PHYS.1440L Physics II Lab (Fall 2016)

COURSE POLICY

Course Section Info.  
Section number _________ / meeting time _________________

Lab Instructor  __________________________________________________

Office/Email  _____________/____________________________________

Faculty Supervisor ___________________ Dr. Arthur Mittler _______________

Office/Email  __ Olney 137 __/__ Arthur_Mittler@uml.edu _________________

Corequisite Course  PHYS.1410 Physics I

Lab Coordinator  Dr. Mittler (Olney 137, tel. 978.934.3775, email Arthur_Mittler@uml.edu)

Required Materials  
a)  laboratory manual – PHYSICS Laboratory Experiments, revised 8th ed. by Pullen, Mittler & Schier (McGraw-Hill)
b)  scientific calculator
c)  metric ruler (15 to 30 cm long, preferably transparent)
f)  lab notebook (hardbound, with numbered pages)

Room  
See posted notices on lab doors (Olney 103 - 110) or see website listed below.

Attendance  Required for all six lab sessions.

Absences  There will be NO MAKEUPS due to the restrictions of the academic calendar.

Restrictions  Consumption of any FOOD or DRINK is NOT ALLOWED in the lab rooms.

Assistance  Please contact your laboratory section instructor for assistance in the course.

Information  Notices concerning the physics service laboratory courses will be posted in the display cases opposite Olney 111 and on the lab room doors.

Schedules:  
http://faculty.uml.edu/Arthur_Mittler/Teaching/Teaching.aspx

Rooms:  
Click on Lab Announcements

Academic Conduct  
You are responsible for appropriate academic conduct. Please refer to the university's academic integrity policy at:

http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Policies/Academic-Integrity.aspx
COURSE REQUIREMENTS

Pre-lab Assignment

Your instructor will give you a pre-lab assignment for experiments 2-6. This will consist of either an assignment to be completed before coming to laboratory or a pre-lab quiz on the experiment to be performed (given at the beginning of the lab session).

Lab Work

In this course, you will be introduced to a wide range of physical phenomena, measurement techniques and methods of analysis. You will be required to keep a careful record of your observations and measurements in a laboratory notebook and to write a formal report on each of your experiments. Working with a partner will enable you to share the data taking, but each of you should participate in all observations and measurements and check the other’s work for accuracy. You are separately responsible for all measurements taken and should keep independent records in your laboratory notebook – do not simply copy from your partner’s notebook. You are encouraged to discuss your results and learn from each other, but your reports must reflect strictly individual efforts. The Lab Manual Pages with data tables pertaining to the experiment are not part of the lab report – they should stay in the manual or be stapled/ taped to your lab notebook. The data tables will be checked and initialed by the instructor at the end of the lab, and they will serve as proof of your attendance and participation. The information from the data tables should be copied to and presented in the lab report.

All sections (A-G) of the lab report listed on the next page must be stapled together to form the lab report.

All reports are due at the one week from the time the experiment was performed. Check with your laboratory instructor for the procedure for handing in your lab report and any variance from the ‘due’ date.
Lab Report

The lab report must consist of the following 7 parts: A) Cover Page, B) Introduction, C) Apparatus and Procedure, D) Results and Analysis, E) Discussion, F) Conclusions, and G) Questions. You are encouraged to discuss your results and learn from each other, but your reports must reflect strictly individual efforts.

A) Cover Page with Objective(s) (3 pts.)
   - Your Name
   - Course Number and Section Number
   - Instructor’s Name
   - Date Experiment was performed
   - Partner(s)’s Name(s)
   - Title of Experiment
   - Objective(s)
   - Objective(s): One or two sentences describing the primary goal(s) of the experiment.

B) Introduction (7 pts.)
   This should include the underlying theory of the experiment along with all appropriate equations. Each equation should have a brief description with clear definitions of all the variables. Develop any needed derivations including an explanation of your steps.

C) Apparatus and Procedure (10 pts.)
   1. Provide a complete list of the equipment used.
   2. Include a labeled block diagram for each part of the experiment.
   3. Describe briefly how the experiment was performed.

D) Results and Analysis (20 pts.) (two parts)
   1. Results: Provide the data that you have collected during the experiment in terms of data tables and/or graphs. Do calculations as required. Provide a sample calculation for each significant part of your results. Results should be reported with proper units and uncertainties.
   2. Analysis: Analyze and describe your data and results in detail. Refer to the diagrams, data tables, and graphs that represent your data and results. Describe the results in terms of what it means (look for data trends, functional relationships, and consistency of results, etc.).

E) Discussion (10 pts.)
   1. Discuss and explain your results by comparing them with the theory.
   2. Discuss and explain the experimental uncertainties.
   3. Explain any difficulties that you may have had in doing the experiment.

F) Conclusions (5 pts.)
   Your conclusions should summarize (in a few sentences) what can be deduced from your measurements and include a restatement of the experiment’s objective.

G) Questions (5 pts.)
   Answer questions (use complete sentences) and/or present appropriate calculations.
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Grading

Your course grade will be based on the average score of all 6 experiments. Each experiment will carry equal weight.

Your grade for Exp. #1 will be based 30% on the lab work and 70% on the answers to the questions. Your grade for Exp. # 2-6 will be based 10% on the pre-lab assignment, 30% on the lab work and 60% on the lab report.

Grades from all lab sections taught by the same instructor will be “normalized” to ‘85 per cent’ at the end of the semester. The following table will be used to obtain approximate course letter grades from the normalized scores.

<table>
<thead>
<tr>
<th>percent</th>
<th>grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>94 or higher</td>
<td>A</td>
</tr>
<tr>
<td>91-93</td>
<td>A–</td>
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<tr>
<td>88-90</td>
<td>B+</td>
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<tr>
<td>83-87</td>
<td>B</td>
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<td>80-82</td>
<td>B–</td>
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<td>77-79</td>
<td>C+</td>
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<td>72-76</td>
<td>C</td>
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<tr>
<td>68-71</td>
<td>C–</td>
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<tr>
<td>60-67</td>
<td>D</td>
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<tr>
<td>less than 60</td>
<td>F</td>
</tr>
</tbody>
</table>

Late reports must be placed in the box outside of Olney 113. They will be date-stamped at 5:00 p.m. of the day received. Your instructor may assign a penalty of up to 10% per day for late reports. The minimum experiment grade, however, will be 40% if you have completed the experiment obtaining satisfactory data, and you have turned in a data sheet signed by your instructor.