PHYS 121 **Introductory Physics I** *Summer 2014*
4 Credits 9:30 – 11:45 am

Instructor
Dr. Shay Strong (JHU Senior Scientist, UMBC Lecturer)
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TA Contact Information
Brendan Hurst
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Description & Goals
The course emphasizes rigorous problem solving in physics using interactive instruction, cooperative learning, educational software, & computer applications important for science and engineering students.

This is a 4 credit-hour, calculus-based physics course for students majoring in science or engineering. This course covers basic mechanics and some modern physics. By the end of this semester, you will be able to:

- Understand a small set of fundamental physical principles:
  - *the momentum principle (Newton's laws, conservation of momentum)*
  - *the energy principle (conservation of energy)*
  - *the angular momentum principle (conservation of angular momentum)*
  - *the fundamental assumptions of statistical mechanics*
- Use these principles to explain a wide variety of physical phenomena
- Use these principles to predict the behavior of a variety of physical systems
- Model complicated physical systems by making approximations and idealizations in order to be able to apply fundamental principles
- Create 3D animated computer models of physical situations

Keep in mind this class is on a compressed schedule. We will move quickly. Missing a week of summer class is like missing a month of spring or fall class.

Prerequisite
You must complete MATH 151 or MATH 151H with a "C" or higher or be concurrently enrolled in MATH 151 or MATH 151H. No prior experience with computer programming is required. If you are enrolled in a summer course but did not meet the prerequisites in the spring, you are required to **drop this summer course**. Math skills required include:

- algebra
- basic knowledge of derivatives

+Tip(s): Get help early! The time to seek help is when a problem first arises, not at the end of the semester. Most confusion can be worked through in the beginning, making the rest of the course easier and enjoyable even.

- Visiting during office hours is the best way of contact, TA or myself.
- Visit the SI Coordinator/Leader: Skylar Dewees (sdewees1@umbc.edu)

Questions & Contact

- I will not answer specific physics questions through email. Physics related questions should be posted on the Blackboard (BB) Discussion Boards.
- For other questions, email is a great method of contact. Please include your full name, course and discussion section number, give detailed information, and use your UMBC email address to ensure prompt response.
- If I fail to respond to your email within 1 business day, most likely your answer can be found in the syllabus, in BB announcements, or can be best addressed on the BB Discussion Board.

Required Textbook & Other Material

- Matter & Interactions, by Chabay and Sherwood, 3rd edition
- WebAssign (online discussion & homework system)
- Clicker, Turning Technologies clicker
- Non-programmable and non-graphing calculator
- For VPython, see blackboard for downloading instructions

Recipe for Success

- Make sure you have the time required for the course. You are expected to attend all classes – lectures & discussions.
- Success = minimum 8 hours (outside of class).
- If you spend much < 8 hours studying for the course, you are unlikely to be successful.
- If you spend much > 12 hours studying, you should consult with the instructor about ways to improve efficiency.
- Physics is about understanding, not memorization. Instead of only paying attention to the results, it is more important to understand how to get the results.
- You have many resources. These include the textbook, study group, your friends, teaching assistants, me, the Internet. Use them wisely.
- You must develop an ability to think and learn for yourself. You must be actively engaged to learn the material, you cannot passively watch your classmates or me and expect to understand the concepts and develop problem-solving skills. Cognitive science has proven that the mind must interact to learn.
- Success will be achieved with effort and the right study strategies.

Grading Policy
I will not grade on a curve. If you all do an excellent job, you all deserve an A.

Type of Assignment	Percentage
Exam (4)	50%
Final Exam (1)	20%
Homework	10%
Discussion	15%
In Class Participation, Lecture Tutorials	5%
Total	100%

%	Letter Grade
≥ 90%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
59%	F

If you have an A average (≥ 90%) at 5 pm on July 01, 2014, you do not need to take the final exam. Check your grades on Blackboard routinely. You need to review your points for discussions and exams as soon as they are returned to you.

Please contact me or your TA for any grading questions within **1 week** of receiving your graded exam/homework/discussion.

Lectures

- You are required to read the textbook sections prior to every class.
- The class time will be spent on clarifying and applying the materials.
- Your participation in the lectures is required with the use of clicker or through tutorial material. Your answers to the questions provide an indication of attendance and textbook reading.
- See Blackboard announcement on how to register your clicker. You need to bring your clicker to every class.
- You are expected to take your own notes. You are responsible for capturing all the necessary material. My notes will not be provided to the class.

Homework

- Individual homework will be submitted via the WebAssign online system, see Blackboard. If you have issues with Blackboard, please see me or the TA ASAP.
- Homework will be assigned about a week in advance of when it is due. Since this is a compressed schedule, we will speed through material at a fast pace. Homework can be lengthy at times, so do not wait until the last minute.

