

**The University of Texas at Tyler**  
**University Physics I**  
**PHYS 2325**  
**Fall 2024**  
**WTB 136**  
**MWF 8:00 AM – 8:55 AM**

<b>Instructor</b>	Dr. Richard Batman, Ph.D.
<b>Office</b>	RBN 4045
<b>Phone</b>	(903) 566-7477 (I prefer email to phone calls.)
<b>Email</b>	rbatman@uttyler.edu ( <b>Never attempt to contact me through the Canvas system. You must send emails directly to rbatman@uttyler.edu. Please include the course number 2325 in the body of each email.</b> )
<b>Office Hours</b>	My office hours this semester are tentatively planned for: MWF 9:45 AM – 10:45 AM T 12:15 PM – 1:15 PM R 3:00 PM – 4:00 PM ( <b>Or by appointment.</b> Times are approximate. Please stop by my office anytime you have questions, even outside of office hours. I'll almost certainly be available to help.)
<b>Textbook</b>	<i>Physics for Scientists and Engineers</i> , 5th ed., Knight, ISBN 978-0-136-95629-7. In addition to buying this book, each student must pay to register for the MasteringPhysics online homework system at <a href="https://mlm.pearson.com/northamerica/masteringphysics/">https://mlm.pearson.com/northamerica/masteringphysics/</a> , using course I.D. <b>batman40720</b> . MasteringPhysics will give you the option of buying a digital version of the textbook. <b>You are required to bring to each lecture session the textbook and a scientific calculator that has a screen no more than one inch in height and no graphing or equation solving capability.</b> (Most TI-30s are acceptable, particularly the TI-30X IIS. Any calculator with one or more buttons labeled, "Solv," is not acceptable. <b><u>For example, the TI-36X Pro may not be used.</u></b> ) <b>If you do not have such a calculator, you are required to buy one. It must be set to display answers in scientific notation. You may not use a calculator with a larger screen or graphing or equation solving capability on any quiz or exam.</b>
<b>Prerequisite</b>	MATH 2413 (Calculus I).

### Course Topics

This course will stress the application of mechanical concepts and principles to solving elementary physics problems, many of which will involve calculus. It is intended to develop the problem-solving skills and advanced mathematical skills that are necessary for success in advanced courses or standardized exams in physics. Major topics covered will include kinematics, Newton's laws of motion, conservation of energy, and conservation of momentum.

## Math Background Requirements

Calculus I is a pre-requisite for this course. Students should be able to differentiate and integrate polynomials and trigonometric functions. Further math skills will be developed as needed. **If you feel uncomfortable with any of the math discussed, please inform me immediately.** I will help you individually, or, if the class as a whole has a problem with a particular topic, I will address the topic during class.

## Communication Policy

All students are required to frequently check the announcements on the Canvas website for information and notifications that will need to be posted between class sessions. You will be held responsible for acting in accordance with all such communications. Lectures will generally be based on PowerPoint presentations posted in advance on Canvas, which you will be required to download prior to class. Be sure to check the Canvas website just before each lecture to see whether a new one has been posted.

## Homework, Quizzes, and Exams

1. Each homework assignment will be administered by the MasteringPhysics website at <https://mlm.pearson.com/northamerica/masteringphysics/>. **Assignment #1 in MasteringPhysics (“Introduction to MasteringPhysics”) will not affect your grade. However, all later assignments will affect your final grade and must be completed by their deadlines. You will receive no credit from me or from Mastering (zero points) for problems completed after the deadline for any assignment.**
2. Tentative dates of exams and quizzes are noted in the “Tentative Semester Schedule” later in this syllabus. You will not be permitted to wear a hood, hat, headphones, ear buds, air pods, etc., while taking any quiz or exam.
3. Exams will include any material we have covered up to that point, including problems worked in class or given as homework or in quizzes. Regular exams will be semi-cumulative, in the sense that they will focus on material covered since the last exam but will also necessarily include material that came before. The final exam will be fully cumulative and will cover the entire semester.

