

# Physics 111 Introductory Physics

Mr. Garrett Hickman

Physics Room 413

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Mr. Breiding (lab instructor, Mon-Wed 3:30-5:30 section)

Mr. Nimer (lab instructor, Tue-Thu 10:30-12:30 section)

Mr. Scott (lab instructor, Mon-Wed 6:00-8:00 section)

Mr. Brewster (lab instructor, Mon-Wed 10:30-12:30 section)

<b>Class Meeting:</b>	Lecture: Monday – Wednesday – Thursday 1:00-3:15	Physics 101- LH6
	Lab: Mon-Wed 10:30-12:30 or 3:30-5:30 or 6:00-8:00	Physics 108
	Tue-Thu 10:30-12:30	Physics 108

**Course Overview:** This course is the introductory, algebra-based physics course. In general, this is the intro physics course for life-science majors or for general education credit. The list of topics covered in this class include: motion and forces, momentum, energy and work, and thermal and fluidic properties of matter. The goals of this course are (1) that you can demonstrate an understanding of the topics listed above, (2) that you are able to acquire, analyze, interpret, and model experimental data, (3) that you can apply scientific reasoning and mathematical techniques that you practice in the homework, (4) that you can communicate your reasoning processes clearly. I expect you to be able to work with these ideas and apply them to situations by the end of the session.

We will cover most of the first three section of the textbook (through Chapter 13) in this course, and a general schedule of the topics covered and the exam dates can be found at the end of this document. Please do not schedule something else for the exam dates. The class time for this summer course matches the amount of class time for our normal semester, and so we cover exactly the same material at the same depth. I expect the same level of knowledge as in a normal semester.

Since this class is relatively small, it will be a relaxed lecture setting. In other words, although it will be a lecture course, there is the opportunity for you to ask questions during the lecture, and for me to ask questions of you. There will be in-class quizzes each day, performed through the electronic response system (clickers). Besides receiving a grade for these, they will be the basis for part of your electronic homework.

**Pre-requisite:** High school mathematics, including college algebra and trigonometry

**Textbook:** College Physics a Strategic Approach 2<sup>nd</sup> Edition by Knight, Jones, and Field (required)  
Mastering Physics: Electronic Homework for College Physics (required)  
Turning Technologies Clickers (required)  
These are available at the university bookstore; and the textbook and clickers are available used.  
Laboratory Experiments are available through Blackboard Website

## Grading:

Daily “clicker” quizzes	5%
Two in-class exams	20% each
Final exam (last day of class)	20%
Mastering Physics homework	15%
Paper-based homework	10%
Lab	10%

A: 90-100	B: 80-90	C: 70-80	D: 60-70	F: 0-60
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**Homework:** This is one of the most important aspects of this class. Although you will learn a lot from my enlightening lectures and from reading the textbook, the only way to learn this material is by working through the important material and applying it to problems. The homework will at times be challenging; remember that it is the only time I can ensure that you examine a complicated problem. There is not enough time for this on exams.

This course is very compressed in time, and so homework will be due at each class meeting. Most of this homework is through the Mastering Physics website, that is, electronic homework. **Please make sure that you purchase the correct version of Mastering Physics, the version for the College Physics by Knight, 2<sup>nd</sup> edition.** If you purchase an incorrect version (for the wrong textbook or wrong edition), you will not be able to access the assigned electronic homework. The homework assignments have particular due dates/times and you cannot submit these after this time. When you do the Mastering Physics homework, you should work it out with paper and pencil and keep this for future studying. There will be several versions of the electronic homework and so do not get nervous if your homework does not match your friends' homework.

To access Mastering Physics you should go to: <http://www.masteringphysics.com> and click Register – Students. You will then need to enter your access code (from inside the Mastering Physics package that you have purchased at the bookstore, or from a purchase at this point). The course id that you will need to enter is **MPHICKMAN53507**.

There will be written homework due at the beginning of most classes. Please write neatly, staple the pages together, please begin each problem on a new page, and make sure that your name is on the first page. If it is illegible or does not have a logical flow, I will not grade it.

