

**SHEPHERD UNIVERSITY**  
**GSCI 103 General Physical Science**  
**Spring 2009**

**Instructor:** Dr. D. L. Henry  
Office: Byrd Science Center 216  
Phone: Campus extension 5231  
Email: [dhenry@shepherd.edu](mailto:dhenry@shepherd.edu)  
Webpage: <http://webpages.shepherd.edu/DHENRY/>

From time to time, email messages may be sent to the entire class for special announcements, especially if there is any question about whether class will be held during times of bad weather. The email will be sent via the Shepherd University RAIL system, which uses the student's Shepherd University email address. If you wish, you can go to <http://mail.shepherd.edu/> to have the University server automatically forward your Shepherd email to your personal email address.

### Course Description

Catalog description: *A survey course designed to explore the major physical phenomena in the natural sciences, encompassing a study of motion, energy, electromagnetism, waves (light and sound), and atomic and nuclear physics. The course will meet in three one-hour lectures and one two-hour laboratory session. (Four credit hours)*

GSCI 103 Lab Section must be taken with the corresponding GSCI 103 Lecture Section. (This course together with GSCI 104 will satisfy the General Studies laboratory science requirement. The two courses may be taken in any order.)

**Texts:** *Conceptual Physics*, by Paul G. Hewitt, 9th edition (Addison Wesley, 2002) and *Practicing Physics*.

**Lab Manual:** The GSCI 103 lab manual required for Dr. Henry's GSCI 103 section is available in the Shepherd University Bookstore.

**Calculator:** A scientific calculator is required. Calculators such as a TI-30Xa, Casio FX-300MS Plus, Casio FX-115MS Plus, Casio FX-260 Solar Scientific, Casio FX-300W Scientific Calculator, HP 9s Scientific Calculator, or HP 30s scientific calculator are acceptable and available for about \$15 or less.

### Objectives

This is an exciting exploration of the basic principles of physics, which is the science that underlies all others. Along with the science, you will learn about some of the giants who developed the theories that explain our universe, from Aristotle to Hawking, and you will learn about the process of science. We will study forces, energy, gravity, planets, liquids, light, the atom, the the Big Bang, among other topics. We will learn that our intuition is sometimes right but many times wrong.

Physics is a mathematical science, and anyone who truly wants to understand physics must know mathematics. For this course it is assumed that you know high school algebra (through the second year) and some trigonometry. This math is necessary for learning how to solve problems in physics.

There are many techniques to help you understand physics. The text is the starting point, and we will use

the ancillary material *Practicing Physics* and the laboratory manual.

It is critical that you attend all classes and lab sessions and keep up in the class. If you miss a class, then you may have difficulty with all the material that follows. To help you keep up and learn, there will be weekly quizzes and five tests--plus a comprehensive final exam. Quizzes and tests give you the opportunity to communicate what you have learned. During class you are free and encouraged to ask questions at any time.

You will learn great things, and I hope we have fun along the way.

## **GOALS AND EXPECTED STUDENT OUTCOMES FOR SCIENCES**

### **Goal No. 2: Develop the capacity for critical thinking, reasoning, and analyzing**

It is necessary for students to learn to evaluate and analyze information, in all physical and social sciences, humanities, and professional endeavors in order to make intelligent use of that information. Students need to learn that there are numerous ways of discovering and processing information, and applying it to a given situation. The General Studies Program should equip students with the ability and desire to think critically and to reach well reasoned conclusions about specific issues. Only as students become skillful in evaluating and analyzing information will they be able to engage in the intellectual activities which require critical thinking.

*Intended Student Outcome:* Understand and utilize systematic problem solving techniques.

*Intended Student Outcome:* Analyze textual information.

*Intended Student Outcome:* Understand cause and effect relationships.

*Intended Student Outcome:* Understand basic scientific concepts and methods.

