

SYLLABUS

General Physics – Life Sciences I Phys 2110 Fall 2015

TECHNICAL DETAILS

Instructor: D. Mark Riffe

Office: SER 222B

Phone: 797-3896

Email: mark.riffe@usu.edu

Office Hours: 2:00 – 3:00 pm MWF at the **Quadside Café**; otherwise, an appointment can be made – email is the best way to schedule an appointment.

Prerequisites: Math 1100 or 1210 (Calculus)

Texts: (1) *Physics*, Cutnell and Johnson [6th, 7th, 8th, or 9th edition (hard copy or Kindle version)]
or electronic version (8th edition) available on WebAssign homework site
(<http://www.webassign.net/>)

(2) *Laboratory Manual*, available at the campus bookstore

Credits: 4 semester credit hours

Lecture: MWF, BNR 102, 12:30 – 1:20 pm

Course Website: The official course website is on Canvas, <https://canvas.usu.edu/>. Here you will find **Lecture Notes** and other material related to the course. Check the site frequently for updated information.

Homework Website: <http://www.webassign.net/>

COMPONENTS

There are three scheduled components to the course: lecture, recitation, and laboratory. You must be enrolled in all three components of the course.

I. Lecture

In lecture we focus on the CONCEPTS related to the material. The main purpose of the lectures is to give you a running start on the material, which you will more directly engage as you later study the lectures notes and textbook and work on the homework problems. You will likely get more out of the lecture if you have read over at the lecture notes ahead of time. You may find it helpful to print out the lecture notes and bring them to lecture. EXAMS also happen during scheduled lecture periods.

II. Recitation

During recitation you will (i) work on problems germane to the course, (ii) be able to ask questions about the homework problems, and (iii) review multiple-choice questions similar to those on the exams.

III. Laboratory

In the laboratory you will get HANDS-ON EXPERIENCE with the material being covered in the lecture and recitation periods. Seven two-hour laboratories are scheduled throughout the semester. The labs will focus on DATA COLLECTION and DATA ANALYSIS. There is a \$30.00 lab fee that supports the purchase and maintenance of the equipment you will use. At the end of each lab you will be given a QUIZ on the lab that you have just completed. All labs are expected to be completed on time.

A missed lab can be made up only DURING THE WEEK that it is scheduled, during some other scheduled lab period that has an open slot. Note: there are no labs taught on Friday. In order to make up the lab you must obtain a note from the Physics Department office (SER 250). This note will get you into another lab section that week only.

HOMEWORK

Simply attending lectures is NOT sufficient for learning physics. This is because your active engagement in any lecture is neither sufficiently high nor sufficiently long for you to assimilate the material and then be able to apply it to a variety of situations. Your most active engagement with the material happens as you are doing the homework. Because of this, many experts feel that doing homework is the KEY to learning physics. YOU WILL PROBABLY LEARN THE MATERIAL MOST EFFICIENTLY IF YOU APPROACH THE HOMEWORK ASSIGNMENTS AS YOUR BEST OPPORTUNITY TO INTERNALIZE THE PHYSICS CONCEPTS AND HOW THEY ARE APPLIED.

The homework for this course is administered through an online homework system, known as WebAssign. As soon as possible you must sign up for the homework at the WebAssign website, which is www.webassign.net/. There is a fee of \$44.95 for the online homework. In lieu of the traditional textbook, you may also purchase access to an online version of the textbook for an additional \$44.75. Access to the homework and e-book is only good for one semester.

Instructions for registering for homework:

- (1) Go to the site www.webassign.net/. Click on the link "**I Have a Class Key**".
- (2) Enter the class key **usu 4044 7433**. Click the **Submit** button. If you have correctly entered the class key, the class information

Course: PHYS 2110 Fall 2015
Instructor: D. Mark Riffe
Utah State University, UT

should appear. If so, click the **Yes, this is my class** button.
- (3) On the next webpage leave "I need to create a WebAssign account" selected and click on the **Continue** button.
- (4) Fill in the 7 boxes with the required information. **Important:** For the last box that asks for your **Student ID number**, use your **A-Number, starting with a capital A**. Select **Create my Account**.
- (5) On the next webpage select **Log in now**.
- (6) You should now be at your **Home** page. At this point you can purchase access to the homework and/or the electronic textbook, as described above. You have a brief grace period for using the system without payment, but after that you will need to purchase access to the homework.