I imagine that you will get together on a regular basis in small groups. This is a good tool if used properly and a disaster if used incorrectly. Once you have done your own studying and worked out the problems, it is good to discuss the ideas with others. Please do not use it without working on the problems on your own.

**Lab Component:** This course has a separate lab component that will count for 10% of your final grade for the course. There are four lab sections, three of them meet on Monday and Wednesday and the fourth meets on Tuesday and Thursday; and you registered for one of these sections. You must go to the section in which you registered, as they are taught by different instructors. There is pre-lab homework that is due before the lab, which ensures you are prepared for the lab. In addition, there is homework on each lab due at the start of the next lab. Your lab homework will only be accepted if you completed the related lab. Your grade for each lab is based on the pre-lab, full attendance and participation in the lab session, and the lab homework. There are ten labs over the six-week session.

**Office Hours:** I will be available in my office (Physics building room 413) on Monday, Wednesday, and Thursday after each lecture (from 3:15-4:15) and on Tuesday and Friday from 11:00-12:00. You may also make an appointment to meet at another time by contacting me through email.

**Academic Integrity:** I am obligated to ensure that students know the repercussions of cheating. If you are found cheating, you will receive a zero for that work. Depending on the severity of the incident there may be further penalties as well. The University has a website that addresses the concept of academic integrity: [http://www.umbc.edu/undergrad\\_ed/ai/](http://www.umbc.edu/undergrad_ed/ai/).

## Schedule:

	Hour 1	Hour 2	Hour 1	Hour 2	Lab
<b>May 27</b>	Concepts of motion	1-D Motion	Sections 1.1-1.6	Sections 2.1-2.4	Lab 1: Intro to Motion
<b>May 28</b>	1-D Motion	1-D Motion	Sections 2.4-2.6	Section 2.7	
<b>Jun 1</b>	2-D Motion	2-D Motion	Sections 3.1-3.3	Sections 3.4-3.7	Lab 2: Changing Motion
<b>Jun 3</b>	Forces	Newton's Laws	Sections 4.1-4.5	Sections 4.6-4.8	Lab 3: Mathematical Models
<b>Jun 4</b>	<b>Exam 1</b>	N-Law Applications	<b>Chapters 1-3</b>	Sections 5.1-5.4	
<b>Jun 8</b>	Friction and Drag	N-Law Applications	Sections 5.5-5.6	Sections 5.7-5.8	Lab 4: Force and Motion
<b>Jun 10</b>	Circular Motion	Orbits	Sections 3.8 & 6.1-6.3	Sections 6.4-6.7	Lab 5: Force, Mass, Acceleration
<b>Jun 11</b>	Stable Equilibrium	Springs and Elasticity	Sections 8.1-8.2	Sections 8.3-8.4	
<b>Jun 15</b>	Momentum and Energy	Impulse and Collisions	Sections 9.1-9.2 & 10.1	Sections 9.1-9.6	Lab 6: Torque and Equilibrium
<b>Jun 17</b>	<b>Exam 2</b>	Energy and Work	<b>Chapters 4-8</b>	Sections 10.1-10.3	Lab 7: Elasticity
<b>Jun 18</b>	Potential & Thermal Energy	Conservation of Energy	Sections 10.4-10.5	Sections 10.6-10.8	
<b>Jun 22</b>	Using Energy	Temperature and Heat	Sections 11.1-11.3	Section 11.4-11.5	Lab 8: Conservation of Energy
<b>Jun 24</b>	Engines and Refrigerators	Atomic Model	Section 11.6-11.7	Sections 12.1-12.2	Lab 9: Oscillations
<b>Jun 25</b>	Ideal Gas	Thermal Properties	Sections 12.2-12.4	Sections 12.5-12.8	
<b>Jun 29</b>	Heat Engines & Refrigerators	Fluids and Pressure	Section 12.7	Sections 13.1-13.2	Lab 10: Chemical Energy
<b>Jul 1</b>	Pressure and Buoyancy	Buoyancy and Dynamics	Sections 13.3-13.4	Sections 13.5-13.6	---
<b>Jul 2</b>	<b>Final</b>	<b>Exam</b>	<b>Chapters 1-13</b>		---