

PHY 141 Introductory Physics I – Mechanics and Thermodynamics

Syllabus

Instructor: **Dr. Sheng-Chiang (John) Lee**

SEB 206, 478-301-2599

Office Hours: MW 2~3:30pm, F 2~3pm, or by appointment

Lecture (SEB 110): MWF 11:00~11:50am

Labs (SEB 219): **TR 12:15~2:55pm**

Pre-requisite: MAT 133 or equivalent

Textbook: *Physics, 4th edition, James S. Walker*

Course Description:

This course is the first of a 2-semester algebra-based introductory physics sequence. This course introduces students to the field of physics and its applications in other disciplines, especially in life sciences. Although most physical principles can/will be demonstrated and emphasized in the class conceptually, they are all formulated through mathematical expressions. Therefore, to be successful, students are expected to have fluent mathematical skills in algebraic manipulations, trigonometry, and power/logarithmic functions.

The topics covered in this class include:

Force, torque and equilibrium; Newton's laws of motion, momentum, work, and energy; fluid dynamics; thermal physics.

Objectives:

After taking this course, you are expected to be able to

- Explain basic physical principles discussed in the course;
- Identify basic physical principles in simple physical systems and predict their behaviors.
- Apply scientific logic to solving physical problems analytically and quantitatively.

Grading Methods:

Grading Scale:

Score:	90+	85~89	80~84	75~79	70~74	60~69	59-
Grade:	A	B+	B	C+	C	D	F

Grading Components:

	Laboratory (20%)				Lecture (80%)			
	Pre-Lab Quiz	Participation	Mid Report	Final Report	In-Class Quizzes	On-line Homework	Exams (x 4)	iClicker Quizzes
Weight:	1%	4%	6%	9%	12%	10%	(14+14+14+14) = 56%	1 + 1 = 2%

Lecture Grades

In-Class Quizzes are working problems taken from the assigned readings or homework problems. All quizzes will be announced in the previous class, and **NO** make-up quizzes are available for unexcused absence or late for a class.

On-line Homework will be submitted and graded through the on-line homework/tutor system, *WebAssign*[®]. You may find more information below. Due date of each assignment will be announced in the class. No late submission will be accepted unless you have really compelling and legitimate reasons.

Exams are inevitably **accumulative**, since physics is an accumulative knowledge. You cannot master more advanced topics without being fluent with the basics. However, exams will concentrate

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on the content covered in the corresponding periods, unless otherwise specified. All exams will be close-book. **A formula sheet will be provided**, and you should only bring your pen/pencil, calculator, blank paper for calculation, and your knowledge of physics to the exams. **No** make-up exam is available unless you are legitimately excused PRIOR to the exam.

Your grades will be posted on BlackBoard immediately after your work is graded. If there is any concern about your grades, you should discuss with me within **ONE** week after they are posted.

iClickers are used to enforce pre-lecture preparation on the students' part and to facilitate in-class discussions through polling class responses to some conceptual questions. Before starting a new chapter, a few simple questions from your assigned reading will be given in class through iClicker®. These questions are graded based on your accuracy and count for 1% of your grade.

Through out the course, quizzes on various concepts will also be administered through iClicker® in class whenever it is appropriate to facilitate discussions. These quizzes are graded based on your participation and count for another 1% of your grade.

Each student must have a unique iClicker® to use in the class throughout the semester (the same type used in many chemistry and biology courses at Mercer). You should be able to purchase them from the bookstore. There will be no make-up for missed iClicker® activities/grades. Missed grades may be waived only if you have excused absence or legitimate reasons permitted by the instructor.

Laboratory Grades

There will be six topics of lab activities. One is about vectors, and others are related to physical concepts learned in class. Each topic is worth 20 points and usually includes the following components. Variations from this description will be announced in advance.

Participation (4 points) is mostly measured by how you participate during the lab periods. 0.5 point will be deducted for each unexcused tardy (so for a two-week topic, you can lose up to 1 point for tardiness). If you are on your cellphone without permission during the lab period, you will be warned for the first time without penalty and 0.5 point will be deducted for each following warning. If you are a bystander and not engaging in the lab activities, the instructor may further deduct points as deemed appropriate.

