Instructor: Dr. Richard Batman, Ph.D.
Office: RBN 4045
Phone: (903) 566-7477 (I prefer email to phone calls.)
Email: rbatman@uttyler.edu (Please do not attempt to contact me through the Canvas system, because this may not work. You must send emails directly to rbatman@uttyler.edu.)

Office Hours: MW (11:00-12:00), Tu (12:00-1:00), Th (2:00-3:00), F (10:00-11:00), or by appointment. (Times are approximate.) Please stop by my office anytime you have questions. Whenever I’m in my office, and the door is open, feel free to walk in, even outside of office hours. I’ll almost certainly be available and happy to help.

Textbooks: College Physics: a Strategic Approach, 2nd ed., Knight, Jones, and Field, ISBN 978-0-321-59549-2. In addition to buying this book, each student must pay to register for the MasteringPhysics online homework website at www.masteringphysics.com, using course I.D. MPBATMANCP1FALL17. MasteringPhysics will give you the option of buying an electronic version of the textbook. When last checked, the price of MasteringPhysics plus the etext was $110.55, and the price of MasteringPhysics without the etext was $66.00. You are required to bring to each lecture and lab session the textbook and a scientific calculator that has no graphing or equation solving capability. If you do not have such a calculator, you are required to buy one. You may not use a calculator with graphing or equation solving capability on any quiz or exam. A non-exhaustive list of examples of prohibited calculators is given on the last page of the syllabus.

Prerequisite: MATH 2312 (Precalculus).

Course Topics:
This course will stress the application of physical concepts and principles to solving elementary physics problems. It is intended to develop the problem-solving skills that are necessary for success in advanced courses or standardized exams in physics. Major topics covered will include kinematics, Newton’s laws, energy, momentum, rotational motion, and gravity.
Math Background Requirements:
Precalculus is a prerequisite for this course. Students should be familiar with graph interpretation, algebra, and properties of elementary functions, especially trigonometric functions (sine, cosine, tangent), exponential functions \(e^x\) and logarithms \(\log(x)\) or \(\ln(x)\). However, trigonometry (and perhaps other math concepts) will be reviewed in class as needed. If you feel uncomfortable with any of the math discussed, please let me know immediately.

Communication Policy:
All students are required to check their university email (Patriot) accounts frequently for information and notifications that might need to be sent out 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 and bring with you 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 consist of online problems (administered by the MasteringPhysics website at www.masteringphysics.com). Assignment #1 in MasteringPhysics (“Introduction to MasteringPhysics”) WILL affect your grade and must be completed by the deadline.
2. The only way to learn physics is to spend a lot of time solving homework problems. Since physics generally builds on what came before, it is essential not to get behind in the homework. Remember that homework is 20% of your grade!
3. Here are some tips for making homework a learning experience:
   (a) Don’t get solutions online. You won’t have internet access during a quiz or exam.
   (b) Be present for each lecture, and take careful notes. One of the main purposes of lecture is to prepare students to solve homework problems. If you don’t immediately know how to solve a homework problem, look back through your lecture notes for the corresponding section in the textbook/PowerPoint to recall the method that was presented in class for solving this particular type of problem.
   (c) If you can’t find the correct method of solution in your lecture notes, contact me by email or office visit to get help well in advance of the deadline for the assignment.
4. Whenever possible, all work must be shown in any exam or group problem, and you must draw a box around your final result. The burden of proof is upon you to show that you understand what you’re doing. Even a problem with an incorrect result can earn significant credit if some work is shown, but a correct answer with insufficient demonstration of understanding will earn little or no credit. You should never leave any problem blank. Anything that you write could score points.
Format for showing work:
(a) Show the relevant equation in symbolic form (no numbers plugged in yet).
(b) Show the equation, still in symbolic form, solved for the variable of interest.
(c) Show numbers plugged into the equation.
(d) Show the numerical result, including units, and draw a box around it.
5. Tips for studying for exams:
   (a) Don’t waste your time memorizing equations. You’ll be given all the equations you need (and several you don’t need) on exams and quizzes.
   (b) Sets of review and practice problems will be posted prior to every exam. The only effective way to study for an exam is to solve as many of these problems as possible prior to the exam. Simply reviewing solutions to problems that have already been solved for you will not give you the necessary practice. You must apply the methods taught in class to several problems you’ve never seen before.
   (c) Start working on review and practice problems well before the exam date. If you can’t get the correct answer for a particular problem, contact me immediately.

