

# COURSE SYLLABUS

## PHY1305, ON-LINE COURSE

### Classical Physics and Thermodynamics

### 3 CREDIT HOURS

### SPRING 2017

#### 1. LOCATION OF CLASS MEETING

None – on-line class

#### 2. CLASS MEETING TIMES

THIS IS AN ON-LINE CLASS THERE IS NOT AN ASSIGNED CLASS TIME.

#### 3. INSTRUCTOR

The instructor for this class is Dr. Charles R. Meitzler

#### 4. OFFICE LOCATION

313 Farrington Bldg., Physics Dept., Sam Houston State University, Huntsville, TX, 77341.

#### 5. INSTRUCTOR CONTACT INFORMATION

The instructor may be contacted in one of several ways:

- 1) Phone 936.294.1606 – Please leave a message and I will call back. Leave a time that I can return your call. Depending on your requested callback time, the phone number will come up as a Skype phone number from California.
- 2) E-mail: [crmeitzler@shsu.edu](mailto:crmeitzler@shsu.edu) – I check my e-mail at roughly 6:00, 12:00 and 18:00 on weekdays. Weekends have a more restricted schedule.

The following rules apply for e-mail correspondence.

**Please state which course you are taking so that I can respond in a timely manner.** E-mail without a course number will be answered with a message asking for which course you are taking.

**You must use your SHSU e-mail account when corresponding with me.** This is so that I can identify you when you forget to include your name. (I have no way of knowing who SHSU389@obscureisp.co.uk is!)

**If you are asking about a specific question on a quiz, please include the topic and text of the question.** (The quizzes are generated by a random generator and any two quizzes will have different questions and numbers!)

## 6. COMPUTER HELP

If you have computer problems or technical problems with the Blackboard software please contact the Delta Center Help Desk at 936.294.2780. They are available Monday through Saturday during the hours of 7:00 to Midnight. **DO NOT CALL THE SAM HOUSTON HELP DESK BECAUSE THEY CAN'T HELP YOU!**

Be aware that the instructor has limited ability to solve your computer problems. If you do decide to write to me about a computer problem you are having, you need to include the following information so that I can ask the Delta Center Help desk:

- 1) Computer Manufacturer
- 2) Operating System and version
- 3) Browser and version information
- 4) Any peripheral hardware you are using.

## 7. OFFICE HOURS

The office hours for this course are quite open because of the fact that communication will be primarily via e-mail over the Internet. E-mail is generally checked at approximately 6:00 in the morning, noon, and 18:00 in the evening.

It is also possible to set up Skype sessions if needed. My Skype username is dr\_m\_shsu\_physics.

## 8. COURSE DESCRIPTION

This course is described in the Catalog as:

**[PHYS 1305] General Physics for Non-Science Majors.**

This course is for liberal arts students. It is NOT open to students majoring in programs offered by Chemistry, Physics, Biological Sciences, Geology, or Mathematics. Concepts and principles are stressed. No Mathematics or Physics prerequisites..

There will be some mathematical and numerical work associated with this course but nothing exceeding simple high-school algebra and arithmetic operations on a calculator.

You should be aware before attempting this course that on-line courses require a tremendous amount of self-discipline to complete the work in a timely manner. You will need to devote roughly 12 hours each week to working on this course during the Fall Semester. You are encouraged to immediately contact me by e-mail whenever you have a problem with either material or meeting a deadline.

## 9. COURSE OBJECTIVES

This course is a conceptual introduction to the science of physics, particularly the area known as classical physics. An understanding of the principles is required with the ability to perform simple calculations.

The student should be able to do the following to successfully complete this course:

- 1) Gain an understanding of nature and goal of physics. Understand how physics is split into a number of sub-fields.
- 2) Understand the three basic unit systems in use: the MKS (Meter, Kilogram, Second), CGS (Centimeter, Gram, Second), and English Engineering (aka American Customary) system.
- 3) Understand how to describe motion (Kinematics); in particular, understand and use the concepts of position, displacement, velocity, and acceleration to describe the motion of objects in the world around you. Be able to perform simple calculations involving those quantities.
- 4) Understand the history and role that free-fall and projectile motion play in the development of physical theory and science in general.
- 5) Be able to state and understand Newton's Three Laws of Motion (Dynamics). Be able to perform conceptual analyses of the forces acting on moving bodies. Be able to describe and use simple forces like tension, friction, gravity, and drag to understand and explain how objects move. Understand the difference between mass and weight.
- 6) Understand the role of gravity in physics. Understand and use Newton's Universal Law of Gravitation.
- 7) Understand and use the concepts of centripetal acceleration and force.
- 8) Understand Kepler's Laws of Planetary motion. Be able to understand how Newton's Law of Gravitation and Kepler's Laws predicted the possibility of artificial satellites.
- 9) Understand the concepts of Work and Energy. Understand kinetic, potential, and total mechanical energies. Understand and be able to use the Work-Energy Theorem to describe how the motion of objects changes.
- 10) Understand the principle of Conservation of Energy. Understand when this conservation law is applicable. Use Conservation of Energy to describe the motion of objects.
- 11) Understand the definition of momentum. Understand the concept of Impulse. Be able to use the Momentum-Impulse Theorem to describe how forces acting for periods of time can change the momentum of an object.
- 12) Understand and be able to use the concept of Conservation of Momentum. Understand when this conservation law is applicable.
- 13) Understand the three types of simple, binary collisions.
- 14) Understand the kinematics of rotating solids. Be able to identify the similarities of rotational kinematics to linear kinematics. Understand how the Rotational Inertia is related to the mass in linear inertia.
- 15) Understand the three common temperature scales: Celsius, Fahrenheit, and Kelvin. Be able to convert between them.
- 16) Know and understand the concepts of heat, internal energy, and work done by a system. Be able to perform simple calculations using these concepts.
- 17) Know the Laws of Thermodynamics. Understand their physical origins. Be able to perform simple calculation with these laws.
- 18) Understand the concept of Entropy.
- 19) Understand how heat engines and refrigerators operate. Understand the concept of thermodynamic efficiency. Understand why the Carnot cycle is the most efficient cycle. Perform simple calculations of the heat flow and work in heat engines and refrigerators.

