**PHY 202 Syllabus (1 Credit hours)**

*Marshall University – College of Science – Department of Physics*

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| Course Title & Number | General Physics Laboratory / PHY 202 |
| Semester & Year | Fall Semester 2018 |
| Instructor | Maria Babiuc Hamilton |
| Phone & Email | 304-696-2754/ babiuc@marshall.edu |
| Lecture Days & Time | Friday from 1:00 pm to 2:50 pm |
| Lecture Location | SCI 100 |
| Office Hours | Open door: MWF 3:00 pm – 4:00 pm  *If the scheduled office hours don’t work for you, please send me an email to reschedule. I will try to accommodate all your requests.* |
| Office Location | SCI 257 |
| University Policies | By enrolling in this course, you agree to MU Academic Affairs: University Policies. Please read the full text by going to: [www.marshall.edu/academic-affairs/policies](http://www.marshall.edu/academic-affairs/policies) |
| Emergency Policies | General Emergencies: [www.marshall.edu/emergency](http://www.marshall.edu/emergency)  MU Alert Sign Up: [www.marshall.edu/emergency/mualert](http://www.marshall.edu/emergency/mualert) |
| Disabilities Policies | For University policies and the procedures for obtaining services, please go to <http://www.marshall.edu/academic-affairs/policies/> and read the section: **Students with Disabilities** |
| Instructor Policies | **Course 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. 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.  **Cell Phones/Tablets** may be set to vibrate during regular class times, but they cannot be used. If an emergency call/message comes through, students are required to leave the class before answering the phone it.  CELL PHONES ARE STRICTLY PROHIBITED DURING EXAM! |

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| **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 learn to simplify nature to extract patterns and understand the laws of physics. | Students will perform experiments in order to understand motion, conservation laws, energy, properties of matter, oscillations and waves. | Group Work, Lab Reports, Homework, Examinations. |
| Students will employ basic mathematical tools to calculate physical quantities from experimental data. | Students will engage in all the hands-on activities during the lab, following closely the instructions from the lab reports. | Group Work, Lab Reports, Homework, Examinations. |
| Students will demonstrate the ability to think critically in order to identify the sources of experimental errors. | Apply physical principles to everyday life problems, employ critical thinking skills to solve problems. | Group Work, Lab Reports, Homework, Examinations. |
| Students will understand how science operates and how to link of theoretical models with reality. | Demonstrate the ability to work effectively. Read and interpret graphs and data, being able to fit existing data and predict new data. | Group Work, Lab Reports, Homework, Examinations. |

**Other Course Expectations**

This is a hands-on class, where students will work in teams and learn physics by doing. The experiments cannot be reproduced at home; therefore, all students are expected to attend and to actively participate in all the classes. An attendance record will be strictly maintained. Each week there will be another lab set up on the table. If you miss one class, plan to make up your lab in the same week. Students with absences will still have to turn in the lab and conclusions, otherwise they will receive a 0 (zero) for that lab. There will be a penalty of 5% of the lab grade for each day of turning the lab late. Students with excused absences will not be penalized. The labs take about 90 minutes to complete. Students can leave the lab earlier than that only if they completed all the activities. Before you leave, you need to secure my signature on your lab report, to acknowledge that you did all the work in class. **Do not leave without my signature! This is a proof of your work!**

**Required**

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| Textbook | Physics 202 Laboratory Manual |
| Lab Reports | *Due one week after each experiment is performed* |

**Course Description**

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| This is a laboratory course to accompany the lecture course PHY 201 or PHY 211. |

**Grading Policy**

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| Breakdown   |  |  | | --- | --- | | Lab Reports | 50% | | Exam 1 | 25% | | Exam 2 | 25% | | Total Possible | 100% | | Grades   |  |  | | --- | --- | | A | 90% -100% | | B | 80% - 89.9% | | C | 70% - 79.9% | | D | 60% - 69.9% | | F | 59.9% and below | |

