Introductory Physics 2 (PH 221) Lecture Syllabus

Fall 2021 ∘ Northern Michigan University

Instructor:	Dr. P.W. Mengyan ("men-gin") **Office**: West Science 2513 **Phone**: 906.227.2183
Email:	pmengyan@nmu.edu [preferred comm. method]. Begin subject line with "*PH 221:*"
Office Hours:	M,T,R 09:10-10:00; M 12:00-12:50; or email for appointment
Class Meetings:	Lecture (CRN 80339): {M,T,R,F} 11:00 to 11:50 in *West Science 3805*
	Information regarding remote sessions, if available, will be distributed via EduCat
Webpage:	https://www.webassign.net [class key: *nmu 3963 5343*]
Required for HW	Self-enroll with class key. Instructions available at
Includes eBook	http://www.webassign.net/manual/WA_Student_Quick_Start.pdf
	For 'Name', 'Student ID Num' and 'Email', see homework section for instructions
Suggested Texts:	Serway and Jewett, Physics for Scientists and Engineers.
For lecture	(7th edition or later; either with or without 'modern physics' is acceptable)
For Lab	The Physics department will provide documentation for each lab.

Course Description (outline and expected outcomes): This calculus based introductory Physics course will introduce the basics of electricity, magnetism, circuits and optics as well as encourage critical thinking and general problem solving skills. A student who is successful in this class will, for each topic, be able to (i) explain the fundamental principles to a peer and (ii) apply a general problem solving strategy to interpret and write a solution to basic questions. Progress towards these outcomes will be assessed through in-class exams, homework assignments, quizzes, laboratory and discussion exercises. More information is available via the teaching section of the instructor's webpage.

General Education Requirements: PH 221 satisfies the Laboratory Science University Requirement (LAB) and part of the Scientific Inquiry (SCII) requirements. SCII relates to the ability to use of the scientific process to investigate and report knowledge about natural or social phenomena.

Liberal Studies Requirement: (applicable to pre-2017 bulletin): PH 221 satisfies part of the Division III: Foundations of Natural Sciences-Mathematics liberal studies requirement. Students who complete the science courses should be able to recognize and understand the scientific method; understand and use scientific concepts; understand and discuss general scientific articles; and apply their knowledge of science to everyday experience. Students who complete the mathematics courses should be able to demonstrate a basic understanding of mathematical logic; use mathematics to solve scientific or mathematical problems in college classes; express relationships in the symbolic language of mathematics; and appreciate the role of mathematics in analyzing natural phenomena.

Homework: Assigned periodically via www.webassign.net (*) and may include suggested questions, readings and other activities to supplement lecture. Due date, time and assignment description will be indicated on each assignment. Late assignments are *not* typically accepted.
The homework will take time and effort to work and may be difficult. Do yourself a favor, start the homework as soon as it is available, and allow plenty of time to work through each question. Be warned that some questions may go quickly and others may take a significant amount of time.
*NOTE: To get started, see http://webassign.net/manual/Student_Quick_Start_Guide_SE.pdf and use
-   Class Key: ** See top of page **
-   Name: Full name as on record with NMU (so I know who you are)
-   Email Address: Your official *@nmu.edu* email is required to be used for all university business
-   ID Number: MUST be your *complete* NMU IN with leading zeros. This is the *only* way to uniquely identify students; without it, you will NOT receive any credit for work completed via webassign. No exceptions.

Quizzes: May be administered during the regularly scheduled class time and may include content from lecture, homework, exams, labs or any other relevant course related information. Please note that quizzes may or may not be announced during lecture and will *never* be announced via email. **Make up quizzes will *not* be administered**. These will be designed with a few goals in mind (1) provide students the opportunity to check their understanding of relevant material and receive feedback from the instructor (2) provide the instructor with feedback as to how well students are understanding the material (3) encourage students to continue to stay on top of the material, develop sound study habits, regularly attend class, etc

Exams: There will be up to three (3) scheduled exams during the semester plus a final exam. Each in-class exam is equally weighted. If the final exam score is higher than the lowest in-class exam score, the final exam score will replace this lowest in-class exam score. Exams 1, 2 and 3 will be administered in the normal lecture room and during the normal meeting time. The final exam will be administered in the same room as lecture and at a time pre-determined by NMU. **Make up exams will not be administered**. If an exam is to be missed due to extenuating circumstances, contact me via email BEFORE the scheduled exam time to see about making the appropriate arrangements.
Use of notes, books or electronic gizmos of any sort will not be permitted on the exams unless otherwise specified by the instructor.

