**Marshall University**

**Physics Department**

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| Course Title/Number | **PHY 211** |
| Semester/Year | Spring 2014 |
| Location | SCIENCE 277 |
| Instructor | John Winfrey |
| Office | SCIENCE 255 |
| Phone | 304-696-2755 |
| E-Mail | [winfreyj@marshall.edu](mailto:winfreyj@marshall.edu) ***please put PHY 211 in the subject line of emails*** |
| Office/Hours | MWF 10:00 – 10:50; MWF 2:00-2:50 |
| 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 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>  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/>  **Policy for Students with Disabilities:**  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 disability.  The DSS will then contact me. For more information, please visit [http://www.marshall.edu/disabled](https://outlookweb.marshall.edu/owa/redir.aspx?C=b4d031e09db84f74a2d4d8b6237e5b2e&URL=http%3a%2f%2fwww.marshall.edu%2fdisabled) or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271.”  catalog.  **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 Phone**/Ipad/anything electronic: Telephones may be set to vibrate during regular class times. If an **emergency** call comes through, please leave the class before you answer it. Otherwise, just enjoy the vibration. 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***.*** |

**Course Description: From Catalog**

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| A course in the basic principles of physics for Physics, Mathematics, and Engineering majors. 4 hrs lecture.  (CR: MTH 229 and PHY 202) |

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, calculus, 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. University Physics with Modern Physics (13th Ed.), Young & Freedman. 2. WebAssign ***student* access code**. |

**Web Sites**

**MUOnline:** [**http://www.marshall.edu/muonline/**](http://www.marshall.edu/muonline/)

**Use your MyMU UN & PW. Many, many essential resources here**

**Online Homework:** [**http://www.webassign.net/**](http://www.webassign.net/)

***Class* Key: marshall 7260 3002**

**Grading Policy**

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| Midterm Tests (3@20 points each) 60 pts  Final Examination 40 pts  Homework 10 pts  Individual Quizzes 10 pts  Group Work 10 pts  Diagnostic Tests (2@ 3pts) 6 pts  **Total Possible 176 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) within-term Exams. There will also be a mandatory comprehensive Final Examination. The material after Exam 3 is optional and mostly conceptual; we will get as far as we can, without whipping through the previous material at near light speed. The goal is to learn as deeply as possible. You can expect one of the Final Examination questions to be a 1-page essay on one of the optional topics we cover.

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

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 on the 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.**

***Homework*:** At the end of this syllabus is a tentative class schedule. You are assigned problems in your text & tutorials, you will submit your *answers* to homework problems via Webassign: <http://www.webassign.net/>

I suggest near the completion of each chapter you:

1. Carefully process through the tutorial.
2. Work the text problems out on paper the old fashioned way IN SYMBOLIC FORM.
3. Enter your results in Webassign. For those with numerical constants, it will adjust the given constants randomly so that you cannot just 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. As you enter results on Webassign, it will tell you if you are off-track immediately. You can use hints; you can put off entering **this** problem until you have had more time to think about it. You have three submission attempts.
4. Cramster & CHEGG 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 will post solutions to the homework on MUOnline after the chapter due date. I suggest that, if you omit doing these exercises, you will not pass the examinations. I also suggest that if you merely look at the solutions and say "yeah, yeah", 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, nearly weekly (or with each new chapter), I will give (during the first 5 minutes of the class period) an individual quiz on *content 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.

Quiz & Group Work Grading:

So that you get instant feedback as to how you are doing, these assignments will be graded on the following scale (0 – 10):

10 Perfect

9 Minor problems, annotated

8 More serious problems, annotated

0 You missed the point entirely! It is now your responsibility to re-work this activity,

because it is prime fodder for exams.

**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 211, Spring 2014**

Week 1 J 13-17 Intro, CH 1 Problem Solving, Units, Vectors

Week 2 J 22-24 CH 2 1-D motion

Week 3 J 27-31 CH 2 cont.

