

PHS 110 – Fundamentals of Physical Science (16747)

Prerequisite: MAT 090/091/092/093 Developmental/Introductory Algebra (with a C or above) or satisfactory score on Math Placement exam

16747: TR 10:00 AM – 11:15 AM in PS 175 lecture

16748: R 11:30 AM – 2:00 PM in PS 169 laboratory

Instructor: Mrs. Mary Harris, PS 112

Last day for withdrawal without instructor's signature: Friday, March 2, 2012

Last day student initiated withdrawal accepted: Monday, April 23, 2012

Final Exam: Thursday, May 10, 2012 from 10 AM to 11:50 AM in PS 175

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Email: m.harris@gmail.maricopa.edu

Web Info: www.gc.maricopa.edu/appliedscience/mjahweb/mjahhome.html

Office Hours: M 11:00 AM – 12:00 PM

 T 12:00 PM – 1:00 PM

 W 11:00 AM – 1:00 PM

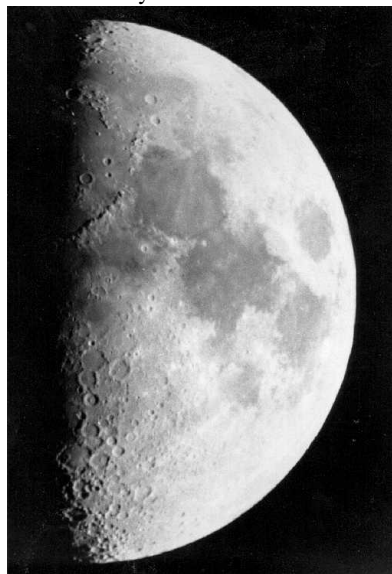
 F 11:00 AM – 12:00 PM

Text: Physical Science, 9th edition, Tillery ISBN: 9780073512211

Introduction to Physical Science Laboratory Exercises on Blackboard at

<https://ecourses.maricopa.edu/webapps/login/>

Photo courtesy VJK Harris



“Study is known to cause thinking, occasionally deep thinking. Typical side effects include mild temporary anxiety followed by profound long-term satisfaction.” Student Prospectus, University of Chicago

“Science is the attempt to make the chaotic diversity of our sense-experience correspond to a logically uniform system of thought.”
A. Einstein

“For most of human history we have searched for our place in the cosmos. Who are we? What are we? We find that we inhabit an insignificant planet of a hum-drum star lost in a galaxy tucked away in some forgotten corner of a universe in which there are far more galaxies than people. We make our world significant by the courage of our questions, and by the depth of our answers.” Carl Sagan

Course Outline

<u>Week</u>	<u>Lecture</u>	<u>Assigned Homework (9th Ed.)</u>	<u>Lab</u>
1 (1/17)	What is Science?	Ch 1 Questions: 5,7,9 Exercises: A 1,3,7,9; B 3,9	1. Scientific Notation and Metric Units – part 1
2 (1/24)	Motion I	Ch 2 Questions: 1,3 Exercises: A 2,8,13,15; B 2,8,15	1. Scientific Notation and Metric Units – part 2
3 (1/31)	Motion II	Ch 2 Questions: 5,7,8 Exercises: A 24,25,28; B 24,25,28	2. Acceleration FQ #1: WHAT IS SCIENCE
4 (2/7)	Motion III	Ch 2 Questions: 10,12 Exercises: A 20,22,23; B 20,22,23	3. Vector workshop FQ #2: MOTION
5 (2/14)	Energy	Ch 3 Questions: 2,11,12 Exercises: A 2,5,11,13; B 11,20	4. Momentum workshop FQ #3: ENERGY
6 (2/21)	Heat and Temperature	Ch 4 Questions: 1,2,8 Exercises: A 1,3,5; B 1,3,5	Test 1 (Ch 1 – 2)
7 (2/28)	Thermodynamics	Ch 4 Questions: 11 Exercises: A 7,10; B 6,7,10	6. Specific Heat and Center for Learning 1 FQ #4: HEAT + TEMP.
8 (3/6)	Basic Electricity	Ch 6 Questions: 1,2,3 Exercises: A 1,2; B 1,2	7. Coulomb's Law FQ #5: ELECTRICITY
3/12 – 3/18	SPRING BREAK		
9 (3/20)	Atoms and Periodic Properties	Ch 8 Questions: 3,4 Exercises: A 2,4,12,15; B 4,12,15	Test 2 (Ch 3 – 4, 6)
10 (3/27)	Chemical Bonds	Ch 9 Questions: 1,2,6,7 Exercises: A 1,4,7; B 1,4,7	8. Safety Video + Chemical and Physical Changes FQ #6: ATOMS
Test #3 consists of three 2-page papers on the physics of sports. They are due in class on Tuesday 3/27.			
11 (4/3)	Chemical Reactions I	Ch 10 No homework assigned	9. Molecular Models + Diameter of Molecule
12 (4/10)	Chemical Reactions II	Ch 10 Questions: 3,4,5 Exercises: A 3,4,5; B 3,4,5	10. Chemical Reactions + Oxidation/Reduction FQ #7: CHEM. REACTIONS
13 (4/17)	Nuclear Reactions I	Ch. 13 No homework assigned	Test 4 (Ch 8 - 10)
14 (4/24)	Nuclear Reactions II	Ch. 13 Questions: 1,5,8 Exercises: A 1,4,5,6; B 1,4,5,6	11. Radioactive Half-Life FQ #8: NUCLEAR REACTIONS
15 (5/1)	Semester Review		Final Exam preparation FQ #9: SUPERQUIZ

