

# COURSE SYLABUS: Physics 101 B Concepts of the Physical World

COURSE WEB PAGE: <http://www.instruction.greenriver.edu/physics/keith/101>

**Instructor: Keith Clay**

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Office hours:	Tuesday & Thursday	10:00 -10:30 AM
	Tuesday & Thursday	Noon – 1:00 PM
	Tuesday & Thursday	5:30 PM – 6:30 PM

## **Class Meetings:**

SC 117	MTThF	10:30 AM - 11:50 AM
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**Course Objectives:** Despite the classification in the catalog, this is more of a course about *the process of science* than a course about *the body of information* called physics. Course work will include investigations of physical phenomena, not memorization of scientific “facts” from books. Successful students will develop skills in the following areas:

1. **Critical Thinking:** The most important tasks involved with understanding a physical problem are the analysis of the situation, construction of a mental model, and identification of relevant details. It is necessary to consider both *what you think you know* and *how you think you know it*. This is what is meant by critical thinking.
2. **Problem Solving:** To pass this course, it is not sufficient to merely learn *about* science. It is also necessary to learn *to do* science. The questions presented in this course will require refinement of problem solving techniques you may already have as well as the development of investigation methods which will most likely be new to you.
3. **Written Expression:** Technical achievement is of little use if it cannot be communicated. The clear and accurate written expression of ideas, using simple but precise language is an essential part of this course. Clear and accurate writing is central to the course, and there will be specific writing assignments as well as investigation notebooks.
4. **Experimental Investigation:** The main tools required for this course are your senses and a questioning mind. Most of the learning that takes place is to come from application of those tools to the world around us. (*Reminder:* This course is only an introduction to the ideas of laboratory science and does *not* satisfy the laboratory requirement for the AA degree.)
5. **Team work:** Almost all work will be completed by teams working together. It will be the responsibility of each member of the team to see that all members work together, participate, and understand all of the work done. Students will be required to change the members of their teams many times during the term.

**Relationship to Campus-wide objectives:**

GRCC 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 for students to develop skills needed to use and trust their own observations, to think through a problem carefully and logically, and to rely on what they know, not what they are told.

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

2. **Clarity of communication and written expression:** The clearest test of our understanding of an idea is often our ability to express and explain the idea to others. Students in this class will need to write clear explanations not only of what they believe to be true, but why they believe it.

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

3. **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 experimental 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.

This course is taught through interactive exercises, most of which must be performed during class. This is an excellent class for hard working students who are eager to learn but have little or no background in math and science. ***This is a terrible class for students who have trouble attending class or completing assigned work on time!***

*Student responsibility will be assessed by giving students freedom and responsibility for classroom work, by taking attendance, and by enforcing due dates on assigned work.*

4. **Aesthetic appreciation:** The teacher of this class freely chose the study of physics when a career in engineering or any number of other fields would have paid much more money and required less 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:**

**None.** This course requires students to pay attention to material studied in *this* class.

**Textbook:**

There is no real “book” to buy for this class. The required learning materials that we will use are the sets of worksheets and study guides entitled:

***Electricity Visualized: the CASTLE project***, by Steinberg, Nelson et al.

This is available in the physics section of the bookstore for a cost of about ten dollars. These materials are *required*. In case you are wondering, the GRCC staff do *not* profit from the sale of this material.

**Required supplies:**

**Notebooks:** The class “notes” for this class will be the same as the class “textbook” (the materials described above. Classroom exercises and homework will be primarily composed of completed exercises from these materials. In the case of our study of electricity (the CASTLE notes) these exercises will be filled out on the same pages as the materials themselves. In the case of our study of optics (the OPTICS notes) notes on separate sheets (notebook paper or graph paper) will be required.

**Students are REQUIRED to have a loose-leaf notebook in which to actually keep the class notes.** On a daily basis, students will be completing their exercises and storing them in this notebook. **PUT YOUR NAME ON THE OUTSIDE FRONT OF YOUR NOTEBOOK!**

Students will also be REQUIRED to keep a small flat binder or folder (something similar to a “pee-chee”) capable of storing a few pages of notes. This will be used for the submission and grading of homework. Students will be instructed when to place certain pages of their work in this binder which will then be reviewed by the instructor. **PUT YOUR NAME ON THE OUTSIDE FRONT OF THIS ONE, TOO!** Make sure the name is obvious and readable.

**Pens, pencils, etc.:** Most work recorded in the investigation notebook must be *written in ink!* You will also find pencils useful, however, for sketching diagrams and marking exercise sheets. It will be useful to have pens or pencils of more than one color (red, orange, yellow, green, blue). Colored pencils will be provided for use during class when they are needed.

