

Texas A&M University – Texarkana
PHYS 2325 - University Physics I Course Syllabus
Spring 2015

- I. Course Number:** PHYS 2325
- II. Course Title:** University Physics I
- III. Semester Credit Hours:** 3 credit hrs (3 contact hrs)

Instructor: Dr. Yi Su
Office: SCIT 318C, Hours: M.W 4:30-5:30PM; T.R. 2:30-3:30PM
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- IV. Course Description:** Fundamental principles of physics, using calculus, for science, computer science, and engineering majors; the principles and applications of classical mechanics, including harmonic motion, physical systems, and thermodynamics; and emphasis on problem solving. Co-requisites: PHYS 2125 - University Physics I Lab and MATH 2413 - Calculus I
- V. Course Delivery Method:** Face to face.
- VI. Required Textbooks/Resources:** Physics for Scientists and Engineers, 4th Edition (2008), Volume 1, Douglas C. Giancoli, Pearson, Prentice Hall, ISBN-10: 0132273586

A scientific calculator will be needed for this course. (The library will have some calculators available for use on a first-come, first-served basis.)

- VII. Student Learning Outcomes: The Texas Higher Education Coordinating Board adopted Exemplary Educational Objectives (EEOs) to establish a common knowledge thread through the courses taught within the Texas Core Curriculum. The Natural Sciences EEOs are integrated into the Student Learner Outcomes below:**
- To understand and apply method and appropriate technology to the study of natural sciences. (EEO 1)
 - To recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry and to communicate findings, analyses, and interpretation both orally and in writing. (EEO 2)
 - To identify and recognize the differences among competing scientific theories. (EEO 3)
 - To demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies. (EEO 4)
 - To demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture. (EEO 5)

Upon successful completion of this course, students will:

Course Objectives	EEO	ABET	Assessment
1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.	1, 5	a, b, d, e, g, j, k	Quizzes, Exams, Final Exam, Labs
2. Solve problems involving forces and work applying Newton's laws to physical problems.	1, 5	a, b, d, e, g, j, k	Quizzes, Exams, Final Exam, Labs
3. Identify the different types of energy and solve problems using principles of conservation of energy.	1, 4, 5	a, b, d, e, g, j, k	Quizzes, Exams, Final Exam, Labs
4. Apply the principles of impulse, momentum, and collisions to solve problems.	1	a, b, e, j	Quizzes, Exams, Final Exam, Labs
5. Determine the location of the center of mass and center of rotation for rigid bodies in motion and solve problems involving rotational and linear motion.	1	a, b, d, e, g, j	Quizzes, Exams, Final Exam, Labs
6. Describe simple harmonic motion and its application to real-world problems.	1, 2, 5	a, b, d, e, g, j, k	Quizzes, Exams, Final Exam, Labs
7. Solve problems involving the fluid mechanics and the First and Second Laws of Thermodynamics.	1, 2, 5	a, b, d, e, g, j, k	Quizzes, Exams, Final Exam, Labs

This course is designed to satisfy the ABET Engineering Competencies specified in the table above. Engineering programs must demonstrate that their graduates have:

- a. an ability to apply knowledge of mathematics, science, and engineering
- b. an ability to design and conduct experiments, as well as to analyze and interpret data
- c. an ability to design a system, component, or process to meet desired needs
- d. an ability to function on multi-disciplinary teams
- e. an ability to identify, formulate, and solve engineering problems
- f. an understanding of professional and ethical responsibility
- g. an ability to communicate effectively
- h. the broad education necessary to understand impact of engineering solutions in global and societal context
- i. a recognition of the need for, and an ability to engage in life-long learning
- j. a knowledge of contemporary issues
- k. an ability to use techniques, skills, and modern engineering tools necessary for engineering practice

Student Learning Outcomes Measured/Demonstrated by:

By the end of the course, 75% of all students should demonstrate an average or better mastery of the subject matter. Students will demonstrate successful outcomes by earning a 70% or higher on 10 of 11 quizzes, two midterm exams and a comprehensive final exam.

VIII. Course Outline and Schedule:

Chap.	Title	Week	Exam Date*
0	Introduction to University Physics I	1	
1	Introduction, Measurement, Estimating	1	
2	Describing Motion: Kinematics in One Dimension	2	
3	Kinematics in Two or Three Dimensions; Vectors	3	
4	Dynamics: Newton's Laws of Motion	4	
5	Using Newton's Laws: Friction, Circular Motion, Drag	5	
6	Gravitation and Newton's Synthesis	5	
	Exam I	6	TBD
7	Work and Energy	7	
8	Conservation of Energy	7	
	<i>Spring Break</i>		
9	Linear Momentum	8	
10	Rotational Motion	8	
11	Angular Momentum; General Rotation	9	
12	Static Equilibrium; Elasticity and Fracture	9	
14	Oscillations	10	
15	Wave Motion	10	
16	Sound	10	
	Exam II	11	TBD
13	Fluids	12	
17	Temperature, Thermal Expansion and the Ideal Gas Law	13	
18	Kinetic Theory of Gases	13	
19	Heat and the First Law of Thermodynamics	14	
20	The Second Law of Thermodynamics	15	
	Final Exam (Final Exam Review – TBD)	16	TBD

*This calendar will be adjusted to the needs of the course. Changes will be based on the course progress. The in-class exam dates could be moved one or two weeks up or down.

