**Marshall University**

**Physics Department**

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| Course Title/Number  | **PHY 203** |
| Semester/Year | Summer 2014 |
| Days/Time | MWTRF 10:00-11:45 |
| Location | SCI 277 |
| Instructor | John Winfrey |
| Office/Hours | SCI 255 M-F 12:00-12:45 |
| Phone | 304-696-2755 |
| E-Mail | winfreyj@marshall.edu  |
| ***University Policies******Instructor Policies*** | **By enrolling in this course, you agree** to the University Policies listed below. Please read the full text of each policy be 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> 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. **Inclement Weather Policy**: This course will comply with Marshall University’s rules for inclement weather. Please reference the Marshall University website, if questionable weather conditions exist, to determine if class will be meeting. General Emergencies: <http://www.marshall.edu/emergency/>MU Alert Sign Up: <http://www.marshall.edu/emergency/mualert/> **Midcourse corrections**: Information in this syllabus was, to the best knowledge of the instructor, considered correct and complete when distributed at the beginning of the term. The instructor, however, reserves the right, acting within policies and procedures of Marshall, to make changes in the course content and/or instructional techniques during the term without notice or obligation.**Student Conduct**: Student rights and responsibilities are outlined in the Marshall catalog, page 34. Especially, the infractions and violations listed under "Conduct, Rights and Regulations" will be enforced in this class. Students who disrupt class may be removed from class (failing all of the activities for the day) on a daily basis, as warranted, by the instructor. Continuing behavior problems will result in an instructor drop of the offending student. **Cell Phones**/Ipad/anything electronic must be off during class. The only exception is if you are “on call”, like baby watch. Then, if an emergency call comes through, please leave the class before you answer it. If during an EXAM, ANY of these devices are “on” or “visible”, they belong to me and you get a zero (0) on that exam***.***  |

**Web Enhanced: MUOnline**

**Online Homework**: **http://www.sapling.com**

**Course Description: From Catalog**

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| Introduction to Physics for Science Professionals. Includes: motion, forces, gravitation, energy conservation, momentum conservation, rotational motion, torque, vibrations and waves, and thermodynamics.  |

The table below shows the following relationships: How each student learning outcomes will be practiced and assessed in the course.

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| **Course Student Learning Outcomes**  | **How students will practice each outcome in this Course** | **How student achievement of each outcome will be assessed in this Course** |
| Students will  | Solve physical problems involving matter in motion (trajectories) in one- and two-dimensions; solve problems in static and dynamic equilibrium; implement work, energy and momentum as calculational tools; rotational kinematics and dynamics; all using the mathematical tools from algebra, trigonometry, solid geometry, and vectors. | Group Work, Homework, Quizzes, Examinations |
| Students will  | State in words and in formulas functional relationships in physical science. Interpret equations found in reference books and identify *limitations* applying to those equations. Properly implement an equation found in a reference book (including the text book) to a physical problem of interest. | Group Work, Homework, Quizzes, Examinations |
| Students will  | Apply physical principles to everyday life problems. | Examinations |
| Students will | Demonstrate the ability to work effectively as a team member. | Group Work |

**Required Texts, Additional Reading, and Other Materials**

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| 1. College Physics (9th Ed.), Young.
2. SAPLING access card.
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**Grading Policy**

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| Evaluation Method: Total Points Accumulated. The following point-values will apply to the course components:Midterm Tests (3@30 points each) 90 ptsFinal Examination 50 ptsHomework 10 ptsIndividual Quizzes 5 ptsGroup Work 5 pts**Total Possible 160 pts** |

***Notes:***

***Student Characteristics vs. Rewards*:** The "C" student will be able to mostly 'follow' problems worked in class and be able to 'reconstruct' the assigned homework problems; the "B" student will be able work these same problems with minor to major 'twists' in them; the "A" student will be able to work these problems in entirely new situations and to synthesize a combination of problem skills from various areas/topics/chapters within the course.

The "C" and "B" student will work all the homework Exercises assigned; the "A" student will work additional Problems within each chapter**.**

Examinations: You will be given three (3) midterm tests. There will also be a mandatory comprehensive final examination.

I believe in the value of returning your examinations to you so that you may further learn from what you have achieved (and not achieved). Therefore, I will require that on the day I return them, you must within the hour submit in writing on the front page of the examination any questions, rebuttals, or grading-dispute that you have about that examination.

I will not discuss this personally at that time, but take them home for consideration after a good dinner (when my understanding and mercy level is highest). I will post 'my' solution to exams on MUOnline a day after I pass back examinations

Under no circumstances will I reconsider any re-grading of your examination after this solution has been distributed and/or the examination has left the room for any reason.

Do not expect simple plug 'n chug problems! Problems will synthesize concepts from several relevant chapters.