## Late Assignments and Make-Ups

1. Late homework will generally not be accepted, except when I notify you otherwise about a particular assignment or when I judge that there are very good reasons (*e.g.*, severe illness, family emergency, *etc.*) for giving an extension to a particular student. I cannot guarantee in advance that an extension will be given in a particular situation. (As stated above, **you will receive no credit from me or from Mastering (zero points) for problems completed after the deadline for any assignment.**) **To have a chance of getting an extension for a given assignment, you must send me *by email* a notification and detailed description of your situation, along with a request for an extension, within one week after the submission deadline. The sooner, the better.** Late notification is grounds for denying an extension. No more than three homework extensions will be given to any student during the semester.

2. **For exams and quizzes, make-ups are generally allowed for excused absences only. I cannot guarantee in advance that a make-up will be allowed in a particular situation. Do not assume, without first discussing the circumstances with me, that your absence from a quiz or exam will be excused.** For anticipated excused absences, you must make arrangements **before your absence** to make up the assignment. For unanticipated excused absences in which an exam or quiz is missed, it is your responsibility to arrange a make-up for the assignment. I will not remind you. **Failing to send me by email a notification and detailed description of your situation, along with a request for a make-up, within one week after a missed exam or quiz, is grounds for denying the make-up. Please send the notification ASAP.** No more than two exams (including the final) can be made up during the semester, and no more than three quizzes. (A make-up is defined as taking a quiz or exam at a different time from the rest of the students, whether it is taken before or after the regularly scheduled time.) **Remember that quizzes are worth 18% of your semester grade.**
3. **It is your responsibility to check your grades on Canvas frequently throughout the semester and to notify me immediately if there are any errors** (incorrect point values, missing grades, etc.) in the grade book. **After semester grades have been submitted for the course, no corrections will be made without documentary proof of the error. No assignments of any kind will be accepted or made up on or after the day that semester grades are due to be submitted.**

## Graded Work and Assessments

1. **The “Total” column of the Canvas grade book does not accurately show your current, overall course grade.** The Canvas grade book shows accurate grades for individual assignments only.
2. **You are responsible for keeping all your graded work in good condition throughout the semester,** just in case I need it later as proof of your performance (see item 3 in the previous section).
3. Please look over your exam and quiz results and ask questions about your grades during my office hour (not during class) if you think there’s a grading error, or if you don’t understand what you did wrong.

### Grading Scale

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A	90-100%
B	80-90%
C	70-80%
D	60-70%
F	<60%

## Semester Assessment

Regular Exams	44%
Homework	20%
Quizzes	18%
Final Exam	18%

### Student Academic Conduct

During quizzes and exams, students are to work alone and not help each other, look on each other's papers, or refer to outside sources of information. Cheating will not be tolerated.

### Tentative Semester Schedule

Please note: numbers in parentheses given after lists of topics in the schedule below refer to the appropriate sections in the book *Physics for Scientists and Engineers*, 5th ed., Knight.