- All homework will be due at 2am the day it is due. Check WebAssign for due dates. I will try to remind you of homework during class lectures.
- Homework is important for exercising what you learn in class. Some will be hard, others easy. Doing it is the best way to do well on the exams.
- You are encouraged to work together, however, you must fully understand how to solve problems on your own to prepare for exams.

Discussions

- You must attend the discussion section.
- 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.
- Some of the discussion material will be on the exam(s). Consequentially, be prepared.

Exams

- You have to do well on all exams to be able to get a good grade for the course. Lecture tutorials, lecture, discussion activities, and homework will help you acquire the understanding and problem solving skills you'll need.
- You may bring a single 3" x 5" index card and use a non-programmable and non-graphing calculator during exams. No cell phones or other communication devices are allowed. If observed with these items, your exam will be forfeit with no make-up.

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

It is understandable that you may miss a class. The course policy has been set up to accommodate a few unexpected situations. Those of you representing UMBC in officially sanctioned university activities should speak with me as soon as possible to address possible conflicts.

- Lecture: You will be given 4 free days for not clicking in lecture. These count towards **ALL** absences and clicker malfunctions. If you attend class but forget your clicker, you do not get clicker participation points.
- Lecture Tutorials: You will be required to work in small groups and turn in a single worksheet with everyone's name on it at the end of class, the SAME day the tutorial is given. No make-ups.
- Homework: See WebAssign for due dates. No make-ups. Be proactive. You may work at your own pace, but be warned, these homework sets are long due to the

nature of the course. Plan accordingly. Late submissions will not be accepted. No individual accommodations are possible.

- Discussion: There is no make-up discussion. Full credit is assigned for completing 90% of the total WebAssign discussion poin ts. This allows you to try a few times and miss a few questions for whatever reason. No individual accommodations are possible.
- 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 and arrange a makeup exam over the same material

Classroom Courtesy

Every student is entitled to a good learning environment.

- No tolerance for disrespect. If you are disrespectful, you will be asked to leave and credit for classwork, discussion, etc. will be given at my discretion.
- Arrive at class on time, pack and leave when the instructor says class is over.
- You are adults. Don't talk over the lecture, unless you have a legitimate question. Save your conversations for the breaks.
- Unless instructed otherwise, use of laptops, tablets, ipads, etc., is allowed only for valid course-related activities. You should not be checking e-mail, tweeting, facebooking, etc. during lectures or the discussion sessions

Tutorial Center (Free)

The Physics Tutorial Center is on a walk-in basis and provides one-to-one help.

- The Learning Resource Center supplies private tutors. Please contact at (410) 455-2444 or visit http://www.umbc.edu/lrc/ to make individual arrangement.

Academic Integrity

No tolerance for lack of 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 2 weeks 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**.

Summer STEM:

Academic Support Resources
Summer is a condensed, intensive semester. To help you succeed, here is a list of academic support resources available during summer session.
http://www.umbc.edu/summerstem/support

Summer STEM Events
Special events promote important professional and career skills. Students can learn how to form a study group, or how to prepare a scientific poster. They can also attend the Summer Undergraduate Research Fest (SURF) in August.
http://www.umbc.edu/summerstem/events

Summer STEM Program Coordinator

Andrea McMillen
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Draft Agenda – Subject to Change prior to class start

	Date	Lecture Topic	Textbook
Week 1	Tu 05/27	3D vector properties, Motion & Modeling, Uniform motion and graphs	1.1 – 1.9
	Th 05/29	Momentum Principle, Applying Momentum Principle, Free fall and projectile motion	2.1 – 2.6
Week 2	M 06/02	Gravitational Force, Electric Force, Strong Interaction	3.1 – 3.8
	Tu 06/03	3-body problem, Determinism, Complex Systems Springs, Interatomic Bonds	3.9 – 3.12 4.1 – 4.5
	Th 06/05	**Exam 1 (Ch. 1-3)** Young's modulus, Momentum	(40 min) 4.6 – 4.9
Week 3	M 06/09	Momentum	4.10 – 4.13 5.1 – 5.4
	Tu 06/10	Energy	5.6, 6.1 – 6.8
	Th 06/12	**Exam 2 (Ch. 4 – 5)** Energy	(40 min) 6.9 – 6.13
Week 4	M 06/16	Energy	6.14 – 6.17
	Tu 06/17	Internal Energy	7.1 – 7.11
	Th 06/19	**Exam 3 (Ch. 6 - 7)** Energy & Spectra	(40 min) 8.1 – 8.4
Week 5	M 06/23	Energy & Spectra Multiparticle Systems	8.5 – 8.7 9.1 – 9.3
	Tu 06/24	Multiparticle Systems Collisions	9.4 – 9.5 10.1 – 10.5
	Th 06/26	**Exam 4 (Ch. 8 – 9)** Collisions	(40 min) 10.6 – 10.11
Week 6	M 06/30	Angular Momentum	11
	Tu 07/01	Entropy	12
	Th 07/03	**Final Exam (Ch. 1 – 12)**	