

## **PH 202 College Physics II: Laboratory Syllabus** Winter 2018 ◦ Northern Michigan University

**Instructor:** Dr. P. W. Mengyan   **Office:** West Science 2513   **Phone:** 906.227.2183  
**Email:** [pmengyan@nmu.edu](mailto:pmengyan@nmu.edu) [preferred comm method]. Begin subject line with *PH 202-Lab*:  
**Office Hours:** {M,W} at 11–11:55 & R 10:00–11:55 in WS 2513. Other times by appointment  
**Class Meetings** PH 202-02 [CRN: 10308]: Tues 10:00–12:50 in WS 2603  
PH 202-03 [CRN: 10309]: Tues 14:00–16:50 in WS 2603  
**Webpage:** <http://physics.nmu.edu/~pmengyan> ; Educat [lab only]  
**Required Text:** The Physics department will provide documentation for each lab.  
There is no additional required text for lab.

### **Required Materials:**

One copy of each of the required printed lab material will be provided to the student by NMU Physics. Students will provide their own copy of the textbook, paper, pencil, eraser, and calculator (NOT a cell phone or laptop, an *actual* calculator). The student's NMU issued laptop will also be required for many of the lab activities.

### **Class Meetings:**

Laboratory sections will meet at each student's officially scheduled place and time. Students are *only* permitted to regularly attend sections for which they are *officially* registered. Make-ups for missed labs are *not* possible (see *attendance* section below for more detail on the policy).

Food or drinks in any form (including chewing tobacco, gum, etc) and cell phone (or any other non-approved electronic gizmo) usage are *not* permitted in the lab room.

### **Grading:**

40% – Quizzes  
60% – Lab work (e.g. charts, graphs, participation, post-lab questions, recaps, etc)  
100% – Total Lab Grade Reported to Lecture

### **Laboratory (lab work):**

The laboratory portion will consist of working through the interactive exercises during the class time, which will include activities such as data collection, analysis and answering questions within each exercise. Overall topics include electricity, magnetism and optics. Performance in the laboratory portion is evaluated via in-class [instructor] observation and submitted lab work. The student **MUST** participate in the data collection portion of a lab in order to earn credit for work submitted related to that exercise. Lab work will generally be due at the start time of the next scheduled lab meeting. Any changes to the due date and time for an assignment will be discussed in class. *Late work is not accepted.*

### **Lab Recaps:**

Short, typed statement discussing the highlights of the relevant laboratory exercise. If applicable, students are required to use the format provided by the instructor. Recaps that are hand written (i.e. not typed) or that follow any format other than what the instructor specifies will not be accepted under any circumstances. Equations and diagrams *may* be neatly written in by hand.

### **Quizzes:**

May be administered in the beginning of each class and cover material from the previous lab.

**Participation:**

Punctuality (in your seat and ready to begin by the scheduled start time), not leaving early, being on-task and maintaining a respectful attitude are all examples of what may contribute to the participation grade. Completing physics education research or department assessments (e.g.: general pre-test, post-test or other surveys) may also count toward your participation grade.

Full credit for participation is earned by making a serious effort in completing the assigned activities regardless of the *accuracy* of the particular responses. Participation points may not be earned if equipment is utilized in any form that is not related to the prescribed exercise, fail to take part in group work or are otherwise not on task. Violations of the lab and general class rules may result in dismissal for the class period, reduction in participation grade, forfeiture of any submitted work left incomplete due to the dismissal and, if necessary, reported to the appropriate authorities.

**Attendance:**

Attendance contributes directly to the participation grade as if one is absent one is not capable of participating in a given activity. Absences will be excused for officially sanctioned university events, illness (documentation may be required), court appearances (plaintiff, defendant, witness, juror -- documentation is required), family emergencies (at the discretion of the instructor and may require appropriate documentation). If something occurs that you feel should be grounds for being excused it is your responsibility to contact your instructor, in writing, PRIOR to the absence (if possible, or as soon as possible after the absence) to discuss the situation. Excused absences for situations beyond the purview of NMU policy are at sole discretion of the instructor, will be evaluated confidentially, on a case-by-case basis and confirmed in writing.

