

Relationship to Campus-wide objectives:

Green River Community College has identified several educational objectives for all courses and all students on the campus. The objectives of this course include many of these campus-wide objectives which will be directly and indirectly monitored and assessed. These overlapping objectives include enhancement of proficiency in the following areas:

1. **Critical thinking and problem solving skills:** If there were only one objective to this course it would not be the retention of any fact that is associated with the subject matter called physics. It would be the development of skills needed to analyze any problem carefully, logically, analytically and creatively, with a hopeful eye toward the creation of a viable problem solving strategy.

Critical thinking and problem solving skills will be assessed using graded homework assignments, essays, quizzes, exams, laboratory exercises, and ungraded assessment tests.

2. **Mathematical and quantitative reasoning:** Successful completion of this course requires the mathematical modeling of many complicated situations, often using models which are not intuitively obvious. Students often comment that physics courses stretch their ability to translate from the real world to mathematical abstractions and back again more than any other.

Mathematical and quantitative reasoning skills will be assessed using graded homework assignments, quizzes, exams, laboratory exercises, and ungraded assessment tests.

3. **Clarity of communication and written expression:** Verbal exposition is often put to its most stringent test when technical material must be accurately and yet readably described. This course requires written discussion of highly technical subjects and precisely defined concepts, often blending the English language with the language of mathematics.

Communication and written expression skills will be assessed using graded homework assignments, essays, essay questions on exams, and presentations and written reports on laboratory exercises.

4. **Responsibility:** All students will be responsible for doing their own work *and seriously thinking about what they are doing!* Although it is tempting, especially in laboratory situations, to allow others to do our work for us, the successful students will be those who actively participate in all activities. Previous students have found it very difficult to make up for lost time in this class, so it is important for all students to work at least at the same pace as the rest of the class.

Students often believe that brain power alone determines performance in physics class. This is not the case! Before an anonymous in-class test, students were asked to estimate the fraction of the work that they had personally completed. Students who completed less than 80% of the course work averaged only 35% on the exam. Those who completed all of the course work averaged 80%.

5. **Aesthetic appreciation:** The teacher of this class freely pursued the study of physics when a career in engineering or any number of other fields would have been much more lucrative and required less formal education. The reason for this was simply a deep and abiding love for the astounding beauty of the subject matter. Your teacher sincerely hopes that some appreciation of this beauty will rub off on each and all of his students, although aesthetic appreciation will not be directly assessed.

Aesthetic appreciation of physics will be assessed in part through the work done in preparing and presenting an in-class project of the students choice and design.

Prerequisites:

Do you need Physics 222 or the equivalent? Absolutely. The concepts of momentum, energy, and force will appear repeatedly throughout this course.

Do you need Calculus, or concurrent enrollment in Math 152? Definitely. Mathematics starts to fly fast and furious by the end of the quarter. Understanding of some material presented in this course requires familiarity with sequences and Taylor series. This course will also include basic elements of multivariate calculus, differential equations, and linear algebra, but completion of those courses is not necessary for success in this class.

Textbooks:

1. ***Smart Physics: Mechanics*, by Stelzer, Selen, and Gladding. REQUIRED!**
***Smart Physics: Electricity and Magnetism*, by Stelzer, Selen, and Gladding. REQUIRED!**

INTERNET ACCESS IS REQUIRED. You will need an access code to view prelectures, complete checkpoints, and do homework. Most students also want to pay for the paper versions of the books as well but this is not completely necessary. At last check computer access codes cost \$25 and the books cost an additional \$20 each. If you have already purchased access for each of these volumes in the past you should not have to purchase it again. Note: SmartPhysics is not the same as SmartPhysicsHelp.com.

Supplemental Reading Material:

Students often request alternative reading material to supplement their general texts. Several calculus level physics texts are available for check out from the Physics Store Room (SMT 230). These include textbooks by Halliday, Resnick, and Krane (2 volumes), Halliday, Resnick, and Walker, and Serway.

However: students should be aware that there is little evidence that time spent *reading* another book is going to substantially increase your understanding or your grades. It is much better to spend extra time *doing* more physics problems, *discussing* the things that you find confusing, and *asking yourself* the kind of critical thinking questions modeled in the books by McDermott or Sokoloff and Thornton!

There are very few *facts* that you need to learn for this class. It simply requires time and effort to really understand and use the facts that you will learn.