6. Tentative dates of exams are noted in the “Tentative Semester Schedule” later in this syllabus. They will include any material we have covered up to that point, including problems worked in class or given as homework or in quizzes. Midterm exams will be semi-cumulative, in the sense that they will focus on material covered since the last midterm, but will also necessarily include material that came before. The final exam will be fully cumulative and will cover the entire semester.

7. Remember that homework and quizzes are worth 20% and 16% of your final grade, respectively, so doing well on exams will not necessarily ensure a passing final grade. You must also be diligent in successfully completing homework and quizzes.

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 it will be given. To have a chance of getting an extension for a given assignment, you must notify me by email of your situation within one week after the submission deadline. 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, quizzes, and group problems, 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 will be excused. For anticipated excused absences, you must make arrangements before you leave to make up the assignment. For unanticipated excused absences in which an exam, quiz, or group problem is missed, it is your responsibility to come to me to make up the assignment. I will not remind you. Failing to contact me by email about a make-up within one week after a missed exam, quiz, or group problem is grounds for denying the make-up. No more than two exams (including the final) can be made up during the semester, and no more than three quizzes. Remember that quizzes are worth 16% of your 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 grades are due for the end of the semester.

Graded Work and Assessments:
1. 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).
2. Please look over your returned exams and quizzes and ask questions about your grades during my office hours (not during class) if you think there’s a grading error, or if you don’t understand what you did wrong.

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Student Academic Conduct:
Students are encouraged to work in groups when doing homework or preparing for quizzes and exams. However, during quizzes and exams, students are to work alone and not help each other 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 College Physics, 2nd ed., Knight, Jones, and Field.

| Week 1          | Aug 28: Introduction to the course. |
|                | Aug 30: Motion diagrams; definitions of position, displacement, time, average speed, and average velocity. (1.1 – 1.3) |
|                | Sept 1: Significant figures; scientific notation; units; unit conversions; introduction to graphical addition and trigonometric analysis of vectors (1.4 – 1.5) |
| Week 2          | Sept 4: No class for Labor Day. |
|                | Sept 6: Motion graphs; equations of uniform motion; definitions of instantaneous velocity and acceleration. (2.1 – 2.4) |
|                | Sept 8: Quiz 1. Uniformly accelerated motion and 1-D kinematics. (2.5 – 2.6) |
| Week 3 | Sept 11: Free-fall (2.7)  
Sept 13: Exam 1 Review.  
Sept 15: Exam 1. |
|--------|--------------------------------------------------|
| Week 4 | Sept 18: Graphical addition, scalar multiplication, and subtraction of vectors; vectors on motion diagrams (3.1 – 3.2)  
Sept 20: Quiz 2. Decomposing vectors into components; algebraic addition and subtraction of vectors; motion on a ramp. (3.3 – 3.4)  
Sept 22: Relative motion in 1-D and 2-D; projectile motion. (3.6) |
| Week 5 | Sept 25: Solving projectile motion problems (3.7)  
Sept 27: Exam 2 Review.  
Sept 29: Exam 2. |
| Week 6 | Oct 2: More projectile motion problems; uniform circular motion; centripetal acceleration. (3.7 – 3.8)  
Oct 4: Newton’s first law and the definition of force; net force; conceptual introductions to weight, spring force, tension, normal force, friction, drag, and thrust; identifying forces. (4.1 – 4.4)  
Oct 6: Quiz 3. Newton’s second law; free-body diagrams; the third law. (4.5 – 4.8) |
| Week 7 | Oct 9: Equilibrium; dynamics. (5.1 – 5.2)  
Oct 11: Mass and weight; apparent weight; weightlessness. (5.3)  
Oct 13: Quiz 4. Normal force; static and kinetic friction. (5.4 – 5.5) |
| Week 8 | Oct 16: Objects in contact. (5.7)  
Oct 18: Exam 3 Review.  
Oct 20: Exam 3. |
| Week 9 | Oct 23: Ropes and pulleys. (5.8)  
Oct 25: Angular position, angular velocity, and their graphs; speed, velocity, and acceleration in uniform circular motion. (6.1 – 6.2)  
Oct 27: Quiz 5. Dynamics of uniform circular motion; apparent forces. (6.3 – 6.4) |
| Week 10 | Oct 30: Circular orbits, weightlessness; Newton’s law of gravity, orbits. (6.5 – 6.7)  
Nov 1: Rotational motion of a rigid body; angular acceleration; rotational kinematics; tangential acceleration. (7.1)  
Nov 3: Quiz 6. Torque; center of gravity; gravitational torque. (7.2 – 7.3) |
| Week 11 | Nov 6: Rotational dynamics and moment of inertia; Newton’s second law for rotation. (7.4 – 7.5)  
Nov 8: Exam 4 Review.  
Nov 10: Exam 4. |
| Week 12 | Nov 13: Torque and static equilibrium (8.1)  
Nov 15: Stability and balance; springs; Hooke’s law; stretching/compressing materials. (8.2 – 8.4)  
Nov 17: Impulse and the force curve; the impulse-momentum theorem. (9.1 – 9.3) |
| Week 13 | Nov 20: No class for Thanksgiving.  
Nov 22: No class for Thanksgiving.  
Nov 24: No class for Thanksgiving. |
### Week 14
- **Nov 27**: Quiz 7. Momentum conservation; inelastic collisions; explosions. (9.4 – 9.5)
- **Nov 29**: Collisions in 2-D; conservation of angular momentum. (9.6 – 9.7)
- **Dec 1**: Energy transfers and transformations; work; zero-work forces; kinetic energy (translational and rotational). (10.1 – 10.3)

