questions of your professor and TA and attend their office hours. If there is a Supplemental Instruction (SI) leader for the course, details will be posted to Canvas. The Academic Success Center (<https://asc.tamu.edu/study-learning-handouts>) also has a variety of handouts to help students study. If you are struggling with the course, *ask questions* so that we can help you in the best way possible. Canvas also has a “Student resources” module that details other learning resources to help you in physics this semester.

Honors sections only

To receive honors credit for a course, the course is “expected to provide increased intellectual challenge through more sophisticated material, a higher level of intellectual engagement, and more responsibility

for the learning process than would typically be expected in an undergraduate course.” As such, in addition to more in-depth material in lectures, additional Honors assignments will be required for Honors sections. These assignments will be discussed on the first day of class and details can be found on Canvas. **Exams between honors and non-honors sections will be identical.**

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must always keep appropriate records. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact the Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Resources and their instructors as soon as possible. Disability Resources is in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care by utilizing available resources and services on your campus.

Students who need someone to talk to can contact Counseling & Psychological Services (CAPS) or call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the *988 Suicide & Crisis Lifeline (988)* or at [988lifeline.org](https://www.988lifeline.org)

Campus-Specific Policies

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to howdy.tamu.edu and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete [FERPA Notice to Students](#) and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.