Introductory Physics 1 (PH 220) Lecture Syllabus

Winter 2020 ◦ 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 220:*"

Office Hours: Tu: 14−15:50 & R: 13:30−15:20 in *WS 2513*. Other times by appointment

Class Meetings: Lecture (CRN 10273): {M,T,R,F} 11:00 to 11:50 in *West Science 2902*

Webpage: https://www.webassign.net [class key: *nmu 9571 0358*]
Required for HW
Includes eBook
Self-enroll with class key. Instructions available at
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 (7^{th} 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 classical (Newtonian) mechanics, 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 220 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 220 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 legal 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 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	Fri	~07 Feb 2020	Ch 1 – 6 *[#'s for Serway 10ed]*
Exam 2:	Normal class time	Fri	~28 Feb 2020	Ch 7 – 9
Exam 3:	Normal class time	Mon	~30 Mar 2020	Ch 10 – 14
Final Exam	10:00 to 11:50	Tues	28 Apr 2020	All course material

[**]Exam *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.

Grades:

Lab***, Quizzes, Homework, etc:	30%	A: ≥ 90%; B: ≥ 80%
Exams (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.

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.

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!
  - Read your book material before AND after we discuss it in class
  - Take good notes during lecture
  - Study your notes
  - Take advantage of available resources (e.g. *actually* attend class, read the book)
  - If something is unclear during lecture or your own studying, ASK ABOUT IT!
- Homework and supplemental work:
  - 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.
  - Start your homework assignments as early as possible
  - 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
  - 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
  - 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	13 Jan 20	Intro, 1, 2, 3	Syllabus, expectations Scientific method, problem solving process, general intro to physics, physical quantities, measurement, coordinate systems, 1-D kinematics
2	20 Jan 20	3,4	2-D Kinematics (projectile, uniform circular motion, tangential & radial acceleration)
3	27 Jan 20	4,5	Laws of motion/Forces/FBD's
4	03 Feb 20	4,5,6, 13	Laws of motion/Forces/FBD's; friction; uniform circular motion, gravitation **Exam 1** (Ch 1-6: ~07 Feb 2020)
5	10 Feb 20	7,8	Work, energy, conservation of energy, power
6	17 Feb 20	8,9	Linear momentum, collisions, Center of mass
7	24 Feb 20	8,9,10	Collisions, rotational motion, Newton's 2nd law, moment of inertia, torque **Exam 2** (Ch 7-9: ~28 Feb 2020)
-	*02 Mar 20*	*%% Mid-semester recess, no class 02 to 06 Mar 2020 %%*	
8	09 Mar 20	10, 11	Newton's 2nd law, moment of inertia, torque, energy, momentum
9	16 Mar 20	12	Torque, equilibrium, elasticity
10	23 Mar 20	14	Fluid statics and dynamics
11	30 Mar 20	18 – 21	**Exam 3** (Ch 10-14: ~30 Mar 2020) Temperature, thermodynamics, heat engines, entropy
12	06 Apr 20	18 – 21; 15 – 17	Thermodynamics; oscillations and standing waves
13	13 Apr 20	Special topics from 14+	Selected topics from later in the book
14	20 Apr 20	Special topics from 14+	Selected topics from later in the book; General review
☺	**28 Apr 20**	**Final exam 10:00 to 11:50 (WS 2902)**	

Notable dates

13 Jan 2020	First official day of class
20 Jan 2020	Martin Luther King Day (no class)
02 to 06 Mar 2020	Mid-semester recess (no class)
08 Mar 2020	Daylight savings time starts ('spring' forward)
25 Apr 2020	Last day of class
Thurs 30 Apr 2020	Final exam (10:00 to 11:50)
Sat 02 May 2020	Commencement