### **Goal No. 3: Develop oral, written, and mathematical skills**

The mastery of oral, written, and mathematical skills is an essential component of the General Studies Program. These skills are a fundamental requirement in any society which encourages and thrives upon the free interchange of ideas and information. In this context, mere functional literacy can never be an adequate goal; students should attain a level of proficiency in math and English which will enable them to become informed, effective citizens in their society and world.

*Intended Student Outcome:* Develop effective speaking skills.

*Intended Student Outcome:* Employ Standard Written English usage and mechanics.

*Intended Student Outcome:* Effectively develop and write reports and essays, employing thesis, textual support, and analysis.

*Intended Student Outcome:* Develop competent mathematical skills.

*Intended Student Outcome:* Utilize tools such as charts, graphs, and equations to represent functional relationships and explain their meaning.

*Intended Student Outcome:* Utilize computer technology in developing written and mathematical skills.

### **Grading**

Hours tests:	60 %	90-100 = A
Final exam:	15 %	80-90 = B
Homework & quizzes:	15 %	70-80 = C
Lab:	10 %	60-70 = D
		0-59 = F

## Course Policies

- **Attendance is required.** You can't learn the material if you are not there, and we will be doing a variety of activities during every class session.
- **Read the text!** The text is the primary source of information. Although class activities will follow the text closely, additional information and explanations will be given in class.
- A student who **misses a class** is nevertheless responsible for all material covered and all announcements (such as assignments and the date of the next test) made during that class.
- There will be five **tests**, plus the final exam, during the semester. **A make-up test will be given only if an excuse is deemed acceptable by the instructor.** Generally, an absence on the day of a test will be excused only if it was beyond the control of the student.
- Each **test** may consist of a combination of multiple choice, short essay question, short answer, and problems.
- **Dates of tests** will be announced in class; the schedule below is only approximate.
- There will be a weekly 15-minute **quiz**, and a quiz is usually an assigned exercise or problem. **There are no make-up quizzes!** A zero will be recorded for each missed quiz. Occasionally a homework assignment will be given in lieu of a quiz. The lowest two quiz grades will be dropped.
- **Exercises and problems** at the end of the chapters will be assigned for homework. Assignments will be made in class as the semester progresses. This homework will not be collected, but the assigned exercises and problems may show up in quizzes, tests, and the final exam. **So do them.**
- The final exam will be **comprehensive**.
- At my discretion, at the end of the semester—after the **final averages** have been calculated (with 2 quizzes dropped)—if the median average is less than 75, the same number of points will be added to each student's average to raise the class *median* to no more than 75.
- Labs and related exercises will be performed every week. **Attendance is required for all lab sessions.** A zero will be recorded for each missed lab. The lowest lab grade (except for those labs for which a formal report is required) will be dropped.
- **Cell phones** and the like must be turned off during all class sessions. If you are expecting an emergency call, you may request permission to leave your phone on.
- Please be **on time** to class and give full respect and consideration to myself and your classmates and do not hold conversations while I or another classmate is speaking. An atmosphere of mutual respect is expected in the classroom at all times.
- **Weather:** If the University is open, I will hold class. When in doubt, check my voice mail message at 876-5231 or my website at <http://webpages.shepherd.edu/dhenry/>.
- *"The principles of truth and honesty are recognized as fundamental to life at Shepherd. The University expects both faculty and students to honor these principles. This means all academic work will be done by the students to whom it is assigned, without unauthorized aid of any kind."*
- **Academic Integrity:** As stated in the College Catalog under Academic Dishonesty, **all forms of cheating will result in the grade of F for the course.** Academic dishonesty includes copying answers from another student, using unauthorized notes during an exam, plagiarism, stealing and distributing exams or their parts, or any action that appears to give a student an unjust advantage over other students when obtaining a grade for a course.

## Course Schedule

This schedule is subject to change as the semester progresses. Dates of tests will be announced in class.