**Grading Specification**

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| Lab Exams | There will be two exams, each one consisting of problems from the homework and conceptual questions from the experiments covered in class. Each exam is weighed the same, and the last exam is not comprehensive. If you want to raise your grade, or if you did not pass the first exam, you can take the second exam as comprehensive. There will be a 5% extra credit. I will provide a study guide. |
| Lab Reports with homework and Conclusions | Your reports should include all lab manual pages on which data is entered, calculation done, questions answered, homework and the **Conclusions**. Your name and the name of your lab partners must be entered on the first page of the lab report. The labs are collaborative, which means that you have to work through the questions together with your lab partners. The Homework problems and Conclusions are to be done individually, with no collaboration with your partners. The Conclusions must be done on a separate sheet, typed with font size 12, and be about a half page long (250-350 words), which you attach to the report. ***A discussion of the errors is required*** |
| Extra Credit | There will be 5 points of extra credit available on each test, and an optional extra credit homework assignment at the end of the class. |

In order to calculate your grade during the semester, use the ***normalized average***. For example, if you took one test, your grade will be:

(test x 25% + Lab Report x 50%)/(75%).

Date: Experiment:

Aug. 20 – 24 Lab 1: Static Force Vectors

Aug. 27 – 31 Lab 2: Introduction to Motion

Sept. 4 – 7 Lab 3: Accelerated Motion

Sept. 10 – 14 Lab 4: Mathematical Description of Motion

Sept. 17 – 21 Lab 5: Projectile Motion

Sept. 24 – 28 Lab 6: Force and Motion

Oct. 1 – 5 Lab 7: Circular Motion

Oct. 8 – 12 Lab 8: Work and Energy

**Oct. 15 – 19**  **First Lab Exam: Labs 1 – 6**

Oct. 22 – 26 Lab 9: Collisions

Oct. 29 – Nov. 2 Lab 10: Simple Harmonic Motion

Nov. 5 – 9 Lab 11: Periodic Motion of a Pendulum

Nov. 12 – 16 Lab 12: Longitudinal Waves and Sound

**Nov. 19 – 23** **Thanksgiving Break – No Class**

Nov. 26 – 30 Make-Up Labs/Review Sessions

Dec. 3 – 7 Dead Week

**Dec. 10 – 14** **Second Lab Exam: Labs 7 – 12**

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| **How to write your Conclusions**  You asked a question, you did an experiment, and you did the experiment a second time. You recorded your results. Now it is time to write your conclusion. The conclusion, plain and simple, is the answer to your question. It should be *clear, concise* and *stick to the point*. Resist the temptation to jump to conclusions.  But this is also an opportunity to be reflective about what you learned, the uncertainties remaining, the links to other problems, etc. Before starting writing, ask yourself questions like:   * If you were to do your experiment again, would you get the same results? * Can there be differences? Why? * Ask yourself what happened when you tested your hypothesis. * What have you learned?   Now is time to write a final report summarizing your questions, and your findings:   1. **First paragraph: focus on what you did. Begin with “We have used…”, “We have investigated…”** 2. **Following paragraphs: one major finding per paragraph. First sentence states the finding, following sentences elaborate.** 3. **It is very important to talk about errors, so make sure you include a paragraph about your errors. Explain where your errors might come from, how they affect your data, and how can the errors be reduced.** 4. **Final paragraph should have some forward-looking perspective. Don’t let paper finish on a whimper!** |
| ***Remember to include a discussion of the errors in your Conclusions!*** |

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| S-100 | Monday | Tuesday | Wednesday | Thursday | Friday |
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| 9am |  | PHY 202  9-10:50am  Howard Richards |  | PHY 202  9-10:50am  Sachiko McBride |  |
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| 10am |  | PHY 202  10-11:50am  Staff | PHY 202  10-11:50am  Staff |
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| 1pm |  |  | PHY 202  1-2:50pm  Staff |  | PHY 202  1-2:50pm  Maria Hamilton |
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| 2pm |  | PHY 202  2-3:50pm  Staff |  |
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| 3pm |  | PHY 202  3-4:50pm  Judy Fan |  |  |
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| 4pm |  | PHY 202  4-5:50pm  Sachiko McBride |  |  |
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| 5pm |  |  |  | PHY 202  5-6:50pm  Howard Richards |  |
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