<b>Week 1</b>	<p><b>Aug 26:</b> Introduction to the course.</p> <p><b>Aug 28:</b> Motion diagrams; definitions of position, displacement, time, average speed, and average velocity. (1.1 – 1.4)</p> <p><b>Aug 30:</b> Linear acceleration; motion in 1-D; solving problems in physics. (1.5 – 1.7)</p>
<b>Week 2</b>	<p><b>Sept 2: No class for Labor Day</b></p> <p><b>Sept 4:</b> Significant figures; scientific notation; units; unit conversions. (1.8)</p> <p><b>Sept 6:</b> Motion graphs; equations of uniform motion; definition of instantaneous velocity; finding position from velocity. (2.1 – 2.3)</p>
<b>Week 3</b>	<p><b>Sept 9: Quiz 1.</b> Motion with constant acceleration and 1-D kinematics. (2.4)</p> <p><b>Sept 11:</b> Free-fall; motion on inclined plane; instantaneous acceleration. (2.5 – 2.7)</p> <p><b>Sept 13: Exam 1 Review.</b></p>
<b>Week 4</b>	<p><b>Sept 16: Exam 1.</b></p> <p><b>Sept 18:</b> Graphical addition, scalar multiplication, and subtraction of vectors; decomposing vectors into components; algebraic addition and subtraction of vectors. (3.1 – 3.4)</p> <p><b>Sept 20:</b> Acceleration as a vector; 2-D kinematics; projectile motion. (4.1 – 4.2)</p>
<b>Week 5</b>	<p><b>Sept 23: Quiz 2.</b> Solving projectile motion problems. (4.2)</p> <p><b>Sept 25:</b> Uniform circular motion; non-uniform circular motion; angular acceleration. (4.4 – 4.6)</p> <p><b>Sept 27:</b> The definition of force; net force; conceptual introductions to weight, spring force, tension, normal force, friction, drag, and thrust; identifying forces. (5.1 – 5.3)</p>
<b>Week 6</b>	<p><b>Sept 30: Quiz 3.</b> Newton's second law; Newton's first law; free-body diagrams. (5.4 – 5.7)</p> <p><b>Oct 2:</b> Equilibrium; dynamics. (6.1 – 6.2)</p> <p><b>Oct 4: Exam 2 Review.</b></p>
<b>Week 7</b>	<p><b>Oct 7: Exam 2.</b></p> <p><b>Oct 9:</b> Mass and weight; weightlessness; friction. (6.3 – 6.4)</p> <p><b>Oct 11:</b> Static and kinetic friction; drag. (6.4 – 6.6)</p>

<b>Week 8</b>	<b>Oct 14: Quiz 4.</b> Interacting objects; Newton's third law. (7.1 – 7.3) <b>Oct 16:</b> Ropes and pulleys; examples of interacting object problems. (7.4 – 7.5) <b>Oct 18:</b> Dynamics in 2-D; uniform circular motion. (8.1 – 8.2)
<b>Week 9</b>	<b>Oct 21:</b> Circular orbits; fictitious forces; non-uniform circular motion. (8.3 – 8.5) <b>Oct 23: Quiz 5.</b> The concept of energy; work and kinetic energy for a single particle; calculating work (9.1 – 9.3) <b>Oct 25: Exam 3 Review.</b>
<b>Week 10</b>	<b>Oct 28: Exam 3.</b> <b>Oct 30:</b> Work done by a spring; dissipative forces and thermal energy; power. (9.4 – 9.6) <b>Nov 1:</b> Gravitational potential energy; elastic potential energy. (10.1 – 10.3)
<b>Week 11</b>	<b>Nov 4:</b> Conservation of energy; energy diagrams; force and potential energy; conservative and nonconservative forces. (10.4 – 10.7) <b>Nov 6: Quiz 6.</b> Momentum and impulse; conservation of momentum; collisions and explosions. (11.1 – 11.4) <b>Nov 8:</b> Two-dimensional collisions. (11.5)
<b>Week 12</b>	<b>Nov 11: Quiz 7.</b> Rotational motion; center of mass; rotational energy; calculating moment of inertia. (12.1 – 12.4) <b>Nov 13:</b> Torque; rotational dynamics; rotation about a fixed axis. (12.5 – 12.7) <b>Nov 15: Exam 4 Review.</b>
<b>Week 13</b>	<b>Nov 18: Exam 4.</b> <b>Nov 20:</b> Static equilibrium. (12.8) <b>Nov 22: Quiz 8.</b> Rolling motion; vector description of rotational motion; angular momentum. (12.9 – 12.11)
<b>Week 14</b>	<b>Nov 25: No class for Thanksgiving.</b> <b>Nov 27: No class for Thanksgiving.</b> <b>Nov 29: No class for Thanksgiving.</b>
<b>Week 15</b>	<b>Dec 2:</b> Newton's law of gravity; little $g$ and big $G$ . (13.1 – 13.4) <b>Dec 4:</b> Gravitational potential energy; satellite orbits and energies. (13.5 – 13.6) <b>Dec 6: Quiz 9. Final Exam Review.</b>
<b>Week 16</b>	<b>Dec 9: No class.</b> <b>Dec 11: Final exam 8:00 AM – 10:00 AM.</b> <b>Dec 13: No class.</b>