TENTATIVE Exam Schedule**:

Exam 1:	Normal class time	Mon	~13 Sep 2021	Ch 22 – 27 *[#'s for Serway 10ed]*
Exam 2:	Normal class time	Mon	~04 Oct 2021	Ch 28 – 33
Exam 3:	Normal class time	Mon	~25 Oct 2021	Ch 34 – 37
Final Exam	10:00 – 11:50AM	Mon	06 Dec 2021	All course material

**Exam *format*, *times* and *content* will be adjusted appropriately to accommodate the course schedule. Deviations from this tentative schedule will be discussed, *in class*, as they become relevant. Exam dates will typically be finalized a minimum of one week before the exam is administered.
The final exam time is predetermined by NMU and will *not* be modified by the instructor.
University Closure During Exam Week (as per the NMU Registrar):

"Students should be prepared for the possibility of in-class [final] exams being postponed and held later in the week than originally scheduled due to unforeseen circumstances, such as inclement weather, causing the University to close. If the University were to close one day during the first four days final exam week, that day's exams would be moved to Friday of exam week. Should the University close a second day or on the Friday of exam week, the exams scheduled for that day would be moved to Saturday afternoon of exam week. Exams scheduled to be taken on-line outside of the classroom will be administered on the originally scheduled date, regardless of changes to the in-class exam schedule due to unexpected University closures."

Grades:

Lab***, Quizzes, Homework, etc:	30%		A: ≥ 90%; B: ≥ 80%
Exams$^\lozenge$ (1, 2, 3, Final, Final; Best 4 of 5):	70%		C: ≥ 70%; D: ≥ 60%
Total:	100%		F: < 60%

'+' and '−' grades are typically assigned when a grade is within ± ~2.0% of the letter grade cutoff.
***Minimum grade of 60% in the laboratory component, in addition to appropriate performance in the rest of the course, is *required* to earn an overall passing grade in this course.
$^\lozenge$ If fewer than 3 exams are conducted in class or there is not a cumulative final exam, expect all exam scores to be counted with reduced weight assigned to the lowest scoring exam.

Lab:
Lab is a separate course in which you must be enrolled. A minimum score of 60% is *required* in order to qualify for a passing score in the lecture. To be clear, that means if your score is any less than 60.0%, you will have earned a FAILING grade in your lecture section. The final grade from the laboratory course part of your lecture score and likely to be weighted at ~15%. The laboratory section of this course is designed to provide hands on experience with the topics discussed in lecture.

Important Notes:
- **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 2001 C. B. Hedgcock Building (227-1737 or 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 Holidays**:
  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.
  Link to student handbook https://www.nmu.edu/policies?p=1070&type=Policy
- **Appropriate behavior**:
  I expect students to behave in a respectful, considerate and courteous fashion in any activity related to this course (e.g. Lecture, lab, discussion, office hours etc).
  Rude, disrespectful or disruptive behavior will *never* be tolerated.
- **Attendance**:
  o Attendance and participation in all scheduled classes is expected unless you are feeling unwell (note from healthcare provider may be required) or, in compliance with the university guidelines, have an official university-sponsored event that conflicts with class
  o **###**
  Official statement from NMU regarding attendance during the pandemic:
  "If you are experiencing COVID-19 symptoms, do not attend class, work, or campus and community activities. Please communicate with your instructors and/or work supervisors via email or phone to say you are not feeling well and will be absent. Stay home, avoid contact with others as much as possible, and contact your healthcare provider or the NMU Health Center for next steps, including COVID-19 testing.
  Instructors are not required to provide remote class sessions for absent students, but rather will work individually with students to provide options for making up missed class time and assignments. Students who have other issues due to being absent from class or work because of COVID-19 symptoms or infection, should consult with the Dean of Students Office. Human Resources can assist employees with leave options."
  ###
  o Changes to the in-person attendance policy may occur to comply with updates in university, local, state or federal guidelines.
  o *Any questions or concerns should be discussed with your professor as soon as possible*