An excused absence does NOT necessarily excuse you from completing the work. Arrangements for a planned excused absence, if possible, should be finalized (with written confirmation between the student and instructor) no later than the Friday before the week for which the absence will occur. Otherwise, establish contact with the instructor as soon as reasonably possible.

**ADA Statement**

In compliance with the ADA and university policy

*"If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2101 C. B. Hedgcock Building (227-1700 or [disserv@nmu.edu](mailto:disserv@nmu.edu)). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines."*

**Religious Holiday**

Pursuant to university policy, a student who intends to observe a religious holy day should make that intention known, in writing, to the instructor prior to an absence. A student who is absent from a class, exam or exercise for the observance of a religious holy day shall be allowed to complete an assignment or exam scheduled for that day within a reasonable time around that absence.

### Academic Integrity

Section 2.3.1 of the NMU Student Handbook discusses scholastic dishonesty; all of which will be upheld in all aspects of this course. Academic dishonesty will not be tolerated.

### Appropriate behavior:

Students are expected to behave in a respectful, considerate and courteous fashion in any activity related to this course. Rude, disrespectful or disruptive behavior will *never* be tolerated.

## Physics 202 Laboratory Schedule Winter 2018

| Week | Experiment                    | Description  |
|------|-------------------------------|--|
| 1    | Speed of Sound                | Measurement of the speed of sound in a resonance tube  |
| 2    | Mapping Electric Fields       | Using the electric potential to map electric fields for different charge distributions.                        |
| 3    | Capacitors: Series & Parallel | Using an RC circuit to study capacitor circuit configurations  |
| 4    | Resistivity of a Wire         | Use a balance bridge to accurately measure resistivity   |
| 5    | Resistor Circuits (Ohms Law)  | Introduce circuits. Explore resistor configurations.   |
| 6    | Wheatstone Bridge             | Accurately measure the resistance of a resistor  |
| 7    | Mapping Magnetic Fields       | Map field lines around some common paramagnet shapes   |
| 8    | Electromagnetic Induction     | Study Faraday's and Lenz's law   |
| 9    | RC and RL Circuits            | Measure capacitance & inductance using an oscillator circuit   |
| 10   | Reflection and Refraction     | Investigation into the properties of light in geometric optics with mirrors and both concave and convex lenses |
| 11   | Optics with Thin Lens         | Determine focal lengths and image distances of converging and diverging lenses.                                |
| 12   | Interference and Diffraction  | Explore the wave behavior of light using interference and diffraction  |
| 13   | Heat Capacity & Latent Heat   | Measuring heat capacity and latent heat  |
| 14   | Thermal Expansion             | Investigate the temperature dependence of structural properties of metals                                      |

### Notable dates:

16 Jan 18: First official day of class  
04 to 11 Mar 18: Break (No Class)  
28 Apr 18: Last day of class  
30 Apr to 5 May: Final Exams

| <u>Wk #</u> |   | <u>Start Date</u> | <u>WK #</u> | <u>Start Date</u> |
|-------------|---|-------------------|-------------|-------------------|
| 1           | → | 15 / Jan / 18     | 8           | → 12 / Mar / 18   |
| 2           | → | 22 / Jan / 18     | 9           | → 19 / Mar / 18   |
| 3           | → | 29 / Jan / 18     | 10          | → 26 / Mar / 18   |
| 4           | → | 05 / Feb / 18     | 11          | → 02 / Apr / 18   |
| 5           | → | 12 / Feb / 18     | 12          | → 09 / Apr / 18   |
| 6           | → | 19 / Feb / 18     | 13          | → 16 / Apr / 18   |
| 7           | → | 26 / Feb / 18     | 14          | → 23 / Apr / 18   |