I will make every attempt to have homework assignments posted at least one week before they are due. Generally, the assignments are due on **Wednesday mornings at 1:00 am**, with an exception for the last homework assignment, which will be due at 1:00 am on the last day of class. Please feel free to work on the assignments before Tuesday night.

SCHEDULE

Week of	Monday (lecture)	Tuesday (Recitation)	Wednesday (lecture)	Thursday	Friday (lecture)
Aug 31 Lab 1: Data Analysis	Class Overview (syllabus) 1	No recitation	Units and Trig (1.1-1.4) 2		Vectors (1.5-1.8) 3
Sept 7	Labor Day Holiday	HW 1 due W 1:00 am	The language of motion (2.1-2.3) 4		Constant acceleration motion (2.4-2.6) 5
Sept 14 Lab 2: 1D Motion	The graphing of motion (2.7) 6	HW 2 due W 1:00 am	2D motion (3.1-3.3) 7		Newton's 3 laws (4.1-4.5) 8
Sept 21	Physical forces – gravity and contact forces (4.6-4.10) 9	Exam I Review, HW 3 due W 1:00 am	EXAM I Lectures 2-9; Homework 1-3		N's 2nd law: equilibrium (4.11) 10
Sept 28 Lab 3: N's 2 nd Law	N's 2nd law: nonequilibrium (4.12) 11	HW 4 due W 1:00 am	Uniform circular motion (5.1-5.3) 12		Kinetic energy and work (6.1-6.2) 13
Oct 5 Lab 4: Work and Energy	Potential energy and conservative forces (6.3-6.5) 14	HW 5 due W 1:00 am	Applications of WE theorem / power (6.6-6.7) 15		Impulse, momentum, and center-of-mass (7.1, 7.5) 16
Oct 12	Momentum conservation and collisions (7.2-7.4) 17	HW 6 due W 1:00 am	Rotational Kinematics I (8.1-8.3) 18	no class	Fall Break
Oct 19	Rotational Kinematics II (8.4-8.6) 19	Exam II Review, HW 7 due W 1:00 am	EXAM II Lectures 10-19; Homework 4-7		Torque and static equilibrium (9.1-9.3) 20
Oct 26 Lab 5: Rotational Motion	Rotational dynamics I (9.4-9.5) 21	HW 8 due W 1:00 am	Rotational dynamics II (9.5-9.6) 22		Harmonic oscillations (10.1-10.4) 23
Nov 2 Lab 6: Harmonic Oscillations	Damped and driven harmonic oscillations / resonance (10.5-10.6) 24	HW 9 due W 1:00 am	Fluid statics I (11.1-11.3) 25		Fluids statics II (11.4, 11.6) 26
Nov 9	Fluid dynamics I (11.7-11.9) 27	HW 10 due W 1:00 am	Fluid dynamics II (11.10-11.11) 28		Temperature and thermal expansion (12.1-12.5) 29
Nov 16	Temperature, internal energy, and heat (12.6-12.8) 30	Exam III Review, HW 11 due W 1:00 am	EXAM III Lectures 20-28; Homework 8-11		Energy transfer (13.1-13.4) 31
Nov 23	Ideal gas law, kinetic theory (14.1-14.3) 32	HW 12 due W 1:00 am	Thanksgiving Break		Thanksgiving Break
Nov 30	Diffusion (14.4) 33	HW 13 due W 1:00 am	First law / thermodynamic processes (15.1-15.4, 15.6) 34		Thermodynamic processes / P-V diagrams (15.4-15.5) 35
Dec 7 Lab 7: Thermal Equilibrium	Heat engines and the second law (15.7-15.10) 36		Second law and entropy (15.10-15.11) 37		Final Exam Review HW 14 due Saturday 1:00 am

FINAL EXAM

Lectures 29-37
Homework 12-14

Wednesday, December 16, 2015,
11:30 a.m. – 1:20 p.m.

