

Physics 2425-A3
Physics for Engineers I
Blinn College – Bryan Campus
Fall 2010

Course Syllabus

Instructor: Dr. Terry Honan **Homepage:** <http://www.blinn.edu/brazos/natscience/thonan>
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Tel: (979) 209-7420 **Office Hours:** MW 9:30-11:30, 1:30-2:30,
TR 9:30-11:00, 3-4,
F 10-11:45

Course Description: A course primarily designed for students majoring in engineering and physical sciences. Topics covered include classical mechanics, heat and waves.

Prerequisite: MATH 2413 or continuing enrollment therein.

Core Curriculum Course: This is a course in the 42-hour Core Curriculum of Blinn College. As such, students will develop proficiency in appropriate intellectual competencies, exemplary educational objectives and general perspectives. The URL of the Blinn College core curriculum web site is: <http://www.blinn.edu/corecurriculum.htm>

Course Objectives and Student Learning Outcomes:

Upon completing this course students should have a grasp of the listed concepts and be able to solve problems using calculus and these physics concepts. Lecture and laboratory work will focus on the following learning outcomes:

- Solve problems in 1D and 2D kinematics.
- Use vectors in solving physics problems.
- Apply Newton's laws of motion to problems involving the one- and two-dimensional linear dynamics of particles.
- Utilize the definitions of work and potential energy, the work-energy theorem and the principle of conservation of energy in solving physics problems.
- Apply Newton's laws to systems of particles and use the principle of conservation of linear momentum.
- For rotations of a rigid body about a fixed axis, use the equations of kinematics, calculate moments of inertia and apply energy considerations.
- Apply the equations of rotational dynamics, including the principle of conservation of angular momentum.
- Utilize principles such as Newton's law of universal gravitation, conservation of energy or Kepler's laws to solve problems in gravitation.
- Solve problems involving oscillations and waves.
- Solve problems involving temperature, including temperature scales, thermal expansion and the ideal gas law.
- Apply the concepts of specific heat and latent heat to problem solving.
- Apply the first and second laws of thermodynamics.

By the end of the course the student will maintain a minimum grade of **D** (60%) for completion of the course. This grade will include both lecture and laboratory components. Laboratory work will be chosen to reinforce the above lecture topics. The student will demonstrate in the laboratory an understanding of the experiment through writing a report that analyzes the data and interprets the results.

Textbooks and other materials:

- **Required Textbook:** Young and Freedman, University Physics, 12th edition.
- **Required Homework System:** Students must purchase an access key to Mastering Physics, the textbook publisher's online homework system. This is bundled with the textbook at the Blinn bookstore. Alternatively, the access key can be purchased online at <http://www.masteringphysics.com/>. Be sure to select the textbook above (with proper edition) to pair with the Mastering Physics. The Mastering Physics Course ID for this section is: BLINN2425A3FA10 .
- **Required Laboratory Manual:** Each student *must* print out a copy of the labs for the semester. It is in the form of a single pdf file and can be found [here](#).
- **Scientific Calculator:** Students must have a proper scientific calculator with them for every class.
- **Web resources:** [Lecture notes](#), [problems with solutions](#), [labs](#), the [exam formula list](#) and [previous exams with answers](#).

Course Content and Approximate Schedule:

Chapter from Lecture Notes	Textbook Chapter	Approx. Time
Units and Dimensions	1.1-1.6	½ Week
One Dimensional Kinematics	2	1 Week
Vectors and Two Dimensional Kinematics	1.7-1.9, 3 excluding 3.4	1½ Weeks
Newton's Laws and Applications	4, 5.1-5.3	1 Week
Circular Motion and More Applications	3.4, 5.4, 5.5	1 Week
Work and Energy	1.10 (Scal. Prod.), 6, 7	1½ Weeks
Momentum and Systems of Particles	8	1 Week
Rotational Motion and Equilibrium	9, 1.10 (Vec. Prod.), 10, 11.1-11.3	2 Weeks
Universal Gravitation	12	1 Week
Oscillatory Motion	13.1-13.6	½ Week
Waves	15	½ Week
Temperature and Heat	17	1 Week
Ideal Gases and the First Law of Thermo.	18.1, 18.2, 19.1-19.5	1 Week
Entropy and the Second Law of Thermo.	20	½ Week

College Civility Policy:

- **Civility Statement:** Members of the Blinn College community, which includes faculty, staff and students, are expected to act honestly and responsibly in all aspects of campus life. Blinn College holds all members accountable for their actions and words. Therefore, all members should commit themselves to behave in a manner that recognizes personal respect and demonstrates concern for the personal dignity, rights, and freedoms of every member of the College community, including respect for College property and the physical and intellectual property of others.
- **Civility Notification Statement:** If a student is asked to leave the classroom because of uncivil behavior, the student may not return to that class until he or she arranges a conference with the instructor. It is the student's responsibility to arrange for this conference.

Course Requirements and Criteria for Grading:

There will be three major exams, several unannounced quizzes, labs, online homework and a cumulative final.

- **Major Exams and Final:** The three major exams and final will be closed book/closed note tests. A formula list will be provided; the [exam formula list](#) can be found at the web site. There will be a curve given for each major exam and the final. The curve will be based on

the performance of the class relative to the expectations of the instructor. The curve will be a simple function that converts the raw grade to the standard scale.