¹ www.gc.maricopa.edu/cfl/studyskills

Course Grading

4 Tests (10% each)	40%
Cumulative Final	20%
Homework	10%
Lecture Quizzes	10%
Laboratory	20%

- Lab Reports are 75% of Lab %
- Formula Quizzes are 25% of Lab %

Homework is assigned and graded as an aid for the student. It is intended to help the student gain clearer understandings of some of the concepts presented in the class and to become more proficient at problem solving in physical science.

- Homework is due at the beginning of Tuesday's class, **the week after it is assigned**. Based on any needs for schedule adjustments, changes may be made to the due date for specific assignments.
- Late homework may be corrected, and may be counted for half credit, if complete.

Homework over a week late will not be accepted.

Homework will not be accepted after the last class period of the semester.

- A selection of homework problems will be selected for grading using the following scale:
3 pts. - all correct, 2 pts. - mostly correct, 1 pt. - mostly incorrect, 0 pt. - no substantial effort.
- No make-ups for in-class lecture quizzes.
- There is a zero tolerance policy concerning plagiarism. Refer to the Student Handbook² if there is any question as you do papers and homework for any class.
- The in-lab tests are closed-book and closed-notes.
- **The Final Exam is a comprehensive, no notes allowed, in-class exam.**
- Only **ONE** make-up test is allowed. Permission **must be** requested in advance of the scheduled test.

Grading Scale

Letter Grade	Grade Point	Percentage
A	4.0	90 and above
B	3.0	80-89
C	2.0	70-79
D	1.0	60-69
F	0.0	59 and below

(The instructor may curve at her discretion)

² See <http://www.gccaz.edu/catalog/> P. 339
Prepared: January 11, 2012

Minimum Expectations

1. Read the textbook before class. Class time is for discussing ideas (not presenting them), to answer questions, to clarify points of confusion, to demonstrate physical phenomena and process, and to practice doing physical science while getting feedback from the instructor.
2. Attend class. If you miss class, please let your instructor know. Also, you should recopy the lecture notes by hand from any lectures you miss.
3. Memorize the formulas. If you know the formulas before you start your homework, it will help you solve the problems. Also, put away your formula sheet when you are studying for the tests.
4. Be honest. Cheating on tests is not tolerated. **The minimum penalty for cheating on a test is a grade of zero for the test.**

Laboratory Information and Policies

The lab % must be greater than 60% in order to pass³ the course. A completed lab includes, but is not limited to, attendance in lab, performance in lab (collect and analyze data, perform calculations, answer questions), and a satisfactory lab report by the end of that lab period.

If you absolutely have to miss a lab inform your lab and lecture instructors ahead of time by email. **You may only make up one missed lab.** In order to make up a missed lab, a research paper is required (see Lab Make-up Policy below for details). There is no formula quiz make-up.