## 10. REQUIRED TEXTBOOKS

The required book for this class is Louis A. Bloomfield, *How Things Work: The physics of everyday life*, 5<sup>th</sup> ed. (John Wiley & Sons, 2013. ISBN: 978-1118-23776-2) Students are free to choose any other binding option such as loose-leaf, hardcover, or e-book.

Students are required to acquire a copy of the textbook prior to the end of the first week of the course.

## 11. REQUIRED SUPPLIES

The following supplies are required for this course:

- 1) Writing instrument such as a pen or pencil
- 2) Scientific calculator with the following functions: sine, cosine, square root, exponentiation, scientific notation.
- 3) Notebook or ring binder with appropriate paper.
- 4) Textbook
- 5) Access to a computer with internet access with the Firefox browser installed. (Some of the Blackboard software doesn't work well with the Chrome or Safari browsers so it is important to have Firefox installed.)
- 6) A reliable internet connection.

## 12. OPTIONAL TEXTS, REFERENCES, AND SUPPLIES

**None Required.**

Wiley maintains additional on-line material for many of its textbooks at the company's website: <http://www.wileyplus.com> . Students should look there to determine if any of it is useful. Furthermore, Blackboard has a link to the textbook's website.

## 13. ATTENDANCE POLICY

**ATTENDANCE IS NOT USED TO CALCULATE THE FINAL COURSE GRADE BECAUSE THIS IS AN ON-LINE COURSE.**

## 14. ASSIGNMENTS

The course has substantial reading and problem assignments. Each chapter has assigned readings, occasional video tutorials, and problem sets. This is a self-guided course so you need to ensure that you complete all of the items in the chapter headings.

Course key: xyzzy

***You should anticipate spending a minimum of 150 hours to pass the course.***

## 15. HOMEWORK GRADES

***HOMEWORK DOES NOT CONTRIBUTE DIRECTLY TO YOUR FINAL GRADE.***

## 16. QUIZZES

An on-line quiz will be taken at the end of each section. These quizzes will be available in each of the chapters in the textbook. You will be able to take the quiz only one time. Quizzes are randomly generated resulting in approximately  $2.4 \times 10^{18}$  different quizzes for each chapter. At the end of the semester an average quiz grade ( $Q_{avg}$ ) will be calculated.

***A SET OF DUE DATES FOR QUIZZES IS SET SO THAT YOU WILL MAKE STEADY PROGRESS THROUGH THE SEMESTER.***

***QUIZZES WILL BE AVAILABLE FOR THREE DAYS AFTER THE DUE DATE.***

***ALL QUIZZES ARE CLOSED BOOK. YOU MAY USE ONE FORMULA SHEET FOR EACH QUIZ.***

***THE RESPONDUS LOCKDOWN BROWSER WILL BE USED TO PROVIDE PROCTORING FOR ALL DISTANCE-LEARNING EXAMS. ITS USE IS MANDATORY.***

## 17. GRADING PLAN

Final letter grades are calculated off-line on a spreadsheet on my computer. The grades in the spreadsheet are the official ones for the course. **BLACKBOARD AVERAGES ARE NOT USED TO CALCULATE FINAL GRADES.**

The final average is a simple un-weighted average of all the quiz grades for the course.

After obtaining the average, letter grades will be assigned according to the following scale:

$$90 \leq A \leq 100$$

$$80 \leq B < 90$$

$$70 \leq C < 80$$

$$60 \leq D < 70$$

$$F < 60$$

***“Curving” may be used only at the end of the course at the instructor’s discretion.***

***Extra Credit is not available for this course.***

Example: Grade calculation method

	Grades	Average
Quizzes	90, 70, 83, 92, 85	$Q_{avg} = (90 + 70 + 83 + 92 + 85)/5 = 84$
	Letter Grade:	B

## 18. University mandated parts of syllabi

**Student Syllabus Guidelines:** You may find on-line a more detailed description of the following policies. These guidelines will also provide you with a link to the specific university policy or procedure:

<http://www.shsu.edu/syllabus/>

**Academic Dishonesty:** Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. *See Student Syllabus Guidelines.*

**Classroom Rules of Conduct:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination. Students may tape record lectures provided they do not disturb other students in the process.

**Student Absences on Religious Holy Days:** Students are allowed to miss class and other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Students remain responsible for all work. *See Student Syllabus Guidelines.*

**STUDENTS WITH DISABILITIES POLICY:** It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail [disability@shsu.edu](mailto:disability@shsu.edu)). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No

accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

<http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf>

**Visitors in the Classroom:** Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.