Physics 121 Introductory Physics (preliminary)

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Room 226

Class Meeting: Lecture: Monday – Tuesday – Thursday 9:30-11:45 Physics 201
Discussion: Tuesday – Thursday 1:00-2:50 UC 115D

Course Overview: This course is the introductory, calculus-based physics course. In general, this is the intro physics course physical science and engineering majors, not for life-sciences. The list of topics covered in this class include: motion and forces, momentum, energy and work, and thermal 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 analyze, interpret, and model physical situations using the principles found in the above topics, and (3) 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 the first section of the textbook (through Chapter 13) in this course. I will be posting a general schedule by the first class. There will be 3 in-class exams and a final exam. The dates for the in-class exams are: July 17, July 28 and August 7, and the date for the final exam is August 14, during the discussion class meeting time (1:00-2:50). Please do not schedule anything else for the exam dates as there are no make-up exams for this course. 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 electronic homework due each class day, through the Web Assign system, as well as some written homework due at the beginning of classes.

The discussion class for this course is a required part of the course. Besides dealing with some of the concepts and practical matters of analyzing problems, the discussion class will be using VPython to do computer modeling of the physical situations. No prior computer programming experience is necessary for this course. The software needed is available on-line for free, and is present on the UMBC computers.

Pre-requisite: MATH151 is a co-requisite. This means that I expect that everyone in the class has had MATH151 or an equivalent calculus course.

Textbook: Matter & Interactions 3rd Edition by Chabay and Sherwood (required)
Web Assign for Matter & Interactions (required)

Grading:

Three in-class exams	15% each
Final exam (last day of class)	20%
Mastering Physics homework	15%
Paper-based homework	10%
Discussion class	10%

A: 90-100 B: 80-90 C: 70-80 D: 60-70 F: 0-60

Homework: This is one of the most important aspects of this class for learning the material. Although you will learn a lot from my enlightening lectures and from reading the textbook, the only way to learn this material to the level that is expected is by personally 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 during the summer session, and so homework will be due before each class meeting. Most of this homework is electronic homework through the Web Assign website. Thus, you need to make sure that you have access to the internet via a computer. These are available in the library and in the computer labs across campus.

To **access Web Assign**, the web site for the electronics homework, you should go to:
http://www.webassign.net/ and click Have a Class Key?
You will then need to enter our class code: **umbc 8162 5749**
Help with getting started with Web Assign is at:
http://www.webassign.net/manual/WA_Student_Quick_Start.pdf

There is written homework that is 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 accept 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.

Office Hours: I will be available in my office on Monday, Tuesday, and Thursday after each lecture (from 12:00-1:00). You may also make an appointment to meet at another time by contacting me through email.

Academic Integrity: I feel obligated to ensure that students know the repercussions of cheating. If you are found cheating, you will receive a zero for that work, and you will be reported to the Academic Conduct Committee. The University has a website that addresses the concepts of academic integrity:
http://www.umbc.edu/undergrad_ed/ai/

Physics 121 **Preliminary Schedule** **Summer 2014 Session 2**

Week	Date	Lecture (9:30-11:50)	Text	Discussion (1:00-2:50)
Week 0	**T Jul 1**	Syllabus Lecture Notes 0		VPython Files & Description
Week 1	**M Jul 7**	Intro & Vectors 1.100 Motion	1.5 1.1-1.9	
	Tu Jul 8	Force, Impulse, Momentum Computer Modeling Motion	2.1-2.4 2.5, 2.7	VPython 3-D Vectors
	Th Jul10	Gravitational, Electrical, and Spring Forces	2.5, 3.1-3.6	Modeling Motion
Week 2	**M Jul 14**	Analytic Solutions for Constant Force, Free-Fall & Projectile Motion	2.6	
	Tu Jul 15	Tensions and Springs Stress, Strain & Young's Modulus	4.1-4.5 4.6	Analytic Solutions
	Th Jul 17	**Exam 1** Friction	4.7-4.8	Modeling Orbits
Week 3	**M Jul 21**	Statics and Circular Motion	5.1-5.7	
	Tu Jul 22	Work and Energy Gravitational Potential Energy	6.1-6.3 6.6-6.8, 7.3	Analytic Orbits
	Th Jul 24	Energy Graphs Electrical Potential Energy	6.14	Analytic Spring Motion
Week 4	**M Jul 28**	**Exam 2** Spring Potential Energy	7.1	
	Tu Jul 29	Internal Energy of Solids Thermal Energy & Heat	7.2-7.3 7.4-7.5	Many Particle Modeling
	Th Jul 31	Heat, Work & Conservation of Energy	7.5	XXXXXXXXXXX
Week 5	**M Aug 4**	Energy Quantization & Spectra	8	
	Tu Aug 5	Multi-particle Systems Rotational Motion	9	Problem Solving
	Th Aug 7	**Exam 3** 1-D Collisions	10.1-10.5	XXXXXXXXXXX
Week 6	**M Aug 11**	2-D Collisions Angular Momentum	10.6-10.11 11	
	Tu Aug 12	Angular Momentum	11	Review
	Th Aug 14	Entropy Heat Engines	12 13	**Final Exam**