DATES	CHAPTER	TOPICS
Jan 12-16	1 2	About Science Newton's First Law of Motion--Inertia
Jan 19	<i>no classes</i>	<i>M. L. King, Jr., Day (University closed)</i>
Jan 20-23	3	Linear Motion
Jan 26-30	4	<b>TEST: Chapters 1 - 3</b> Newton's Second Law of Motion
Feb 2-6	5	Newton's Third Law of Motion
Feb 9-13	7	<b>TEST: Chapters 4 - 6</b> Energy
Feb 16-20	9	Gravity
Feb 23-27	10	Projectile & Satellite Motion
Mar 2-6	13	<b>TEST: Chapters 7, 8, 10</b> Liquids
Mar 9		<i>Mid-term grades due</i>
Mar 9-13	19 20	Vibrations and Waves Sound
Mar 16-22	<i>no classes</i>	<i>Spring Recess</i>
Mar 23-27	22	<b>TEST: Chapters 13, 19, 20</b> Electrostatics
Mar 30-Apr 3	23	Electric Current
Apr 6-10	24	Magnetism
Apr 13-17		<b>TEST: Chapters 22, 23, 24</b>
Apr 23-24	<i>no classes</i>	Weekend break – IF no snow closings!
Apr 27-May 1	28	Reflection and Refraction
<b>Section 02: Mon May 4 12 -2</b> <b>Section 03: Fri May 8 9 - 11</b>		<b>FINAL EXAM – All chapters!</b>

## Assignments

Chapter	Exercises	Problems
1	2, 3	--
2	6, 7, 11, 12, 13, 16, 19, 20, 22, 23, 25, 29, 31, 33, 36, 39	--
3	1, 4, 8, 11, 14, 16, 27, 29, 35	1, 2, 3, 5, 8, 9
4	3, 4, 11, 15, 18, 19, 22, 25, 26, 28, 30, 33, 35, 39, 42, 48, 50	2, 5, 7
5	2, 3, 6, 9, 17, 18, 19, 20, 22, 25, 28, 35, 36, 40	2, 3
7	1, 4, 5, 7, 9, 10, 12, 15, 18, 21, 23, 28, 30, 35, 36, 39, 42, 46, 47	1, 2, 3, 8, 9
9	2, 3, 9, 10, 12, 14, 16, 17, 22, 25, 31, 33, 37, 41, 44, 45	1, 4, 7, 8
10	5, 6, 7, 10, 16, 18, 24, 25, 27, 33, 34, 35, 38, 47, 48, 49	1, 4, 8, 9, 10
13	1, 5, 6, 7, 9, 10, 11, 12, 14, 15, 19, 21, 26, 27, 28, 30, 34, 35, 36, 38, 39, 41, 44, 47	1, 2, 3, 4, 5, 9, 11
19	1, 2, 4, 10, 11, 12, 13, 14, 20, 21, 22, 23, 24, 26, 28, 30, 31	1, 2, 3, 4, 5, 7, 9
20	1, 2, 5, 7, 8, 11, 12, 16, 18, 20, 24, 25, 26, 28, 30, 39	1, 3, 4, 5, 10
22	2, 6, 7, 8, 10, 12, 15, 19, 22, 24, 25, 29, 33, 38, 39, 40	1, 3, 5, 6, 7, 9
23	2, 4, 5, 8, 14, 15, 16, 17, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 33, 35, 39, 40, 41, 42, 44, 45, 49, 50	1, 2, 4, 6, 7, 8
24	2, 4, 5, 7, 8, 13, 15, 17, 24, 25, 26, 28, 30, 34, 38, 40	--
27	1, 3, 6, 10, 12, 13, 15, 16, 25, 27, 28, 36, 37	--
28	2, 4, 6, 7, 9, 10, 11, 12, 13, 14, 18, 19, 23, 25, 29, 36, 39, 42, 47	1, 3, 4, 5, 7, 8