EXAMS

I. Overview

There will be four total exams, three during the semester and one during the final-exam time slot. The fourth exam is not comprehensive. All exams have equal weight.

At each exam you may use the following: (1) a #2 pencil, (2) a calculator, and (3) a 3" × 5" card with anything you want handwritten on it. **The card may NOT be larger than 3" × 5", and whatever is on the card must be handwritten.**

II. Makeup Exam

There are **only** two valid reasons (see below) for rescheduling a makeup exam for one of the first three exams. Documentation must be provided for both reasons. The instructor must be notified **before** any missed exam in order to be able to reschedule that exam.

(1) **Medical.** You may reschedule an exam if you are too sick to take the exam. If you are too sick to take the exam, then you are sick enough to visit the infirmary and obtain a note explaining the extent of your illness. **You must provide the instructor with such a note in order to reschedule an exam for medical reasons.**

(2) **University business.** If you are on travel for university business, then you may reschedule an exam. **Again, you must provide written documentation from the sponsoring organization of your participation in said university business.**

The makeup exam for **any** of the first three exam is a single **comprehensive exam** (covering material on the first three exams). The time and location for the makeup exam will be scheduled after the third exam has taken place.

The final exam must be taken during the scheduled time. The final exam is scheduled for Wednesday, December 16, 2015, 11:30 a.m. – 1:20 p.m.

III. Exam Questions

Each exam will consist of 22 multiple-choice questions. Answers will be submitted using a Scantron sheet. As is the case for the homework questions, exam question will require either qualitative or quantitative answers. The number of questions is chosen as a balance between having a large number (50, say) of very simple questions or a very small amount of rather difficult questions.

Exam questions will be based on the concepts and principles covered in lectures and the assigned readings, which you will have grappled with in doing the homework assignments. They will be similar to the homework problems (both qualitative and quantitative answers), but in general simpler due to the time constraint associated with the exam.

Many of the questions will be variations on questions that you have previously encountered, but some of the question may be substantially different than any problems you have previously

encountered. However, if you have truly internalized the physics concepts, you should be able to answer these questions. That is, TO BE SUCCESSFUL ON THE EXAMS YOU WILL NEED TO BE TO APPLY THE PRINCIPLES TO THE PROBLEMS AT HAND.

IV. Exam Results

I'll make every effort to get the Scantrons submitted in as timely a fashion as possible. Once the scantrons have been submitted, I'll post a copy of the exam on the class website so that you can see which questions you missed (if any).

EXPECTATIONS

I. What to expect from the course

A. Content. This course is a BASIC PHYSICS COURSE. We will start with the fundamentals: MOTION, FORCES, ENERGY, MOMENTUM, ROTATIONAL MOTION, and OSCILLATIONS. We will then study FLUIDS. The end of the course will focus on THERMAL PHYSICS.

B. Level of Difficulty. Although this is a 2000 level course, do not expect it to necessarily be easy. First, there is a lot of material to learn. Second, physics requires you to be able to apply the principles and concepts to a variety of situations. This requires a level of logical thinking that is not required in many disciplines.

C. No Extra Credit. Your grade is based solely on your performance on the homework assignments, lab quizzes, and exams. There is no extra credit.

D. Class Average. Historically the GPA for Phys 2110 is ~ 2.9 (slightly less than a B).

II. What the instructor expects from you

A. Participation. The instructor expects you to participate in all aspects of the course. This includes preparing for and attending the lecture, reading the text, doing the homework, attending recitation, and participating in the laboratories.

B. Effort. The instructor expects you to put in the requisite effort to learn the material in the course so that you are prepared to pass the exams. In addition to the items listed under A. Participation, this includes the steps listed below to get additional help, if needed.

C. Ownership of Learning. The instructor expects you, the student, to take ownership of the learning process. You are ultimately responsible for what you learn.

III. What to expect from the instructor

A. Facilitator. Expect the instructor to be prepared for each lecture, which is where you will be introduced to the different topics in this course. Expect the instructor to answer your questions regarding the material, during class, after class, or during office hours.

B. Evaluator. Expect the instructor to prepare exams that will test you on the material. Do not expect the instructor to be a facilitator during these exams.