IX. Methods of Evaluation:

Ten Quizzes (8 Count)	20%	200 pts
Two Midterm Tests	50%	500 pts
Comprehensive Final	30%	300 pts
Total	100%	1000 pts possible

The quiz and exam questions will primarily be of multiple-choice, true-false, matching, short answer/essay, and algorithmic types. The rubric below will be utilized in the grading of essay questions.

Essay Grading Rubric

Criteria	Points
The answer demonstrates little or no grasp of the topic. The response: (1) may significantly misstate facts or misinterpret them; (2) may fail to completely justify the choice of factors; (3) may be a string of generalizations without specifics or specifics without generalizations; (4) has structure and mechanics which may cause the reader significant difficulty.	0 - <6
The answer demonstrates only limited understanding or a partial misunderstanding of the topic. The response: (1) may use unimportant factors or may explain important factors or their significance with little coherence or specificity; (2) may make a number of serious factual errors; (3) has structure and mechanics which sometime impede the reader's understanding.	6
The answer demonstrates an acceptable but commonplace understanding of the topic. The response: (1) presents important factors but explains them with only the most obvious specifics; (2) delineates only the most obvious implications; (3) has structure and mechanics which may cause the reader minor distractions.	7
The answer demonstrates an accurate grasp of the topic. The response: (1) presents important factors and explains them with appropriate specifics; (2) shows less detailed knowledge and less synthesis than the A response; (3) has structure and mechanics which usually serve content.	8
The answer shows a superior understanding of the topic. The written response: (1) presents factors of central significance and explains them with substantial factual detail; (2) clearly shows how these factors operate; (3) has structure and mechanics which serve content.	9 – 10

X. Grading Scale:

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

XI. Library/Media Resources Assessment:

A. Books/Periodicals/Electronic Data Bases/Software/Programs:

Resource	Available?		If "No," Est.Cost	Signature, Library Director	Comments (including availability of funds to acquire unavailable resource(s) and commitment to do so)
	Yes	No			
Basic physics for all / B.N. Kumar. Lanham, Md. : University Press of America, c2009.	X				
College physics / Jerry D. Wilson, Anthony J. Buffa, Bo Lou. Upper Saddle River, N.J. : Pearson Education, 2007.	X				
Introduction to Modern Physics: Theoretical Foundations / John Dirk Walecka. New Jersey : World Scientific, c2008.	X				

B. Computing/Multimedia/Online Media Resources:

Resource	Available?		If "No," Est.Cost	Signature, Assoc. VP, IT	Comments (including availability of funds to acquire unavailable resource(s) and commitment to do so)
	Yes	No			
Applied physics [electronic resource] / by Arthur Beiser ; abridgement editor, George J. Hademenos. New York : McGraw-Hill, 2003	X				

XII. Student Participation:

- a. **Participation Policy:** You are expected to attend all lecture classes. Class attendance is very important since many of the exam questions will be drawn from the class lectures, demonstrations, and discussions. Taking good class notes is essential. Reading the chapter prior to coming to class is also recommended. You are expected to participate in all team project exercises.
- b. **Course Etiquette:** You are expected to be courteous towards the instructor and your classmates. You are expected to be on time for lecture. Cell phones should be turned off during lecture. You should not talk to your classmates while I am talking or while one of your classmates is asking a question.
- c. **Discussion Board Standards:** Not applicable to this course.

XIII. Disability Accommodations: Students with disabilities may request reasonable accommodations through the A&M-Texas Disability Services Office by calling 903-223-3062.

XIV. Academic Integrity: Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

XV. A&M-Texarkana Email Address: Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

XVI. Drop Policy To drop this course after the census date (see [semester calendar](#)), a student must complete the Drop/Withdrawal Request Form, located on the University website <http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html>) or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email Registrar@tamut.edu, mail (7101 University Ave., Texarkana, TX 75503) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

XVII. Student Technical Assistance:

- Solutions to common problems and FAQ's for your web-enhanced and online courses are found at this link: <http://www.tamut.edu/webcourses/index.php?pageid=37>
- If you cannot find your resolution there, you can send in a support request detailing your specific problem here: <http://www.tamut.edu/webcourses/gethelp2.php>
- Blackboard Helpdesk contacts:

Office hours are: Monday - Friday, 8:00a to 5:00p

Julia Allen (main contact) 903-223-3154 julia.allen@tamut.edu

Frank Miller (alternate) 903-223-3156 frank.miller@tamut.edu

Nikki Thomson (alternate) 903-223-3083 nikki.thomson@tamut.edu

XVIII. Additional Notes: The instructor reserves the right to modify this syllabus at any time as deemed necessary. Any modifications will be announced as soon as possible. The faculty of the College of Science, Technology, Engineering, and Mathematics is committed to the continuous improvement in the quality of instruction. Student input is important and will be obtained at the end of the course.