REQUIRED COURSEWORK:**Laboratory requirements:**

Introductory laboratory work will be based on the exercises in the *RealTime Physics* laboratory manual. These exercises are designed to illustrate and clarify the concepts of physics and not to test the laboratory skill of the students. Thus the laboratory grade will be based on participation and assessment of student understanding. Laboratory exercises will be collected periodically, and there will be at least one laboratory quiz.

Later in the term there will be many laboratory exercises that will *not* come from *RealTime Physics*. These will often require more thinking and writing on the part of the students and these labs will be impossible to make up late. These labs will be graded generously but they will be graded.

Attendance: Attendance is absolutely *required* for the laboratory component of this course. Students who miss a single lab may lose 10% of their lab grade. Students who must miss more than one lab may have difficulty passing the course!

Meeting times: There will be one laboratory period almost every week. Lab periods will occupy half of the class periods scheduled in room SMT 231. Students in these classes are often confused about which classes are classes and which are labs. **THIS IS A GOOD THING!** You will learn the most by doing and thinking, not by sitting and taking notes (although you need to do that, too!)

Grades: Most of the lab grade will come from successful attendance and participation in lab exercises. Some lab work will be collected and graded, and there may also be two labs designed by students.

Homework (problem sets):

There will be roughly 21 problem sets from SmartPhysics assigned throughout the course of the term. *You are not required to do the homework individually! In fact you are encouraged to work together!* All Smart Physics homework assignments will require the use of a computer either on this campus or at home. Your homework grade will be based on *completion* of assignments. Students will receive full credit for assignments completed on time. Students will receive 90% credit for assignments completed within 48 hours of the due time.

Quizzes:

There will be roughly eight quizzes given throughout the term. Each classroom quiz will contain one long or several short questions, intended to be easily finished in 45 minutes, however take-home quizzes may also be given and these will in general be longer and more involved. Quizzes may involve assigned seating (which would not be announced until the time of the quiz).

Exams:

There will be one midterm exam. It will take roughly 90 minutes. It will be scheduled roughly five weeks into the quarter. The exact date will be announced well in advance. Exams may involve assigned seating (which would not be announced until the time of the exam).

The final exam for this course will be held at the times printed in the quarterly course schedule.

Physics 223 KCA (afternoon):	Thursday, June 13th , 2:20 PM 'til Whenever
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Attendance and tardiness:

Ten percent of the class grade will come from participation points. This class will not be graded on attendance, but students should be aware that due to the “hands-on” nature of what is done during class, it is very difficult to pass the class if attendance is lacking. Students who miss a class often ask, “What did we do yesterday?” as if a fiftenn second answer can replace class attendance. Experience has shown that it cannot. *Students who disrupt class through conversation or other behavior may lose points at the discretion of the instructor.* In such cases the decision of the instructor is final.

Grades:

Grades for this class will be computed numerically based on the fraction of a total of 100 possible points. Grades will be awarded for the following six components, with the indicated points for each:

Course component:	Fraction of grade:
Homework	10 points
Participation	10 points
Quizzes	20 points
Midterms	20 points
Laboratory exercises	20 points
Final Exam	20 points

Note that these point totals are subject to change if the instructor believes it would be to the benefit of the class (and the grades of the class) as a whole.

So how many points do I need to get an A? To pass?

Numerical grades will be computed based on the following mathematical formula:

Take your total number of points. Subtract 56 points. Divide by ten.

For quick reference, you may also look up grades in the following table:

Percent of Total Points	Numerical Grade		Percent of Total Points	Numerical Grade		Percent of Total Points	Numerical Grade
97-100	4.0		86	3.0		75	1.9
96	4.0		85	2.9		74	1.8
95	3.9		84	2.8		73	1.7
94	3.8		83	2.7		72	1.6
93	3.7		82	2.6		71	1.5
92	3.6		81	2.5		70	1.4
91	3.5		80	2.4		69	1.3
90	3.4		79	2.3		68	1.2
89	3.3		78	2.2		67	1.1
88	3.2		77	2.1		67	1.1
87	3.1		76	2.0		66	1.0
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Students are strongly encouraged to keep track of their own progress in this class. At any point in the course, students may compute their *average percentage* on completed material and use this table to estimate a grade. Students should note, however, that it is ultimately your instructor who makes the decision as to how many points each student actually has! Grading is a subjective exercise and the grade you receive may not be *exactly* the one that you calculate for your self.