- **Quiz:** The quiz grade will consist of 30 point quizzes. There will be no make-up quizzes, for any reason. At least 1/4 of the quiz grades will be dropped. Quizzes will typically be open book / open note. After dropping, all the remaining quiz grades will be added and rescaled to 100 points.
- **Credit for Work:** On the major exams, final and all quizzes, all work must be shown and clearly documented for any show-your-work problem. The starting point in problem solving *must* be some expression on the official [exam formula list](#) for the class. Memorized intermediate expressions will receive no credit unless their derivation is included.
- **Labs:** Labs will be held without being previously scheduled. There will be no make-up labs, for any reason. Only students who attend laboratory may get credit for the lab. At least 1/4 of the lab grades will be dropped.
- **Online Homework:** We will use the textbook publisher's online homework system. Each assignment will have a due date. One assignment will be dropped, the one that gives the student the maximum benefit. The final point total for the semester will be rescaled to 100 points.
- **Exam Schedule:** The order of the chapters is shown at the web site under the [Lecture notes](#) section. The test dates, shown below, will be rigidly held to.

Test 1	Tuesday, September 28
Test 2	Tuesday, October 26
Last day to drop with a W	Friday, November 19
Test 3	Tuesday, November 23
Final	Tuesday, December 14, 12:45-2:45

- **Calculation of Final Grade:** There will be 3 major exams, each worth 16%. The quiz grade, the lab grade and the homework grade are each 10%. The remaining 22% is the final. An alternative method is provided to partially alleviate a poor performance on one major exam; half of the lowest (curved) exam grade is replaced with the curved final exam grade. The final average is calculated both ways; the grade will be the higher of the two.

	Normal	Alternative	Final Grade Calculation	
Three Major Exams	16% ×3	16% ×2 + 8%	A	90 – 100%
Quiz	10%	10%	B	80 – 89%
Labs	10%	10%	C	70 – 79%
Online Homework	10%	10%	D	60 – 69%
Final Exam	22%	30%	F	≤ 59%

College and Class Policies:

- **Attendance:** The College District believes that class attendance is essential for student success; therefore, students are required to promptly and regularly attend all their classes. Each class meeting builds the foundation for subsequent class meetings. Without full participation and regular class attendance, students shall find themselves at a severe disadvantage for achieving success in college. Class participation shall constitute at least ten percent of the final course grade. It is the responsibility of each faculty member, in consultation with the division chair, to determine how participation is achieved in his or her class. Faculty will require students to attend class regularly and will keep a record of attendance from the first day of class or the first day the student's name appears on the roster through final examinations. If a student accumulates one week's worth of unexcused absences during the semester, he or she will be sent an e-mail by the College requiring the student to contact his or her instructor and schedule a conference immediately to discuss his or her attendance issues. **Should the student accumulate**

two weeks' worth of unexcused absences he or she will be administratively withdrawn from class.

There are four forms of excused absence officially designated by Blinn College: (1) Observance of religious holy days: The student should notify his/her instructor(s) not later than the 15th day of the semester concerning the specific date(s) that the student will be absent for any religious holy day(s); and (2) Representing Blinn College at an official institutional function and (3) official involvement in a high school activity for "dual credit" students; and (4) military service. Other excuses will be considered and may be considered excusable at the instructor's discretion, with documentation. **Missing lecture or lab or both will count as one absence.** For classes that meet twice a week in the Fall and Spring semesters, two absences counts as a week and four is the threshold for being dropped.

- **Dropping:** If a student chooses to drop the course, it is that student's responsibility to complete a drop order at the Office of Enrollment Services. Failure to do so could result in a grade of F in the course.
- **Student E-mails:** Students are assigned an E-mail address that must be checked regularly for official Blinn communications and course information. The address is of the form: *Firstname.LastnameLast2digitsBlinnID@buc.blinn.edu* . Information about accessing this account can be found at: www.blinn.edu/acadtech/studentemail/ .
- **Eating and drinking** are not allowed during class or laboratory work.
- **Cell phones and Electronic Devices:** Cell phones and all electronic devices are to be turned off when in the classroom. It is never acceptable to leave a class to answer a cell phone. Texting during class is totally unacceptable. Any use of a cell phone or other wireless device during an exam will be considered a major incident of scholastic dishonesty.
- **Dishonesty Statement:** Blinn College does not tolerate cheating, plagiarism or other acts of dishonesty. Definitions of these acts and procedures for dealing with them are described in "Scholastic Dishonesty" in the Blinn College Student Handbook, copies of which are available at the information desk in the administration building.
- **Problem Resolution:** If you have a complaint about your class, you should first request a conference with your instructor to try and resolve the problems or issues. If the problems or issues cannot be resolved at the instructor level, you should request a conference with the Division Chair, Mr. Dwight Bohlmeier, Science 241, dbohlmeier@blinn.edu.
- **ADA Policy:** Reasonable accommodations for students with documented learning or physical disabilities will be made upon presentation of a formal request by the student. An official request form is supplied and completed by the Office of Disability Services (ODS) located in the College Park Center Administration Building. The URL to the Office of Disability Services webpage is <http://www.blinn.edu/disability.htm>. Accommodation is not retroactive from the time of concluding agreement for accommodation.