SYLLABUS

COURSE DESCRIPTION

Introductory Physics I - PHYS121 is the first semester of calculus-based introductory physics course. The focus is on mechanics.

LEARNING GOALS

This course addresses the General education program (GEP)'s functional competency Scientific and Quantitative Reasoning. It has been approved to meet the GEP Sciences distribution requirement. In particular, it addresses the following two competencies:

- Understand and use mathematical and scientific methods of inquiry, reasoning, processes, and strategies to investigate and solve problems.
- Organize, interpret, draw inferences, and make predictions about natural or behavioral phenomena using mathematical and scientific models and theories.

By the end of this semester, students should be able to demonstrate the following abilities:

- Solve 1-dimension and 2-dimension kinematics motion problems
- Apply Newton's laws to solve problems related to motion and force
- Apply energy principle to solve mechanics problems
- Apply conservation of momentum to solve problems related to collision
- Apply Newton's 2nd law for rotation to solve rotational dynamics problems
- Solve problems related to static equilibrium
- Apply conservation of angular momentum to solve problems
- Apply Newton's laws and energy principle to solve problems related to simple harmonic motion

PREREQUISITE

You must have passed MATH 151 or at least be enrolled in it this semester.
Basic college algebra is used extensively in this course, and the use of calculus will be phased into the course on pace with the MATH151 class.

CLASS MEETING

Lecture: MonTueThu 9:30-11:45, Physics 201
Discussion: MonTue1:00-2:50, Physics 226

INSTRUCTOR & TA

Instructor: Dr. Lili Cui lili@umbc.edu

- Office hour: before/after class or by appointment
- Physics related questions should be posted on the *Blackboard Discussion Board* instead of personal email so everyone in class can benefit from the discussion.
- Email is a great method for non-physics questions. Please include your full name, course number, and use your UMBC email address to ensure prompt response.

TA: Jacob Romanski jromans1@umbc.edu
Office hour: MonTue 12-1, Physics 226

Grader: Mary Keenan mkeenan1@umbc.edu

REQUIRED TEXTBOOK & OTHER MATERIAL

- *Physics for Scientists and Engineers*, by Tipler and Mosca, 6th ed., Volume 1
- *FlipIt Physics* (electronic pre-lecture and homework assignments)
- *Clicker* Turning Technologies RFC-03 (can be purchased from UMBC bookstore)
- *Calculator*
- *A clear and focused mind, good attitude…*

SUCCESS STRATEGY

- Be sure you have the time required for the course. You are expected to attend all classes – lectures and discussions. In addition, experience shows that success requires at least 12 hours of intensive effort outside of class each week for this intensive summer course. If you typically spend much less than 12 hours of outside study, you are unlikely to be able to learn the material. If you typically spend much more than 20 hours of outside study, you should consult with the instructor about ways to study more efficiently.
- Physics is about understanding, not memorization. Instead of only paying attention to results, it is more important to understand how you get results.
- You have many resources including the textbook, study group, your friends, teaching assistants, me, YouTube and more. Use them wisely.
- It is essential to develop an ability to think and learn for yourself. You must be actively engaged to learn the material, you cannot passively watch me or your classmates and expect to understand the concepts and develop problem solving skills. Cognitive science has proven that the mind must interact to learn.

Success in the course is not "a piece of cake", but can be achieved with effort and the right study strategies.

GRADING POLICY

Type of Assignment	Percentage
Prelecture and checkpoint	5%
Class participation (clicker)	5%
Homework	10%
Discussion	10%
Quiz	15%
Exam (2 @ 15% each)	30%
Final Exam	25%
Total	100%

I do *not* grade on a curve. Why should I assume that x% of you will be failing this course? If you all do an excellent job, you all deserve an A. How well your neighbor is doing should not affect your grade. Help each other and learn from each other.

90.0% or Above	A
80.0% - 89.9%	B
70.0% - 79.9%	C
60.0% - 69.9%	D
59.9% or Below	F

I do not drop any assigned work or exams, nor do I have any extra-credit material. There is no unexcused clicker absence or clicker malfunction for the course.
Check your grades on Blackboard routinely. Please contact me or your TA for any grading questions within one day after grade is available.

PRE-LECTURE

- You are expected to read the related textbook sections and complete pre-lecture assignment via FlipItPhysics prior to every lecture; it makes for much more efficient learning. The class time will be spent on clarifying and applying the material.
- As a general rule, FlipItPhysics Prelecture and Checkpoint assignments will be due on Mondays, Tuesdays, and Thursdays at 9:00 AM, though the due dates may be adjusted on occasions.

LECTURES

- Clickers will be used to track attendance and promote active learning by providing instant feedbacks for both the instructor and students. If your clicker does not work or if you forget your clicker, you will not receive attendance credit.
- The lecture PowerPoint slides will be posted on Blackboard.
- Most lectures will begin with a written quiz that's based on the materials from the previous lecture, homework, and discussion.
- If you miss one lecture, you are responsible for finding out what was done.