Every attempt will be made to let you know what was and was not an acceptable score on the material that is handed back to you. Students should be forewarned that grades below 50% are not uncommon on individual quizzes and taken by themselves are not disastrous (providing there are other grades to lift the overall average). An *estimate* of your current grade will be distributed after the midterm is returned. Please remember that this is only an *estimate*.

A grade of "I" will only be given in emergency situations and only if at least 75% of the work is completed satisfactorily. *Note that a grade of "I" cannot be given simply to save a grade point average! There must be a REASON for requesting an incomplete.*

A grade of "P" or "NC" can only be given if requested in writing at the registrar's office before the deadline printed in the quarterly schedule. Students should know that completion of a course with a grade of "P" is usually *not* considered completion of a prerequisite for another class.

Students are NOT obligated to tell their instructors when a course is being taken for a P or NC grade!

Late homework, exams, etc.:

Exams and quizzes cannot be made up except in extraordinary circumstances. If a student knows that a forthcoming exam will compete with an urgent scheduling conflict, the student must notify the instructor *in advance!* In some cases it will be possible to make special arrangements for that student.

Homework will be accepted two days after it is due, but full credit will not be given.

Due to the nature of laboratory work, it will often be impossible to make up a late laboratory. Again, students who know of their inability to attend a specific lab should tell the instructor in advance.

Material Covered:

The schedule for material covered in this course will be roughly the following:

Time (approx.):	Subject:	SmartPhysics Units
WEEK 1:	Capacitors in circuits	Units 1 & 2
WEEK 2:	Oscillations	Units 3 & 4
WEEK 3:	Waves	Units 5 & 6
WEEK 4:	Magnetic forces and fields	Units 7 & 8
WEEK 5:	Sources of Magnetism	Units 9 & 10
MIDTERM EXAM		
WEEK 6:	Faraday's Law	Units 11 & 12
WEEK 7:	Inductance	Units 13 & 14
WEEK 8:	AC Circuits	Units 15 & 16
WEEK 9:	Electromagnetic waves	Units 17 & 18
WEEK 10:	Light and Optics	Units 19 & 20
WEEK 11:	Other extremely cool stuff	Units 21

Material may be added or removed from the schedule as time and interest allow.

“Guests” in the classroom:

Students seeking to visit the class must obtain instructor permission. Due to GRCC policy, any one who is not registered for the GRCC class or an employee of GRCC may be prohibited from attending the class during lecture or laboratory periods. This includes children, friends, visiting students, and prospective students. Exceptions will be made in the cases of students who require the assistance of others for the completion of essential classroom tasks or for students who are registered for another section of Physics but have made arrangements with their teachers to attend at a special time.

Outside help:

Physics students are encouraged to make use of tutoring services should they find the need for outside help. GRCC employs physics tutors in the Tutoring and Help Center. Physics help may be found in the tutoring center on the second floor of the Holman Library. Students who have trouble with the mathematics associated with their physics work may find additional help in the Math Learning Center.

Again, you are strongly encouraged to use your classmates as sources of outside help. *There is ample evidence that talking to your classmates is the best source of clarification and understanding because it will force YOU to think through your own difficulties, often removing confusion and solving problems at the same time! When all else fails, remain calm, sit back, and THINK!*

Class breaks and interruptions:

Official class breaks are required for all class periods of length two hours or longer. For class meetings that are between one and two hours long, class breaks are optional, *and official class breaks will usually not be scheduled!*

However, if you need to leave the classroom, stretch, take a break, please do so. This is much better than falling asleep during class and disturbing your neighbors with an annoying “thud” when your head hits the table. Try to take your breaks in a manner that disturbs your colleagues as little as possible.

You should know that GRCC policy officially prohibits the answering of pagers and cellular phones during class periods. Although your instructor understands that emergencies may occasionally arise when sick family members or other crises are concerned, a repeated pattern of classroom interruption by electronic gadgets will be considered grounds for discipline.

Discipline:

If anything happens in class that you feel might require disciplinary action, **please talk about it!** Talk to each other. Talk to your teacher. We will all be better off if we can settle differences without official disciplinary procedures. This section of the syllabus is about what happens if that fails.

Standard Procedure: You should be aware that the standard course of discipline at GRCC begins with a student's expulsion from the classroom for **three class periods**. If those class periods include exams, quizzes, or other assignments then the student will **receive a score of zero** on those assignments.