**STUDENTS WILL BE GRADED ON THE FOLLOWING:****1) Homework (problem sets):**

There will be nine problem sets assigned throughout the course of the term. Most of the problems will be taken from the reading material. *You are not required to do the homework individually! In fact you are encouraged to work together!*

Most homework assignments will be done directly in the notebooks. There will also be occasional assignments made from other sources which will be recorded separately.

Every attempt will be made to get the results of the graded homework back to you as quickly as possible, but there are no guarantees. To facilitate rapid return of the homework the instructor may select only a fraction of the assigned problems to grade and/or a student grader may be used. The instructor will always review and maintain responsibility for the grades assigned.

Homework will be accepted one day late will receive only 80% of the possible points. No homework will be accepted more than one day late. *Students facing emergencies that require them to miss class or delay assignments should contact the instructor (253-833-9222 ext 4248) before the class that is to be missed!* Although there will usually be no accommodations made, in rare cases special accommodations can be made. No such accommodations will be made if the instructor is notified *after* the missed class period.

**2) Quizzes:**

There will be eight quizzes given throughout the term. Each quiz will contain one long or several short questions, intended to be easily finished in 30 minutes. *Some quizzes may not be announced beforehand!* (That is, there *may be* “pop” quizzes.) *Quizzes may begin at the beginning or at the end of the class period!* It should not go without notice that this requires prompt attendance at the start of each class since missing a quiz *may* influence a grade.

*Quizzes may not be taken late!* However, since your instructor understands that disasters may strike at any time, *one* quiz score (the lowest score) will be dropped from your final grade. If a student misses one quiz, that quiz will be given a score of zero and will become the quiz that is dropped (so missing a single quiz will not count against you). Even so, try not to miss quizzes.

**3) Projects:**

There will be two projects assigned during the term. Students will have roughly a week to complete each one. The purpose of the projects will be to allow students more time to apply what they have learned on a deeper level. The projects will involve material similar to what has been investigated in class, with possible applications to some real world problems.

The subjects of the two projects will be:

1. Description of the electric circuits behind some simple household gadgets.
2. Study of issues related to energy production and consumption.

**Computer work:** Some computer work is required in Physics 101. Don't worry if you aren't very comfortable working with computers. You will learn along with everybody else. This work is required and will be graded as part of the project grade. This work will be graded primarily based on completion and participation, but it will account for one third of the project points.

**5) Attendance:**

Attendance and class participation are absolutely essential parts of this class. Much of the learning in this course is to be collaborative, and your classmates cannot collaborate with you if you are not here. Attendance and participation will be measured *daily* by taking roll as well as by more active means, and student participation will have an impact on final grades.

*There will be 20 attendance points awarded toward final grades.* There will be no excused absences or un-excused absences. All absences will be counted the same way. *Students who miss four or fewer classes will receive full attendance credit for the course.* (A 91% attendance record will be counted the same as 100%).

***After the fourth absence, each absence will result in the loss of four attendance points.*** Nine absences will result in an attendance score of **zero** (since all twenty attendance points will have been lost).

*Students who miss more than nine classes will not be allowed to pass the class! (They will receive a final grade of 0.0.)* Students should note that this requires them to attend at least 80% of the scheduled classes.

***Roll may be taken at the beginning and end of each class period!*** Students who attend late may be counted as absent. Students who wish to contest a counted absence are encouraged to do so *during office hours or after class but never during class.*

**6) Exams:**

There will be one midterm exam and one final exam. The midterm will cover concepts of electric circuits and the final will emphasize energy along with review of electric circuits. The exams will be similar in content to the subjects of quizzes and class work. The final exam will be **Wednesday, December 12<sup>th</sup>, at 10:00 AM.** ***Notice: the final begins before class time!***

**GRADES WILL BE CALCULATED BASED ON THE FOLLOWING:****Points awarded:**

Grades for this class will be computed from the following six components which will be awarded points as follows:

<b>Course component:</b>	<b>points:</b>
Homework	10 points
Classwork (notebook)	10 points
Quizzes	20 points
Two projects	10 points
Attendance/Participation	10 points
Midterm	20 points
Final Exam	20 points

**Conversion from points to grades:**

Numerical grades will be computed according to the following formula:

***Take your total points in the class, subtract 55 points, and divide by ten.***

For example, a student who finishes the class with 88 points will get a grade of roughly:

$$(88 \text{ points} - 55 \text{ points})/10 = 3.3$$

A student who finishes the class with 96 points should get a 4.0, while a student who finishes with a total of 66 points will get a 1.1. You can look up your approximate grade in the following table:

Percent of Total Points	Numerical Grade	Percent of Total Points	Numerical Grade	Percent of Total Points	Numerical Grade
95-100	4.0	85	3.0	75	2.0
94	3.9	84	2.9	74	1.9
93	3.8	83	2.8	73	1.8
92	3.7	82	2.7	72	1.7
91	3.6	81	2.6	71	1.6
90	3.5	80	2.5	70	1.5
89	3.4	79	2.4	69	1.4
88	3.3	78	2.3	68	1.3
87	3.2	77	2.2	67	1.2
86	3.1	76	2.1	66	1.1
		0 - 65	0.0		

Every attempt will be made to let students know what was and was not an acceptable score on the material that is handed back to you. An *estimate* of your current grade will be calculated during the quarter, so you will receive a report of your *current* grade during the term. Please remember that these are only *estimates*, and that your final grade will not be determined until after the final exam.

