PHY 101 – Introduction to Physics (14564, 65067, 14640)

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

14564: MWF 10:00 AM – 10:50 AM in PS 167 (Harris)
65067: TR 8:30 AM – 9:45 AM in PS 175 (Harris)
14640: MW 5:45 PM – 7:00 PM in PS 167 (Mot)
14568: M 12:00 PM – 2:30 PM in PS 169 laboratory (Harris)
14570: M 2:40 PM – 5:10 PM in PS 169 laboratory (Harris)
14572: T 11:30 PM – 2:00 PM in PS 169 laboratory (Raffaelle)
14642: W 7:10 PM – 9:40 PM in PS 169 laboratory (Mot)

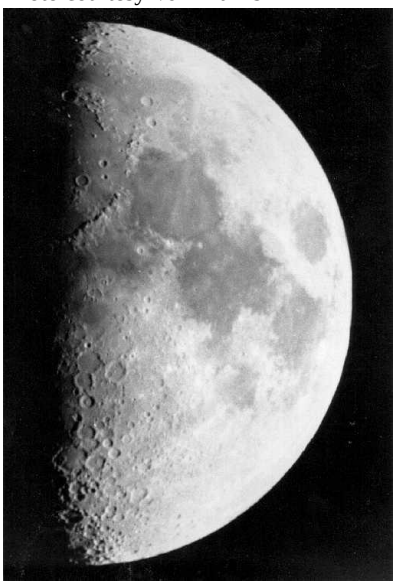
Lecture Instructors: Mrs. Mary Harris, PS 112 and Mr. Mircea Mot, PS 103
Last day for withdrawal without instructor's signature: Friday, October 2, 2009
Last day student initiated withdrawal accepted: Monday, November 30, 2009

Final Exams: ***14564 Monday, December 14, 2009 from 10 AM to 11:50 AM***
65067 Tuesday, December 15, 2009 from 8 AM to 9:50 AM
14640 Monday, December 14, 2009 from 5:45 PM – 7:35 PM

Office Telephone: Harris (623) 845-3445 Mot (623) 845-3894 or 3683
Email: m.harris@gcmail.maricopa.edu or mirceamot@yahoo.com
Web Info: www.gc.maricopa.edu/appliedscience/mjahweb/mjahhome.html
Harris Office Hours: M 11:00 AM – 12:00 PM, T 12:00 PM – 1:00 PM, W 11:00 AM – 12:00 PM, F 11:00 AM – 12:00 PM
Mot Office Hours: MW 5:00 PM – 5:40 PM

Texts: **Inquiry into Physics, 6th Edition, Ostdiek and Bord**
Introduction to Physics Laboratory Manual on CD, 2009

Photo courtesy VJK Harris



"All science is a search for unification. Science as we know it today began when Galileo, Newton and others found links between the motion of bodies on Earth and the movement of the moon and planets. Other landmark connections were the discovery that magnetism and electricity are related to each other, and to light, and Einstein's formula $E = mc^2$, which showed that energy and mass are equivalent. The distinctive feature of science is that it is both broad and deep: broad in the way it tackles all physical phenomena and deep in the way it weaves them, economically, into a common explanatory system requiring fewer and fewer assumptions. No other system of thought can match its breadth and depth." Paul Davies, *Cosmic Jackpot: Why Our Universe is Just Right for Life* (New York: Houghton Mifflin, 2007)