Week 4 F 3-7 CH 3 2-D, 3-D motion

Week 5 F 10-14 CH 4 Newton’s Laws, Equilibrium

Week 6 F 17 **Exam #1**

F 19-21 CH 4 cont., CH5 Dynamics I

Week 7 F 24-28 CH 6 Energy

Week 8 M 3-7 CH 7 Mor’On Energy

Week 9 M 10-14 CH 8 Momentum

Week 10 M 24 **Exam #2**

M 26-28 CH 9 Rotation

Week 11 M 31-A4 CH 10 Dynamics II

Week 12 A 7-11 CH 11 Equilibrium (Statics) II

Week 13 A 14-18 More of the same

Week 14 A 21 **Exam #3**

**The remainder of the course will be mostly conceptual. These topics will be tested only on the Final Exam (one, one-page essay), as far as we get.**

A 23-25 CH 14(§1-5, 8) Periodic & Wave Motion

CH 15 (§1-4, 6-7), CH 16 (§1-2, 4-8)

Week 15 A 28-M 2 CH 17 (§1-5, 7), Thermodynamics\*

CH 18 (§1, 3, 5), CH 19 (§1,4), CH 20 (§1-2, 4-7)

Week 16 M 5 (Wednesday) **Final Exam** 3:00-6:00

**Assigned Tutorials**

These should be done **FIRST**.

You will go to the web page: <http://www.wwnorton.com/college/physics/om/_content/_index/tutorials.shtml>

and work through the tutorial assigned. Then answer a question on WebAssign from that content.

I CANNOT STRESS ENOUGH, THESE ARE ESSENTIAL TO UNDERSTAND CONCEPTUALLY THE MATERIAL AND TO PROBLEM-SOLVE.

**Text Chapter Web Page Applet**

1. Unit Conversion, Significant Digits
2. Acceleration
3. Projectile Motion
4. Forces, Friction
5. Free Body Diagrams
6. Work of a Variable Force
7. Conservation of energy
8. Momentum in Collisions, Elastic & Inelastic Collisions
9. Rotation About a Fixed Axis
10. Oscillations & Simple Harmonic Motion

14 Wave Superposition, Doppler Effect

**Assigned Homework from Text**

These should be done **SECOND**, on scratch paper. When you think you’ve “got it”, enter your answer on WebAssign. If your answer is wrong, you have three tries to get it right: go back to the drawing board.

CHAPTER PROBLEMS

CH 1 9, 12, 20, 24, 27, 33, 36, 37, 57, 67, 72, 75, 85, 88, 97

CH 2 2,5,8,10,13,14,18,20,23,29,32,34,37,42,44,48,52,63,68,71,80,88,92,94

CH 3 4, 7, 10, 14, 19, 22, 29, 35, 38, 42, 49, 52, 60, 65, 67, 71, 75, 80, 85

CH 4 2, 4, 8, 11, 15, 23, 28, 34, 39, 53, 57, 59

CH 5 4,7,13,17,20,22,27,31,38,42,46,52,58,59,63,72,73,77,89,93,97,100,102,112,117,119

CH 6 7, 12, 15, 22, 24, 27, 41, 45, 53, 66, 71, 73, 75, 80, 85, 87, 99

CH 7 5, 9, 10, 24, 30, 31, 37, 39, 41, 50, 54, 56, 61, 66, 67, 76, 77, 86

CH 8 10, 14, 19, 22, 25, 26, 30, 34, 40, 50, 65, 72, 73, 79, 85, 95, 104, 106, 110

CH 9 4, 7, 17, 35, 41, 47, 64, 73, 77, 80, 87, 89

CH 10 1-3, 12, 15, 20, 24, 28, 35, 37, 45, 49, 51, 59, 62, 69, 71, 76, 79, 85, 87, 94, 97

CH 11 4, 10, 13, 19, 20, 45, 46, 50, 56, 64, 69, 79, 82