### Week 15
- **Dec 4**: Quiz 8. Gravitational potential energy; elastic potential energy; thermal energy and friction; conservation of mechanical energy. (10.4 – 10.6)
- **Dec 6**: Conservation of energy with friction; elastic collisions; power. (10.6 – 10.8)
- **Dec 8**: Final Exam Review.

### Week 16
- **Dec 11**: No class for Study Day.
- **Dec 13**: TBA
- **Dec 15**: TBA

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**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](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](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. (For Fall, the Census Date is Sept. 12.) Grade Replacement Contracts are available in the Enrollment Services Center or at...
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 (Sept. 12th) 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.

UT Tyler Resources for Students
• UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
• UT Tyler Tutoring Center (903.565.5964), 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)

A more complete description of university policies is given at the following website: http://www.uttyler.edu/academicaffairs/files/syllabuspolicy.pdf.

The census date, which is the last day to drop without a W, is Monday, Sept 11.
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. **Communication Skills** (includes effective development, interpretation and expression of ideas through written, oral and visual communication). Students will communicate an understanding of the physics principles covered in class on free response essay questions. The questions will require the students to express a qualitative understanding through written communication of the concepts covered in class.

3. **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.

4. **Teamwork** (includes the ability to consider different points of view and to work effectively with others to support a shared purpose or goal). Students will demonstrate teamwork by working on group problems given throughout the semester. The students will be given a physical situation that they have to evaluate and work together on to arrive at a solution.

Non-Exhaustive List of Examples of Prohibited Calculators:

- **TI:** All model no’s that begin with TI-83, TI-89, or TI-92; TI-Nspire CAS.
- **HP:** HP Prime; HP 48GII; all model no’s beginning with HP 40G, HP 49G, or HP 50G.
- **Casio:** fx-CP 400 (ClassPad 400); ClassPad 300; ClassPad 330, Algebra fx 2.0; all model no’s that begin with CFX-9970G.

*Any calculator with a QWERTY keyboard is also prohibited.*

Online Physics Resources:

3. [http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html](http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html)
13. [http://galileo.phys.virginia.edu/classes/109N/more_stuff/Applets/home.html](http://galileo.phys.virginia.edu/classes/109N/more_stuff/Applets/home.html)
14. [http://webphysics.davidson.edu/Applets/Applets.html](http://webphysics.davidson.edu/Applets/Applets.html)