Pre-Lab Quizzes (1 point) You should be prepared whenever you come to a laboratory. Though there is no formal lab manual for you, you will be provided with a list of equipment (and how they work) and the general topic of the experiment in advance. You should read it before you come to the lab. A simple quiz will be given at the beginning of each set of lab activities to enforce this exercise.

Mid-lab and Final Lab Reports (15 points) The activities of each topic usually take two weeks. At the end of the first week(s) of each topic, you will be asked to submit a short mid-lab report to summarize what you do in that week and your plan for the next week. The mid-lab report is worth 6 points, or 3 points/each if there are two mid-lab reports for a three-week topic.

In the last week of each topic, if time allows, you will be asked to finish the final report (9 points) during the lab period. The hard deadline is one week after completion of the lab activities. Late reports will only be accepted within the first week after they are due and 2 points will be deducted from the grade. Each report should be **typed up using the provided report template**. The reports should follow the typical format: **double-spaced between lines; font-size = 12; 1 inch margin**. The mid-lab and final reports are graded as following.

Mid-Lab Report (6 points):

- 2 points – completion of the worksheet, including data, analysis and answers
- 2 points – thoughtfulness of the answers to the worksheet questions
- 2 points – correctness of the answers to the worksheet questions

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Final Report (9 points):

- 1 point – Following the provided report format and using proper grammar/spelling
- 1 point – Including all required components (all four sections) in the report
- 1 point – Expressing the lab objective(s) and physical principles correctly
- 2 points – Including complete data set and completed data/error analysis
- 2 points – Correctness of analysis and scientific reasoning in analysis discussion
- 2 points – Thoughtfulness in reflection and conclusion

Class Evaluations

In an ongoing effort to improve the quality of instruction, each student enrolled in this course is required to complete the CLA standard survey on student perception of the course at the end of the semester. To supplement the CLA survey, each student is also asked to complete two other surveys that allow free written responses for more elaborative feedback. All evaluations are administered through **BlackBoard** during the last week of the semester. Students should submit complete these evaluations preferably by 4/26 and no later than 4/29.

More Information about *WebAssign*[®]

Each student in the course must obtain an online account with *WebAssign* for this textbook. The cost is \$29.95. This access allows you to complete online homework assignments.

You will receive the “Class Key” on the first day of the class. You will use this key to enroll your *WebAssign*[®] account in this class (through [WebAssign[®] self-enrollment site](#)). You only need to do this once at the beginning of the semester. After then, you only need to log in through the [WebAssign[®] login](#) site to access the on-line homework system. You will submit all homework assignments through *WebAssign*[®], and they will be graded for 10% of your semester grade.

Important Dates:

Last Day for Course Withdrawal: 3/23/2017!!!!

Final Exam: 5/04, Thursday, 9am ~ 12pm

Class Policies:

Attendance Policy: Attendance is not mandatory for lectures. However, students are solely responsible for the missed grades due to absence and learning the materials covered in the missed classes, including announcements. Attendance and active participation in labs are mandatory.

Class Etiquette: You are expected to conduct yourself in a respectful manner to your fellow classmates and the instructor. The instructor may ask you to leave the classroom/lab if your behavior is disturbing to the instructor or other students.

Honor Code: You are bound by the Mercer honor code. The College’s academic misconduct policy will be followed. All work, for which a grade is received, must be the **original** work of the **student** without aid or assistance of another party, or any printed and or electronic data/information. Academic misconduct cases will be referred to the honor council and the student will automatically receive a grade of incomplete (IC) pending a ruling by the honor council.

Cell Phone and Laptop Usage: Out of courtesy for all those participating in the learning experience, all cell phones must be **kept in your pocket/backpack with power/ringer off** before entering any classroom, lab, or formal academic or performance event.

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Laptops may be used in class to assist individual's learning (e.g. to access on-line supplemental materials, to view provided class presentation and take note, etc.). However, using laptops for activities unrelated to the class is prohibited.