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

Course Outline

Week	Lecture	Assigned Homework	Lab
1 (8/24)	Motion I	**Ch 1** Questions: 9,11,12,14 Problems: 1,5,11,12	1. Units, Measurements & Graphs
2 (8/31)	Motion II	**Ch 1** Questions: 16,17,20,23 Problems: 21,25,27,29	2. Linear Motion FQ#1: MOTION
3 (9/8) **9/7 Labor Day – No Class**	Newton I	**Ch 2** Questions: 8,10,16 Problems: 3,5,8,11,13	**No Lab**†
4 (9/14)	Newton II	C**h 2** Questions: 18,23,29 Problems: 15,17,19,25	3. Acceleration of Gravity FQ#2: ISAAC NEWTON
5 (9/21)	Energy	**Ch 3** Questions: 4,8,19,21 Problems: 1,5,7,11,13,17,21,33	**Test 1 (Ch 1 – 2)**
6 (9/28)	Matter	**Ch 4** Questions: 11,16,20,22 Problems: 1,7,14,19,21,25,27	4. Newton's Second Law
7 (10/5)	Temperature	**Ch 5** Questions: 3,9,12,15,16,17,27 Problems: 3,5,7,8,9,11,16	5. Conservation of Energy FQ#3: ENERGY + MATTER
8 (10/12) **Test 2 (Ch 3 – 5) Take-Home Test**	Waves and Sound	**Ch 6** Questions: 1,3,9,10,17,23 Problems: 4,8,9,11,13,20,22	6. Specific Heat FQ#4: TEMP + HEAT
9 (10/19)	Electricity	**Ch 7** Questions: 1,7,9,16,24 Problems: 1,4,6,8,13,19	7. Wavelengths & Speed of Sound
10 (10/26)	Electromagnetism	**Ch 8** Questions: 1,10,14,20,27,32 Problems: 1,3,6,7	8. Ohm's Law/ Energy Usage FQ#5: WAVES + ELEC.
11 (11/2)	Optics I	**Ch. 9** No homework assigned	**Test 3 (Ch 6 - 8)**
12 (11/9) **11/11 Veterans Day – No Class**	Optics II	**Ch. 9** Questions: 6,9,16,23,25,46 Problems: 1,4,7,8,11,12	**No Lab**†
13 (11/16)	Atomic Physics	**Ch 10** Questions: 1,5,6,19,21,25 Problems: 2,4,5,9	9. Images formed by Lenses FQ#6: E & M
14 (11/23) **11/26,27 Thanksgiving – No Class**	Nuclear Physics I	**Ch 11** No homework assigned **Test 4 (Ch 9 – 10) Take-Home Test**	10. Diffraction/Wavelengths FQ#7 OPTICS
15 (11/30)	Nuclear Physics II	**Ch 11** Questions: 1,5,6,9,16,21 Problems: 1,2,4,6,8,11,14	11. Density/Diameter of Mol. FQ#8: ATOMS & NUCLEI
16 (12/7)	Semester Review		12. Radioactive Half-Life FQ#9: SUPERQUIZ
17 (12/14)	**Final Exam Week**		

† **Faculty are available for help in their offices during scheduled lab times.**

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 physics.

- Homework is due at the beginning of Monday/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.
- There is a zero tolerance policy concerning plagiarism. Refer to the Student Handbook if there is any question as you do papers and homework for any class.
- Two of the four tests during the semester are take-home tests. Take-home tests are open book and are a collaborative effort. The in-class/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

(An instructor may curve at his/her discretion)

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 physics 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 pass[1] the course. A completed lab includes, but is not limited to: attendance in lab, performance of the 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 separate sheets of paper or on pages provided.**
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.

[1] **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 FQ#1: MOTION
Week 3 No lab No Formula Quiz
Week 4 FQ#2: ISAAC NEWTON
Week 5 **Test 1 (Ch 1 – 2)** No Formula Quiz
Week 6 No Formula Quiz
Week 7 FQ#3: ENERGY AND MATTER
Week 8 FQ#4: TEMPERATURE AND HEAT
Week 9 No Formula Quiz
Week 10 FQ#5: WAVES AND ELECTRICITY
Week 11 **Test 3 (Ch 6 - 8)** No Formula Quiz
Week 12 No Lab No Formula Quiz
Week 13 FQ#6: E & M
Week 14 FQ#7: OPTICS
Week 15 FQ#8: ATOMS AND NUCLEI
Week 16 FQ#9: SUPERQUIZ – Know ALL formulas

Other Important Stuff

Course Description
"A survey of physics emphasizing applications of physics to modern life. Designed for students who need a course in physics in order to understand the physical basis of modern technology." 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 Learning[2] (623 845-3812) provides free tutoring services.
2. Physics Science Assist in the Physical Science Building. Physics faculty offer help with homework and course content. This semester's hours are at http://www.gc.maricopa.edu/appliedscience/physweb/phys.asst.html
3. The Math Solution[3] (623 845-3813) offers free math and calculator help.
4. The Writing Center[4] (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.

[2] www.gc.maricopa.edu/cfl/studyskills
[3] www.gc.maricopa.edu/math/mathsolution.htm
[4] www.gc.maricopa.edu/English/writingcenter/

Course Competencies

1. Apply the scientific method and other critical thinking models to physical phenomena for hypotheses development, experimental design, data acquisition, and data analysis
2. Write accurate and meaningful reports analyzing experiments, both qualitatively and quantitatively.
3. Explain historical and current contexts for the principles and applications of physics.
4. Explain the application of fundamental physical principles to various physical phenomena.
5. Estimate realistic values for practical problems.
6. Apply logical, efficient, and effective problem solving techniques using graphical, mathematical, and written communications.
7. Work effectively in collaborative groups.
8. Solve practical and meaningful problems that closely represent real world physical situations.

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)."

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: **PHY 101** Semester: **Fall 2009**

Instructor: **Mary Harris PS 112 or Mircea Mot PS 103** Section #:

I acknowledge that I have received a course syllabus and a lab CD 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?