Lab Make-up Policy

If a lab is missed, the make-up shall consist of a paper subject to the following requirements:

1. Both the lab and lecture instructor must approve the topic of the paper.
2. Body is 5 pages in length, double-spaced, 12 font, Times New Roman, standard 1" margins
3. Make a works cited page with a minimum of three sources.
4. Include one copy of one page from each source
5. Due date for the paper is 2 weeks after the missed lab. If the missed lab is less than two weeks before the end of the semester, the paper is due on the last class day.

Laboratory Procedures and Expectations

Labs will start on time. Be on time. MAKE SURE YOU HAVE THE CORRECT LAB DOCUMENTS.

No study time for formula quizzes at the start of lab.

Formula quizzes will be given in the first 10 minutes of the lab only.

Lab reports will consist of the following:

1. **Data on the data sheets provided or in neat, tabular format on a separate sheet of paper.**
2. **Calculations are to be done neatly and separately. Be sure to indicate exactly what the calculation is for.**
3. **Questions answered on pages provided in the lab report.**
4. **Students will remain in lab until dismissed by the instructor. Lab reports are due at the end of the lab period.**

As stated above, the lab % must be greater than 60% in order to pass the course.

³ See www.maricopa.edu/publicstewardship/governance/adminregs/students/2_3.php#grading

Formula Quiz Schedule

Note that all formula quizzes are cumulative -- any formula from a previous week is fair game!

Week 1	No Formula Quiz
Week 2	No Formula Quiz
Week 3	FQ#1: WHAT IS SCIENCE?
Week 4	FQ#2: MOTION
Week 5	FQ#3: ENERGY
Week 6	Test 1 (Ch 1 – 2) No Formula Quiz
Week 7	FQ#4: HEAT AND TEMPERATURE
Week 8	FQ#5: ELECTRICITY

SPRING BREAK

Week 9	Test 2 (Ch 3 – 4, 6) No Formula Quiz
Week 10	FQ#6: ATOMS AND PERIODIC PROPERTIES
Week 11	No Formula Quiz
Week 12	FQ#7: CHEMICAL REACTIONS
Week 13	Test 4 (Ch 8 - 11) No Formula Quiz
Week 14	FQ#8: NUCLEAR REACTIONS
Week 15	FQ#9: SUPERQUIZ – Know ALL Formulas

Template for Sports Reports

Use template on Blackboard – under Course Materials

Sport:

Date and Time:

Location:

Each sport uses different concepts and laws of physics. See how much of the following you can spot. Describe fully what you see and give as many details as you can.

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1. A LENGTH IN METERS AND A TIME IN SECONDS
2. A SPEED AND A VELOCITY
3. A HORIZONTAL ACCELERATION
4. A VERTICAL ACCELERATION
5. NEWTON'S FIRST LAW – INERTIA
6. ADDITION OF TWO VECTORS Draw a diagram.
7. A ZERO RESULTANT VELOCITY Draw a diagram
8. NEWTON'S SECOND LAW $A=F/m$
9. A FORCE
10. A WEIGHT AND A MASS State units of each.
11. NEWTON'S THIRD LAW State the Action and Reaction forces.
12. MOMENTUM
13. CONSERVATION OF MOMENTUM Draw a diagram.
14. KINETIC ENERGY
15. POTENTIAL ENERGY
16. CONSERVATION OF ENERGY
17. THE FIRST LAW OF THERMODYNAMICS

Course Description

“Survey of the principles of physics and chemistry.” Class Schedule

Supplies

Notebook/paper, scientific calculator (TI-30X or similar), graph paper, pencil, text and lab manual on CD

Support Services

1. The Center for Learning⁴ (623 845-3812) provides free tutoring services.
2. Physical Science Assist in the Physical Science Building. Physical science faculty offer help with homework and course content. This semester’s hours are at www.gc.maricopa.edu/appliedscience/physciweb/physciassist.html
3. The Math Solution⁵ (623 845-3813) offers free math and calculator help.
4. The Writing Center⁶ (623 845-3480) offers writing help. It is located in HT2-107, one of the offices on the floor of the Pit (Computer Commons) along the south edge of High Tech Center 2. It is easily identified by the gold filigree decoration mounted above the door.