The law: You should also know that due to changes in the law, students may be *legally liable in a court of law* for words or actions that might create an atmosphere viewed as hostile by other students.

Disruptions: In accordance with GRCC policy, students who disrupt the academic atmosphere of the class will be asked to leave and will be referred to an academic dean for further action. Disruptions of academic atmosphere include any behavior that interferes with the ability of faculty or other students to perform the work necessary for this class.

Inappropriate discussion: Discussions in the classroom should concern matters relevant to the class or topics of general interest that are not demeaning or insulting. Courts have ruled that explicitly sexual discussions lead to an academically hostile atmosphere (see paragraph beginning with "The law", above). *Comments, discussions, or actions of a racist, sexist, or otherwise degrading nature will absolutely not be tolerated. Be careful about your use of words such as gay, black, white, etc.* Again, if you feel there are inappropriate discussions in our out of class, **please talk to each other**.

Cell phones: GRCC policy is that all cell phones must be turned off during class. Your teacher recognizes that emergencies do happen. If you feel you need to answer your cell phone during class, please leave the room quietly and take the call outside. You do not need to ask permission, just try not to disturb your fellow students.

Computers: The computers in the classroom are to be used only for academic purposes. Students may use them to check schedules or register for classes *only during class breaks*. While class is in session they should be used only for physics (absolutely no games!). Violation of this policy will result in expulsion from the class for three days.

Cheating: Cheating (such as collaborating on quizzes or exams) can cause a wide range of disciplinary actions. ***Students caught cheating on a quiz or exam will fail the course.*** Further discipline can range from loss of points for one section of the class to failure of the class and probation or expulsion from GRCC. Many of students cheat and most of them do not get caught. However, those that do are in universal agreement: cheating is not worth the risk.

Please keep in mind that you are in college to learn, and if you are cheating you ultimately only cheat yourself out of learning and skills that you would otherwise get from this class. You don't need to cheat to pass the class. Don't do it.

Every year, students flunk Physics 221, 222, and/or 223 because they were caught cheating. As a consequence they are not allowed to advance to the next course (for which they have usually already registered). To complete their majors they must repeat the course that they just flunked and by the time they realize this it is likely that all sections are full. **Cheating can add as much as a year to your college studies! IT IS NOT WORTH IT!**

Special needs:

Any student who needs special accommodations because of a disability, needs emergency medical information kept on hand, or requires any other special accommodations to be shared with me in the event of a building evacuation, please contact me at extension 4248. If you need an alternative medium for communicating, or are particularly dependent on any one specific medium, please let me know before class so that appropriate accommodations can be made.

If you believe you qualify for course adaptations or special accommodations under the Americans With Disabilities Act, it is your responsibility to contact the Disabled Students Services Coordinator in the LSC and provide the appropriate documentation. If you have already documented a disability or other condition which would qualify you for special accommodations, or if you have emergency medical information or special needs I should know about, please notify me during the first week of class. You can reach me by phone at 833-9111, extension 4248. Or, you can schedule an office appointment to meet me in the Marv Nelson SC Building, office number 221 during my posted office hours or at another mutually determined time. If this location is not convenient for you, we will schedule an alternative place for the meeting. If you use an alternative medium for communicating, let me know well in advance of the meeting (at least one week) so that appropriate accommodations can be arranged.

Syllabus Quiz:

On the following page there is a syllabus quiz. If you do not turn it in on time you will be turned into a newt (someday when you least expect it).

SYLLABUS QUIZ (Due Thursday)

NAME: _____ (please print)

PHYSICS 223 Section: _____ (Hint: when you are in class, what city are you in?)

Instructions: Read the syllabus, answer the questions below, and sign the form at the bottom indicating that you have read the syllabus. Return this to the teacher.

When are the meeting times for your section of Physics 223?

When are Keith Clay's office hours and where are his darn offices anyway?

The first day of class will be the 395th birthday of the guy who first made accurate measurements of the diffraction of light. Okay, the calendar was different then, but what was his name?

The final exam will be on the 240th birthday of the guy who first made accurate measurements of the interference of light and thus demonstrated that light is a wave. What was his name?

What will happen to a student who does not turn in this syllabus quiz?

When is the deadline for applying for a Pass/Fail grade? (*check the quarterly schedule*)

I have read the syllabus for Physics 223.

Signed,

(signature of student)

(date)

(favorite color)