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.* Due to the nature of this course, students who receive a grade of “I” will be required to meet with a Physics 101 class during a subsequent school term and finish the required material with that class.

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. 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!*

**Extra credit:** There is no extra credit in this class. Don’t ask. This grading policy does NOT contain any magic secret to getting a grade of 4.0 out of this class! Students who average better than 95% on all assignments will get a 4.0. The way to do well in this course is to do every assignment, pay attention during class, and study what you have learned at home.

**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. (Remember, one quiz score will be dropped.)

Homework will be accepted for one class day after it is due. Roughly 20% of the possible points will be deducted from homework turned in on the class day after it is due **IF THE SOLUTIONS HAVE NOT YET BEEN DISTRIBUTED.** *It is not a good idea to get into the habit of turning homework in late!*

Due to the nature of class work, it will often be impossible to make up a late exercise. Again, students who know of their inability to attend a specific lab should tell the instructor in advance. **No late work will be accepted during the last two weeks of the school term.**

**NOTICE:** Much of the material for this class is difficult to learn without your “hands on” the appropriate equipment! All of the learning that takes place is intended to be through active investigation using materials available at GRCC. There may be *some* opportunities to make up missed days of investigations, but these will be very limited. In general, students should regard a day of absence as equivalent to an assignment that did not get done and will not be accepted!

**ALSO NOTICE:** There will be a very limited opportunity to borrow class materials (circuit boxes, mirrors, etc.) for use outside of class. The demand for this equipment is very high and so it will only be checked out to students on a very limited basis.

**Material Covered:**

The material covered for this course will include the first seven sections of *ELECRICITY VISUALIZED* (also known as “*the CASTLE project*”). More material will be covered if time allows, but students should be prepared to cover roughly one section per week. *Since much of the material can ONLY BE COVERED IN THE CLASSROOM, students should not miss classes unnecessarily.* Material may be added or removed from the schedule as time and interest allow.

**“Guests” in the classroom:**

Due to GRCC policy, no one who is not either registered for the class or an employee of GRCC will be allowed in the classroom during lecture or laboratory periods. This includes children, friends, visiting students, and prospective students. The only exceptions that will be made will be 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 101 but have made arrangements with their teachers to attend at a special time.

**YOUR HUMBLE INSTRUCTOR HAS BEEN IN TROUBLE FOR VIOLATING THIS POLICY IN THE PAST, AND SO NO EXCEPTIONS WILL BE MADE THIS QUARTER!**

**Outside help:**

Physics students are encouraged to make use of tutoring services should they find the need for outside help. As of this writing, GRCC has not chosen an official physics tutor qualified to

help with the 101 class, but there are many talented students available. Physics help may be found in the tutoring center on the second floor of the Holman Library.

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. Since our class meetings 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:**

**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. *Comments, discussions, or actions of a racist, sexist, or otherwise degrading nature will absolutely not be tolerated.*

**Cheating:** Students who have been caught cheating should expect to fail the assignment in question at the very least and possibly fail the entire course. Students who are caught cheating will also be referred to an academic dean for further discipline. The results of academic discipline can range from failing the assignment in question to failure of the class and probation or expulsion from GRCC. Lots 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 are ultimately only cheating yourself out of learning and skills that you would otherwise take from this class. You don't need to cheat to pass the class. Don't do 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 SMT Office Building, office number 333 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.

(This page is intentionally left blank for the purposes of student notes.)

## SYLLABUS QUIZ (Due Thursday)

NAME: \_\_\_\_\_ (please print)

PHYSICS 101 Section: \_\_\_\_\_

**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 your instructor.

When are Keith Clay's office hours, and where is his office anyway? Name one thing that he has a picture of on his door.

A student who averages 83% on Physics 101 assignments will get what grade for the class?

What happens if a student cannot attend class on the day of a quiz? What score should the student expect to get on that quiz?

If a student misses one (and only one) quiz during the term, what happens to that quiz score?

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

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I have read the syllabus for Physics 101.

Signed,

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(signature of student)

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(date)

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