Course Competencies

1. Apply appropriate problem solving techniques to physical phenomena to develop hypotheses, design experiments, collect and analyze data, and to draw inferences from the evidence.
2. Effectively communicate qualitative and quantitative information orally and in writing.
3. Explain historical and current contexts for the principles and applications of physics and chemistry.
4. Explain the application of fundamental physical and chemistry principles to various physical phenomena.
5. Work effectively in collaborative groups to solve practical and meaningful problems.

Attendance Policy

Class attendance is required. On the second unexcused absence the instructor MAY withdraw the student. Students must be present on all in-class test and final exam days. There will be NO make-up lecture quizzes. It is the each student’s responsibility to become familiar with GCC policy regarding withdrawal and incompletes.

Withdrawal

Students bear the responsibility of notifying the Office of Admissions and Records when they discontinue studies in a course or at the college. Please refer to the Withdrawal Procedures in the General Catalog & Student Handbook. It is the student’s responsibility to withdraw from the course. **The instructor WILL NOT automatically withdraw a student with excessive absences.**

Official Absences “Official absences are those which occur when students are involved in an **official activity of the college** (i.e., field trips, tournaments, athletic events). Students must present an Official Absence Excuse form. Absences for such events shall not count against the number of absences allowed by an instructor or department. Students who must miss a class for an official reason must obtain an official absence verification card from the appropriate dean or associate dean and present it to the appropriate instructor(s) before the absence. Prior arrangements must be made with each instructor for make-up work. If prior arrangements have been made, the student will not be penalized. Other official absences include **jury duty** and **subpoenas** . Appropriate documentation will be required. Prior arrangements must be made with each instructor for makeup work. If prior arrangements have been made, the student will not be penalized. In the event of the **death of an immediate family member** , absences for periods of up to one week will not be counted against the number of absences allowed by an instructor or department. Students should contact instructor(s) as soon as possible to arrange for make-up work. Appropriate documentation will be required (for example, a copy of the obituary or funeral program).”

⁴ www.gc.maricopa.edu/cfl/studyskills

⁵ www.gc.maricopa.edu/math/mathsolution.htm

⁶ www.gc.maricopa.edu/English/writingcenter/

Other Absences

If a student must be absent because of work, family emergency or illness the instructor will work with the student to allow him/her to catch up with the assignments. “Students shall have the right to observe major religious holidays without penalty or reprisal by any administrator, faculty member or employee of the Maricopa Community Colleges. Absences for such holidays shall not count against the number of absences allowed by an instructor or department. At least one week before the holiday, students shall submit to their instructor(s) a written statement which includes both the date of the holiday and the reason why class attendance is impossible. Prior arrangements must be made with each instructor for make-up work.”

Taping of Classes

Taping of lectures and/or labs is NOT allowed without the express permission of the instructor.

Safety Regulations

Arizona Statute ARS 15-151 specifies that every student, teacher and visitor in community colleges must wear appropriate protective eyewear while participating in or when observing vocational, technical, industrial art activities involving exposure to: molten metals; molten materials; cutting, shaping and grinding of materials; heat treatment; tempering or kiln firing of any metal or any other material; welding fabrication processes; explosive materials; caustic solutions; and radioactive materials.

Disciplinary Action

Disciplinary actions may be imposed on students for misconduct or violation of law and/or college rules and policies. This includes cheating. The policies followed in this course may be found in the Student handbook.

Disabilities

If you have a disability that may have some impact on your work in this class and for which you may require accommodations, you need to notify the Disability Services and Resources Office, located in TDS 100. The phone number is 623-845-3080. You must also schedule a meeting with your lecture and lab instructor(s) during the first two weeks of the semester to discuss your specific disability accommodation.

Food

No food or drinks, except water, are allowed in the classroom or laboratory.

Course content may vary from this outline to meet the needs of this particular group.

COPY OF SYLLABUS ACKNOWLEDGEMENT

Course: **PHS 110**

Semester: **Spring 2012**

Instructors: **Mary Harris PS 112**

Section #:

I acknowledge that I have received a course syllabus for the course/section listed above. I have read the syllabus and understand the attendance, grading and other policies. I recognize that in order to successfully complete this course it may require a further 2-3 out-of-class study hours for each hour spent in class.

Signature: _____

Printed Name: _____

Date: _____

How did you select this course? On-line schedule? Paper schedule?

Did you visit a campus advisor? If so, what assistance did you receive from this person?