Warning will be given for the first-time violation. One semester credit will be taken for each following violation up to three times. If a student keeps violating the policy, one may be asked to leave the room by the instructor.

No cell phones/laptops are allowed during exam times.

Documented Disability Statement: *"Students requiring accommodations for a disability should inform the instructor at the close of the first class meeting or as soon as possible. The instructor will refer you to the ACCESS and Accommodation Office to document your disability, determine eligibility for accommodations under the ADAAA/Section 504 and to request a Faculty Accommodation Form. Disability accommodations or status will not be indicated on academic transcripts. In order to receive accommodations in a class, students with sensory, learning, psychological, physical or medical disabilities must provide their instructor with a Faculty Accommodation Form to sign. Students must return the signed form to the ACCESS Coordinator. A new form must be requested each semester. Students with a history of a disability, perceived as having a disability or with a current disability who do not wish to use academic accommodations are also strongly encouraged to register with the ACCESS and Accommodation Office and request a Faculty Accommodation Form each semester. For further information, please contact Carole Burrowbridge, Director and ADA/504 Coordinator, at 301-2778 or visit the ACCESS and Accommodation Office website at <http://www.mercer.edu/disabilityservices>.*

General Education Course: The College of Liberal Arts is keenly interested in assuring the quality and integrity of its General Education Program. Every semester, randomly-selected students from each General Education course will be required to submit samples of their work to an independent and objective assessment by faculty. No personally identifiable information about any student will be used for the purposes of this assessment, and assessment results will have no bearing whatsoever on student grades

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Tentative Course/Lab Schedule: may vary according to actual progress

Week	Topic	Required Reading
1/09 – 1/13 (3)	Basic Tool Kits & Vectors	Ch1; Ch3.1 ~ 3.3
1/16 – 1/20 (2)	MLK Day Newton's 1 st Law; Static Equilibrium	Ch4.1; Ch9
1/23 – 1/27 (3)	More on Static Equilibrium; Translational Motions	Ch2
1/30 – 2/03 (3)	Newton's Laws on Force and Motion	Ch4.2 ~ 4.4; Ch5
2/06 – 2/10 (3)	More on Forces/Motions Review & Exam	Ch6.1 ~ 6.3
2/13 – 2/17 (3)	Work & Energy	Ch7
2/20 – 2/24 (3)	Work & Energy continued (include Power)	Ch7
2/27 – 3/03 (3)	Potential Energy and Linear Momentum	Ch8.1 ~ 8.5; Ch9
3/06 – 3/10 (0)	Spring Break	
3/13 – 3/17 (3)	Conservation Laws; Review & Exam	Ch8.1 ~ 8.5; Ch9
3/20 – 3/24 (3)	Fundamental of Static Fluid	Ch11
3/27 – 3/31 (3)	Fluid Dynamics	Ch12.1 ~ 12.4
4/03 – 4/07 (2)	Review & Exam; Bear Day	
4/10 – 4/14 (2)	Temperature; Good Friday	Ch13.1 ~ 13.3
4/17 – 4/21 (3)	Heat	Ch14
4/24 – 4/28 (3)	Thermodynamics	Ch15.1 ~ 15.3
5/04	Final Exam (9~12pm)	

Week #	Date	Lab #	Title
1	1/09 – 1/13	1	Introduction to Lab Getting to know vectors and applications in force balance
2	1/16 – 1/20		MLK Day – no labs
3	1/23 – 1/27	2	Force and Torque Balance
4	1/30 – 2/03		
5	2/06 – 2/10	3	Motion and Newton's Law
6	2/13 – 2/17		
7	2/20 – 2/24		
8	2/27 – 3/03	4	Conservation Laws
9	3/06 – 3/10		Spring Break – no labs
10	3/13 – 3/17	4	Conservation Laws
11	3/20 – 3/24		
12	3/27 – 3/31	5	Fluid Dynamics
13	4/03 – 4/07		Bear Day
14	4/10 – 4/14	5	Fluid Dynamics
15	4/17 – 4/21	6	Thermal Physics
16	4/24 – 4/28		