**Homework**: You will submit your answers to homework problems via SAPLING.COM.

* Work the Tutorials on SAPLING for each chapter when we have completed it.
* Work through assigned problems. Enter your results in SAPLING. It will adjust the given constants randomly so that you can just not give numerical answers to your class mates. This process should be done by yourself, as it is the pre-test that will tell you if you are ready for THE TEST. Cramster doesn’t help, since you cannot use it on an exam. No pain, no gain. ALWAYS, feel free to stop by my office and discuss these problems. I may only give you the next hint, and send you back to struggle more.

I insist that, if you omit doing these homework exercises, you will not pass the examinations. I also suggest that if you merely look at the solutions and say "yea, yea", you will not fare well in the course. Doing problems (producing solutions from scratch) and seeing solutions are very different skills. So bleed a lot before you look at the solutions.

**Individual Quizzes**: The information and skill burden of this class is intense! You will not survive if you do not pre-read the textbook material in a timely fashion, and if you are not prepared to engage in active problem-solving during class periods. I know how to do these problems. The point of the course is for you to learn to work them.

Therefore, with each new chapter (syllabus schedule should guide you about this)), I will give (during the first 5 minutes of the class period) an individual quiz on CONCEPTUAL material of the chapter due to be discussed that day (follow your syllabus). This will not be a problem to solve, but a short-answer question to determine if you made an honest effort to pre-read the text materials assigned.

**Group work**: There will be in-class group-problems to solve to accomplish several tasks. I suggest you find your own groups to sit with, and then about mid-term change groups, so that you are exposed to the problem-solving skills of the entire class by the end of the term.

The purpose of these groups: This class is primarily aimed at producing critical-thinking skills, group membership/cooperation skills, and problem-solving skills. These group and problem-solving skills are taught primarily to prepare you for upper-division, and possibly graduate work, in a scientific area.

Watching me work problems is of limited utility (although many of you will disagree initially). You will learn problem-solving only by DOING problem-solving, and by BEING CRITIQUED by your group and by the instructor in a non-threatening setting.

The goals of these groups are to:

1) Prepare your group members for individual testing

2) Expose you to the full diversity of problem-solving skills that reside in your class members

3) Provide practice 'producing' and 'presenting' solutions to your classmates (the skill you need for tests)

4) Prepare you to go home and solve the homework problems as an individual.

**CLASS PROCEDURES**

**Standards:**

1) Quizzes, Group Work, and Individual Exam Problems will each be graded on a 0 to 10 point scale, so that you can readily check your progress (see standard scale below). These category points will be scaled (at the end of the term) to the total category point values stated above.

You may monitor your progress in the course by observing the following general guidelines as applied to each graded assignment:

 9-10 A

 8-9 B

 7-8 C

 6-7 D

 0-5 F

2) Exams are usually graded as points-out-of-problem-total. For each problem, the 'A' solution (9-10) will be complete in all its parts, correct except for minor mathematical or arithmetic errors, have the correct units; the 'B' solution (8+) will be initiated correctly, mostly completed, but the solver will have encountered some more serious mathematical, physics, or conceptual problem along the way; the 'C' solution (7+) will have begun with the appropriate equation(s), but failed to follow through into the complete solution, or not have been completed; the 'D' and 'F' solutions (below 7) will be blank, state an equation and then quit, contain equation salad (a listing of several equations containing a 'v' because I gave one in the problem, hoping I can find the truth in the midst of the shotgun blast), or show other signs that the student was totally lost.

**Other Course Expectations**:

I expect the following routine student conduct:

* Read assigned textbook materials before the class in which they will be covered
* Do, to the best of your current ability, the homework and other assignments
* Attend all class and other sessions
* Be prepared to ask questions and participate in discussions; you will learn as much from each

other as you do from the instructor.

**TENTATIVE SCHEDULE**

**PHYS 203, Summer 2014**

J 14-17 Intro, CH 17 (§ 1-7, 9) Electric Charge, Electric Force & Electric Field

J 18-21 CH 18 (§ 1-3, 5-8) Electric Potential & Capacitance

J 22 **Exam #1**

J 23-25 CH 19 Direct Current Circuits

J 28-29 CH 20 (§ 1-9) Magnetic Force & Field

J 30-31 CH 21 (§ 1-5, 9, 11-12) Electromagnetic Induction

A 1 **Exam #2**

A 4 CH 22 (§ 3,5) AC Current

 CH 23 (§ 1-3, 6-9, 11) Electromagnetic Waves

A 5-7 CH 24 Geometric Optics

 CH 25 (§ 3, 5-7) Optical Instruments

A 8-11 CH 26 (§ 1-6, 8) Interference & Diffraction

A 12 **Exam #3**

A 13 CH 28 (§ 1-3, 6-8) Photons, Electrons, Atoms\*

 CH 29 (§ 1-3) Atoms, Molecules, Solids\*

A 14 CH 30 (§ 1-7, 10) Nuclear & High Energy Physics\*

A 15 **Final Exam 10:00-11:45**

**\* These topics will only be tested on the Final Exam. The questions will be conceptual (1/2 page short answer).**