

**Instructor:**

Dr. Howard L. Richards  
 Office: Science 105

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Instructor's Schedule (including office hours\*):

	Monday	Tuesday	Wednesday	Thursday	Friday
12	PS 109		PS 109		PS 109
1					
2	Office Hours		Office Hours		Office Hours
3		Office Hours		Office Hours	
4		PHY 202		PHY 202	
5					PHY 204
6		PHY 201		PHY 201	

**Textbook:**

*Conceptual Physical Science 5th edition*, by Paul G. Hewitt, John A. Suchocki, and Leslie A. Hewitt (Pearson 2012, ISBN: 978-0321753342)

**Catalog Description:**

**109 General Physical Science. 3 hrs. I, S.**

The course covers the basic principles and concepts of the universe including energy, and its various forms. Force, motion, electricity, magnetism, the wave theory of light and sound and astronomy are also studied. (PR: MTH 121, or MTH 123, or MTH 127, or MTH 130, or MTH 130E, or MTH 229, or MTH 203, or MTH 121B, or MTH 130H; CR: PS 109L lab) 3 lec.

**General Description:**

PS 109 is half of a 2-semester survey of Physical Science, satisfying Core II Natural Science; it forms 1/3 of science content for K-6 Education majors. We'll describe objects' appearances (such as the Sun-Earth-Moon system) using diagrams and models, and will explain their behavior with physically important quantities (momentum & force and energy & action). We will incorporate these quantities in molecular theory to explain material properties, and processes in matter (such as liquid vs gas, and electricity, stars, light). Physical models will illustrate Arithmetic concepts; especially addition, multiplication, division, factoring. Quantity names will be abbreviated so that key statements about them can be written in concise unambiguous forms, to be manipulated via algebra, and drawn on graphs.

**Grades:**

**A ≥ 90 > B ≥ 75 > C ≥ 65 > D ≥ 55 > F**

**Unit 1 Exam = 15%**

**Unit 2 Exam = 15%**

**Final Exam (mostly Unit 3) = 25%**

**Quizzes = 20%**

**Best Exam Score = additional 10%**

**Online Homework = 10%**

**Presentation = 5%**

\* Office hours are subject to change, with notice given in class and on the web page. The instructor will make a serious effort to be in his office during office hours, but circumstances will sometimes require him to be elsewhere. Students are strongly urged to make appointments in advance when possible.

### Course Learning Objectives:

Students will ...	Practiced by ...	Assessed through ...
Apply the principles of physical science to choose the correct description or outcome of physical situations.	Quizzes, Homework	Exams
Solve physical science problems through a sequence of reasonable steps.	Homework, Presentations	
Correctly define technical terms used in physical science.	Quizzes	

### Exams:

The course divides into 3 large Units.

- **Unit 1:** Ch.1 – 4, (26) = Motion, Force and changing motion, Momentum, Energy, Orbits.
- **Unit 2:** Ch.5 – 9, (26)= Fluids, Heat & Matter, Engines, Electricity & Magnetism, Planets
- **Unit 3:** Ch.10 – 12, (13), 27 = Oscillations & Waves, Atoms & Light, Sun & Stars, Galaxies.

Exam 1 will cover Unit 1 and Exam 2 will cover Unit 2. The Final Exam will concentrate on material from Unit 3, but it will also include some material from Units 1 and 2. Please understand also that these materials are somewhat cumulative: for example, you will be introduced to the concepts of force, momentum, and energy in Unit 1, but those concepts will be applied to understand the new concepts in Units 2 and 3.

### Final Exam is Required:

**From the Undergraduate Catalog:** “Students are required to take all regular examinations. If a student attends a course throughout the semester and is absent from the final examination without permission, the instructor counts the examination as zero and reports the final grade of *F*. If the absence is the result of illness or some other valid reason beyond a student's control, the instructor reports a grade of *I*. In all cases, the student must verify the reason for the absence.”

### Quizzes:

Quizzes will be given approximately once per week. The quizzes may involve multiple choice questions, matching, fill in the blank, or the complete solution of a numerical problem using the problem-solving sheet (about which more will be said later). These may be seen as practice for the exams.

Quizzes are meant to be relatively low-risk assessments, so only the top 10 of the roughly 15 quizzes will count towards your grade. However, each of those counts as 2% of your grade, so (a) make sure you attend class regularly and (b) be prepared for a quiz on the material we have covered.

### **Homework:**

To access the online homework, go to [www.masteringphysics.com](http://www.masteringphysics.com) and use the access key that came with your textbook. If you have a used book or ordered the book online, you can buy an access key directly from the Mastering Physics website. The code for this course is PS109102FALL2014RICHARDS.

### **Presentations:**

You know how a sentence is supposed to convey a complete thought? Well, an answer in science is never really just a number, it is always at least a complete thought. In most cases, it is a whole series of thoughts, starting from well-established premises and leading to a conclusion. Although this process is almost never as rigorous as a mathematical proof (because the premises are not that certain), it still needs to be logical and convincing. It needs to make sure there are no ambiguities in how quantities are defined, and a sketch helps to avoid confusion both in the person hearing (or reading) the answer and in the person attempting the answer. These are very basic aspects of science, and any scientist will automatically use them (perhaps somewhat informally – “back of the envelope” and “back of the napkin” solutions are not just an expression).