NEED HELP?

If you find yourself confused or stuck on a particular topic or are spending an inordinate amount of time on any given homework problem you should try one or more of the following.

- (1) Review the relevant chapter and/or class notes, noting any relevant example problems.
- (2) Talk with other students in your class. Ask them to explain the concepts to you (rather than solving the problem for you).
- (4) Ask questions in recitation if you do not quite get the TA's explanation of a particular problem.
- (5) Seek additional help from the class instructor (Dr. Mark Riffe) or one of the recitation teaching assistants, preferably during designated office hours (or make an appointment). In addition, the Physics Department maintains a help center in **SER 219** that is staffed during much of the business day.

LEARNING ASSESSMENT

The assessment of your learning will be done via the homework assignments, the lab quizzes, and four examinations.

I. Homework Assignments (25% of grade)

Each answer is worth 1 point towards your total homework score. Your raw homework average will be the number of correct answers divided by the total number of answers.

In order to account for the rare homework problem that will not give you credit (when your answer is indeed correct), your raw homework average will be multiplied by 1.05 to produce your final homework average. If that gives you more than 100%, then your final homework average will be set to 100%. For example, if your raw homework average is 85%, then your final homework average will be $85\% \times 1.05 = 89.25\%$. On the other hand, if your raw homework average is 98%, then because $98\% \times 1.05 = 102.9\%$, your final homework average will be set to 100%.

II. Lab Quizzes (10% of grade)

At the end of each lab you will be given a quiz consisting of three multiple-choice questions. In order to take the quiz you will be required to first complete the laboratory. The quizzes serve two purposes: (1) they encourage you to actively participate in the laboratory, and (2) they provided a record of your participation in the laboratory.

Each quiz is worth 5 points: 2 points for taking the exam and 1 point for each correct answer on the quiz. Your quiz average will be the number of quiz points divided by the total number possible, which is 35 points (7 quizzes \times 5 points / quiz)

III. Exams (65% of grade)

The exams will test on material in the **lectures, reading assignments, and homework assignments**. Similar to the homework assignments, the exams will consist of both conceptual and quantitative problems. Example exams will be posted on the class website (Canvas).

There will be four 50 minute exams, 3 during the course of the semester and one during final-exam week at the regularly scheduled final-exam time. All exams have equal weight. **Scantrons** will be provided at the exams.

GRADING BREAKDOWN

The grading scale is not flexible: that is, grading will not be curved. Your course grade will solely depend on how you do relative to the following scale.

A \geq 93%,
A- \geq 90%,
B+ \geq 87%,

B \geq 83%,
B- \geq 80%,
C+ \geq 77%,

C \geq 73%,
C- \geq 70%,
D+ \geq 67%,

D \geq 60%

TOP TEN LIST

The following are the top ten items that will help you succeed in the course.

10. **Start with a positive attitude!**
9. LOOK AT the lecture notes BEFORE the lecture
8. ACTIVELY LISTEN to the lectures
7. READ the textbook soon after the lecture
6. Use the homework as an opportunity to INTERNALIZE the material
5. GO TO recitation
4. Ask Questions / GET HELP when you need it
3. PARTICIPATE in the laboratories
2. Use the writing of your exam NOTE CARD as an opportunity to review the material.
1. **Finish up with a positive attitude!**

DISABILITY

Students with ADA-Documented physical, sensory, emotional or medical impairments may be eligible for reasonable accommodations. Veterans may also be eligible for services. All accommodations are coordinated through the Disability Resource Center (DRC) in Room 101 of the University Inn. (435)797-2444 voice, (435)797-0740 TTY, (435)797-2444 VP, or toll free at 1-800-259-2966. Please contact the DRC as early in the semester as possible. Alternate format materials (Braille, large print or digital) are available with advance notice.

HONOR CODE

The honor code will be strictly enforced in this course. Any suspected violations of the honor code will be promptly reported to the honor system. For more information please visit:
<http://www.usu.edu/policies/PDF/Acad-Integrity.pdf>

POSSIBLE ERRORS

The instructor reserves the right to correct any possible errors to this syllabus.