### Important COVID-19 Information for Classrooms and Laboratories

It is important to take the necessary precautions to ensure a healthy and successful year. UT Tyler continues to urge you to protect yourselves against the flu, COVID and any new threats that may be developing. Be diligent about preventive measures such as washing hands, covering sneezes/coughs, social distancing and vaccinations, which have proven to be successful in slowing the spread of viruses. Encourage those who don't feel well to stay home, and if they show symptoms, ask them to get tested for the flu or COVID. Self-isolation is important to reduce exposure ([CDC quarantine/isolation guidelines](#)). Please work with your faculty members to maintain coursework and please consult [existing campus resources](#) for support.

## Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission. **I am not planning to record or telecast any lectures this semester, except to provide legally required accommodations or as necessary to compensate for COVID restrictions imposed by the university.**

## UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

## Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

## Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

## UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit [www.uttyler.edu/tobacco-free](http://www.uttyler.edu/tobacco-free).

## Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each

semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

### **State-Mandated Course Drop Policy**

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

### **Disability/Accessibility Services**

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

## **Student Absence due to Religious Observance**

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

## **Student Absence for University-Sponsored Events and Activities**

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

## **Social Security and FERPA Statement**

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

## **Emergency Exits and Evacuation**

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

## **Student Standards of Academic Conduct**

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

- i. "Cheating" includes, but is not limited to:
  - copying from another student's test paper;
  - using, during a test, materials not authorized by the person giving the test;
  - failure to comply with instructions given by the person administering the test;
  - possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
  - using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
  - collaborating with or seeking aid from another student during a test or other assignment without authority;



- discussing the contents of an examination with another student who will take the examination;
  - divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
  - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
  - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
  - falsifying research data, laboratory reports, and/or other academic work offered for credit;
  - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
  - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
  - iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
  - iv. All written work that is submitted will be subject to review by plagiarism software.

### **Artificial Intelligence Statement**

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools’ ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler’s Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course (see below) is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler’s Academic Integrity Policy.

The work submitted by students in this course will be generated by themselves. This includes all items in all exams (including the final exam), all quizzes, and all homework assignments. Any instance of the following constitutes a violation of UT Tyler's Honor Code: a student has another person/entity do any portion of a graded assignment, which includes purchasing work from a company, hiring a person or company to complete an assignment or exam, using a previously submitted assignment and/or using AI tools (such as ChatGPT).

### UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), [writingcenter@uttyler.edu](mailto:writingcenter@uttyler.edu)
- UT Tyler Tutoring Center (903.565.5964), [tutoring@uttyler.edu](mailto:tutoring@uttyler.edu)
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

**In addition to the resources listed above, each student will have unlimited access to Upswing, our 24/7 online tutoring service, at the link below:**

### Upswing Online Tutoring

<https://uttyler.upswing.io/>

**The census date, which is the last day to drop without a W, is Monday, September 9.**

**Please do not offer me any gifts, because I am not allowed to accept them.**

### Course Objectives/Student Learning Outcomes

1. **Critical Thinking Skills** (includes creative thinking, innovation, inquiry and analysis, evaluation and synthesis of information). The student will demonstrate the ability to think critically and to use appropriate concepts to analyze qualitatively problems or situations involving the fundamental principles of physics.
2. **Empirical and Quantitative Skills** (includes the manipulation and analysis of numerical data or observable facts and results in informed conclusions). The student will demonstrate the ability to use appropriate mathematical techniques and concepts to obtain quantitative solutions to problems in physics.