Based on these considerations and on George Polya's book *How To Solve It: A New Aspect of Mathematical Method*, I have put together a “problem-solving sheet” which can be found on the MUOnline page for this course. Each student will be assigned one problem (assignments will be given at the end of the first week) to solve. The solution must be worked on the problem-solving sheet (which will also be used for some test problems) and presented to the class. A serious attempt is expected so that we can discuss the correct way to solve problems and everyone will see what the instructor is looking for, but as long as this effort is given, this is a participation grade. If the effort is not satisfactory, the student will be given the chance to present a different problem.

### **Schedule:**

08/29/14	Last Day to Add Classes
09/01/14	Labor Day – University Closed
09/02/14	“W” Period Begins
Friday, September 26, 2014	<b>Exam 1 (subject to change)</b>
Friday, October 31, 2014	<b>Exam 2 (subject to change)</b>
	Last Day to Drop an Individual Course
11/24/14 – 11/29/14	<b>Thanksgiving Break</b>
12/1/14 – 12/6/14	Semana de Muertos
<b>Friday, December 12, 2014</b>	<b>FINAL EXAM (10:15-12:15)</b>

### **Academic Dishonesty:**

“Academic Dishonesty is something that will not be tolerated as these actions are fundamentally opposed to ‘assuring the integrity of the curriculum through the maintenance of rigorous standards and high expectations for student learning and performance’ as described in Marshall University’s Statement of Philosophy.” Cheating and other forms of academic dishonesty will bring serious sanctions, including possible expulsion, as described in the *Undergraduate Catalog*.

Cheating on an exam or quiz will result in being reported to the Dean of Students and, at minimum, either  
(a) having all suspect work marked wrong or  
(b) having the course grade reduced by one letter grade,  
whichever is the heavier penalty.

You may work together on homework, but do not just copy someone else’s answers. Not only is this dishonest, **it will make you more likely to do badly on the next test.**

### **Policy for Students with Disabilities:**

Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271, to provide documentation of their disabilities. Following this, the DSS Coordinator will send a letter to each of the student’s instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit [http://www.marshall.edu/disabled\\_or](http://www.marshall.edu/disabled_or) contact the Disabled Student Services Office.

### **Students with Medical Conditions:**

In addition to the above, students with medical conditions, temporary or permanent, that may require special attention (for example, epilepsy) or accommodation should inform the instructor as soon as possible.

Your privacy will be respected.

### **University Policies:**

By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to [http://www.marshall.edu/academic-affairs/?page\\_id=802](http://www.marshall.edu/academic-affairs/?page_id=802).

- Academic Dishonesty
- Excused Absence Policy for Undergraduates
- Computing Services Acceptable Use
- Inclement Weather
- Dead Week
- Students with Disabilities
- Academic Forgiveness
- Academic Probation and Suspension
- Academic Rights and Responsibilities of Students
- Affirmative Action
- Sexual Harassment

### **Classroom Behavior:**

Disorderly conduct that interferes with the normal classroom atmosphere will not be tolerated. The classroom instructor is the judge of such behavior and may instruct a disorderly student to leave the room with an unexcused absence. More serious misconduct may result in a complaint to the Office of Judicial Affairs. "Official University action will be taken when a student's or student group's behavior violates community standards, interferes either with the University's educational purpose, or with its duty to protect and preserve individual health, welfare, and property. When the behavior is aggravated or presents a continuing danger to the University community, accused students are subject to separation from the institution."

As a rule, **no food or drink** is allowed in the classroom. This is not always rigorously enforced, but certainly **it is never permissible to leave a mess**, whether crumbs or empty bottles, nor to distract the students around you. You are a grown-up, so act like one and be considerate.

Along the same lines, **all cell phones must be turned off or set to vibrate only** before the beginning of class. Any student who takes a call must leave the classroom to do so. Phone calls may not be placed or received during quizzes or tests. No devices may be used to play games or watch videos unrelated to classroom discussions.

**You may not use your phone as a calculator during tests, nor any other tablet or device capable of sending or receiving text, emails, video, or phone messages. You can get a very good scientific calculator (e.g., Casio *fx-300ES PLUS*) for less than \$20; I recommend choosing one with two-line display (so you can check for typos in your input) and at least 3 memory locations (usually named A, B, C, ...) in which you can store intermediate results to avoid rounding error. Of course, if some other department required you to buy an unnecessarily expensive graphing calculator, you can use that, too.**

Please **do ask questions** if you do not understand a concept, derivation, or calculation. Do not be embarrassed to ask; if you have a question, others probably have the same question! Let me know if I am going too fast or too slow. Private chats with other students, on the other hand, must be kept to an absolute minimum during class time; they are very distracting.