Final Notes and Suggestions to Succeed:
- **Course Assistance**: A plethora of options are available to support your success in this course (e.g. Lecture [Dr. Mengyan], lab and discussion via class, office hours, email or special appointment), your textbook, the library, other text books and physics department tutors. Take advantage of the available resources. DO NOT HESTIATE TO ASK QUESTIONS AS THEY ARISE!
- Preparation is the key!
    o Read your book material before AND after we discuss it in class
    o Take good notes during lecture
    o Study your notes
    o Take advantage of available resources (e.g. *actually* attend class, read the book)
    o If something is unclear during lecture or your own studying, ASK ABOUT IT!
- Homework and supplemental work:
    o Work each question using the problem solving process. Getting the 'correct' numerical answer is *meaningless* if you do not understand the process used to arrive there.
    o Start your homework assignments as early as possible
    o Read the homework questions when they are available before the related material is presented in class; familiarity with the questions will help you associate the relevant concepts as they are introduced in lecture, lab and while you read the material
    o Give yourself plenty of time to complete the assignments as you will likely need to think carefully about the questions, review the relevant sections of the text or your notes and then work towards a solution
    o Use a dedicated notebook to *fully* work out homework and supplemental questions
- Studying for any exam should be an ongoing exercise. Structured reviews of material built into your schedule promotes better long-term retention and higher understanding of the material
- I cannot stress enough: ASK QUESTIONS WHEN YOU HAVE THEM!

TENTATIVE Schedule of Course Content:

Week	Start Date	Chapter[s]	Content / Additional Detail
1	23 Aug 21	22, 23	Electric fields; charge distributions
2	30 Aug 21	23, 24	Charge distributions, electric potential
3	06 Sep 21	25, 26, 27	Capacitance; current, resistance, circuits
4	13 Sep 21	27, 28, 29	Circuits; Magnetic fields; sources of magnetic fields; magnetism **Exam 1** (Ch 22-27: ~13 Sep 2021)
5	20 Sep 21	29, 30, [31,32]	Magnetism; Faraday's law; [Inductance; AC circuits]
6	27 Sep 21	30, 33	Faraday's law; EM Waves
7	04 Oct 21	33, 34, 35	EM Waves; light and ray optics; Image formation **Exam 2** (Ch 28 - 33: ~04 Oct 2021)
8	11 Oct 21	34,35,36	Light and ray optics; Image formation; wave optics
9	18 Oct 21	36, 37	Wave optics; diffraction and polarization
10	25 Oct 21	Special topics	**Exam 3** (Ch 34 – 37: ~25 Oct 2021)
11	01 Nov 21	Special topics	Selected topics
12	08 Nov 21	Special topics	(e.g. thermodynamics, fluid mechanics; oscillations
13	15 Nov 21	Special topics	and mechanical waves; modern physics)
14	22 Nov 21	** **No class** 21 – 28 Nov 2021: Thanksgiving break **	
15	29 Nov 21	Special topics	General review (question-based); student ratings
☺	06 Dec 21	**Final exam (10:00 AM Monday 06 Dec 2021)**	

Notable dates

23 Aug 2021	First official day of class
06 Sep 2021	Labor day (no class)
11 Oct 2021	Indigenous peoples day
07 Nov 2021	Daylight savings time ends ('fall' back)
11 Nov 2021	Veterans day
21 – 28 Nov 2021	Thanksgiving break (no classes)
05 Dec 2021	Last day of class
06 Dec 2021	Final exam 10:00 – 11:50 (in normal lecture room)