DISCUSSION

- The discussion classes are a required part of the course.
- Each discussion grade will be divided equally between your attendance and submitted work.
- Full attendance is required for every discussion. Discussion is based on group work, it's designed to provide you with a collaborative learning environment so you can help and learn from each other. To ensure the integrity of group work and the fairness to each group member, full attendance is mandatory and there will be a penalty for arriving late or leaving early. 20% will be removed from the discussion score for every five minutes that a student is tardy in coming to the discussion. In addition, those arriving late to class will not be allowed to benefit from the work of students who arrive on time. If you are ten minutes late, you will be automatically removed from your original group. You might need to work on your own or join another group.
- Your discussion instructor will give specific guidelines.

HOMEWORK

- A major part of what I expect you to learn in this class will come as a result of doing homework. You need to fully *understand* how to solve the assigned homework problems to do well on the exams and to succeed in this course.
- Individual homework will be submitted via the FlipItPhysics online system. As a general rule, assignments will be due at midnight prior to the next lecture, though the due dates may be adjusted on occasions. You are normally allowed six submissions per question part.
- Homework questions are not easy and you will find yourself spend a lot of time on them. This is expected. *Don't put off assignments until the night before they are due.* Instead start your homework early enough so you have time to get help.
- Since the main purpose of homework is to prepare you for the exams, keep a careful written record of your work for future studying. Written homework might be collected and graded.
- There are websites where you can view (or perhaps purchase) solutions to homework problems. I cannot stop you from cheating, but I strongly recommend you don't. *Consider your goals...are you trying to just get the homework done or do you actually want to learn something?* I guarantee that the more you use solutions written by someone else, the less likely you will be able to produce your own solutions on quizzes and exams.

EXAM

- You have to do well on all exams to be able to get a good grade for the course. The prelecture, lecture, discussion activities, and homework will help you acquire the understanding and problem solving skills you'll need.
- There will be two mid-term exams, see the schedule for the exact dates.

FINAL EXAM

The final exam will be comprehensive. There is no make-up exam for the final and no one will be allowed to take the final at a different time.

MAKE UP POLICY

Life is full with surprises so it's understandable that you might miss a class or two. The course policy has been set up to accommodate a few unexpected situations.

- Lecture: You will be given two "free" days for not clicking in lecture. These count towards ALL absences and clicker malfunctions.
- Online FlipItPhysics prelecture, checkpoints and homework: You can request an automatic extension any time up to 2 days after the assignment is due with a 50% penalty of all unearned points.
- Discussion: There is no make-up discussion. If you must miss a discussion due to officially-sanctioned UMBC activities, illness, family emergency, detention by authorities, or another insurmountable difficulty, contact your TA as soon as possible to make alternative arrangement.
- Exam: If you must miss an exam due to officially-sanctioned UMBC activities, illness, family emergency, detention by authorities, or another insurmountable difficulty, contact me as soon as possible. At my discretion, I'll request written verification of the cause of your absence.

TUTORIAL CENTER

The Learning Resource Center supplies free tutors for this and many other 100- and 200-level courses. Please contact at (410) 455-2444 or visit http://www.umbc.edu/lrc/ for more information.

ACADEMIC INTEGRITY

"By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal." To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook.

DISABILITIES

- If you have any condition such as a physical learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me in the first week of the course.
- If you are taking the exam with the Student Support Services, inform me by email with the detailed information at least 48 hours before every exam.

COURSE WEBSITE

I will put most of my teaching materials in our course site through Blackboard. After log in myUMBC, click on the "Blackboard" tab and then click on "PHYS 121 – SU 2016" in the "My Courses" area. You are responsible for all content delivered via Blackboard. You will use the website for:

- Checking the *Announcements*.
- Accessing *Syllabus* and *Course Documents*
- Checking the *Grades* that you have earned.
- Interacting with the instructor and others online using *Discussion Board*.

SCHEDULE

Week	Date	Topics	Book Reading[1]
1	May 31 (T)	Introduction and 1-D Kinematics	Chapters 1 & 2
	June 2 (H)	Quiz 1 & 2-D Kinematics	Chapter 3
2	June 6 (M)	Quiz 2 & Newton's laws	Chapter 4
	June 7 (T)	Quiz 3 & Applications of Newton's laws	Chapter 5
	June 9 (H)	**Exam 1** & Work and Energy	Chapter 6
3	June 13 (M)	Quiz 4 & Conservation of Energy	Chapter 7
	June 14 (T)	Quiz 5 & Linear Momentum	Chapter 8:1-2
	June 16 (H)	Quiz 6 & Collision	Chapter 8:3
4	June 20 (M)	Quiz 7 & Rotational Kinematics	Chapter 9:1-3
	June 21 (T)	Quiz 8 & Rotational Dynamics	Chapter 9:4-6
	June 23 (H)	**Exam 2** & Statics	Chapter 12
5	June 27 (M)	Quiz 9 & More on Statics	Chapter 12
	June 28 (T)	Quiz 10 & Angular Momentum	Chapter 10
	June 30 (H)	Quiz 11 & Simple Harmonic Motion	Chapter 14
6	July 4 (M)	Holiday (Independence Day)	
	July 5 (T)	Quiz 12 & Fluid Statics	Chapter 13
	July 7 (H)	**Final Exam**	

[1] Readings are to be done before coming to class.