Introductory Physics I for the Health Professions
PHYS 1010
Jill Tenny, M.S.

I. Overview.

What is your motivation to take this course? To get a high grade or to develop a foundation of physics concepts? All research indicates the latter focus will lead to a more successful career. Please funnel your efforts into embracing the modeling process and then using the process to help you understand the physical concepts presented in the labs and developed in the post-lab activities.

The goal of this course is to provide students with sufficient physical reasoning skills and content knowledge to perform well on entry assessments such as the Medical College Admissions Test (MCAT). It is essential for students to understand that these assessments are heavily invested in a secure understanding of conceptual physics, as well as graphical, mathematical, diagrammatical, and verbal representations of physics ideas. Consequently this course places a heavy emphasis on authentic, high quality in-home lab equipment capable of taking high quality data to help students develop a robust scaffold of physics knowledge.

The textbook is designed to provide applications of physics concepts to genuine biological and medical problems. The textbook is NOT meant to be the primary reference for the course, but as a course supplement. As mentioned in the previous paragraph, the laboratory activities are designed to provide the major conceptual and theoretical framework. The lab activities are introduced in workbook readings and the DVD supplement, and are assessed through a variety of practice and graded homework, quizzes, and exam activities.

II. Instructor and Support Contact Information

Instructor: Ms. Jill Tenny
Contact: E-mail: jrandall5@une.edu
Office Phone: 207-602-2040
Office Hours: By appointment – email or call me to set up an appointment.
Free online resources: http://hyperphysics.phy-astr.gsu.edu/hbase/acons.html#c1 and http://openstaxcollege.org/textbooks/college-physics

Student Support Specialist: Courtney Ayers
Email: cayers2@une.edu
Phone number: 207-221-4968

Technical Assistance:
If you have a problem with Blackboard or your software, please contact Technology Assistance at 207-602-2689. For e-mail technical assistance they can be reached at: comdistancetechhelp@une.edu

III. Lectures and Laboratories:

Lectures: The online blackboard course includes PowerPoint presentations for each unit of study. These, along with the DVDs, textbook, and workbook are used to supply background information on each topic and support the information you will glean from performing the labs. Please note that this class is set up in a way in which the labs you perform are the building blocks of each topic (see Course Outline below) and should ALWAYS be done before any HW assignments or quizzes.

Physics for the Life Sciences by Martin Zinke-Allmang (ZA), 1st Ed., has been chosen because it applies concepts to biologically relevant problems. This first semester course only covers a small portion of the text, from Chapters 1-6, representing the most challenging portions of physics for health science students. Part of the challenge stems from preconceptions that are often out of sync with science definitions and meanings. Connecting concepts is essential not only for this course, but also to be successful in your chosen career. This course will give you a substantial amount of practice making connections.

The DVDs, lectures, and workbook use a modern intuitive symbolic nomenclature, whereas ZA uses traditional physics nomenclature. As an example, in the DVDs, lectures and workbook force types are written as an "F" with a subscript that denotes the nature of the force, e.g. "Fg" for gravitational force (weight), "Fs⊥" for perpendicular surface force (normal), or "FT" for tension. ZA uses the "W" for weight, "N" for normal and "T" for tension. The reason for choosing the modern method is to avoid confusion. For example, "W" is the common unit of power, the watt, and "T" is the symbol commonly used for temperature. The same type of modern nomenclature is used for energy (e.g. Eg = gravitational energy). Becoming skilled at nomenclature variations is important since each student will almost certainly use different symbols common to their chosen profession later on – the concepts do not change because different symbols are used. Assignments below come both from Zinke-Allmang and summaries in the workbook heavily invested in the use of "multiple representations."

Laboratories: This online course is different from other web courses because it demands substantial investment of your time in hands-on activities using the lab quality dynamics track package that you rent with the course. Tactile manipulation of the lab equipment plays an essential role in helping to develop mental pictures (i.e. "visualization") of physical principles at work. Support for these activities is provided by the extensive DVD series that come with the course and discussion groups found on Blackboard. It is expected that the lab will represent one of the most challenging, but also most instructive, portions of the online course. The lab activities will be followed by online videos, summary readings, and support readings in the text. Nine units comprise the first semester mechanics sequence, with details below, each unit taking about one to three weeks each to complete. In these units are 12 laboratory activities supported by the dynamics track system. Each lab consists of a pre-lab activity, a paradigm lab/consensus activity, and model application through homework and quizzes. The DVDs help to outline the "operational definitions" required to communicate the ideas you will be examining.

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different independent variable values, and the independent variable must span at least one order of magnitude (i.e. a factor of 10 between the smallest and largest independent variable). When appropriate, the data should be further refined by taking average dependent variable results from multiple readings. Lab book activities are to be scanned in or digitally photographed and uploaded for grading according to the lab notebook layout found in Module 1.

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IV. Required materials

To purchase: Quadrille-ruled notebook, spiral bound notebook or loose leaf paper in binder for working problems and scratch paper, three ring binder for workbook if you want to print it out. You will also need the required lab equipment kit and the corresponding DVD set.

Textbook: Physics for the Life Sciences, 1st Edition, Martin Zinke-Allmang - University of Western Ontario. Textbooks and DVDs need to be purchased separately and are not part of your registration fee. All course materials are available through our bookstore at http://www.newengland.bkstr.com

Technology: A laptop computer with video camera, speakers and reliable high-speed Internet connection. Please download a copy of the "LoggerPro" from within the course content folder (LoggerPro and Simulations) for use throughout the course (lab and homework). After enrolling in the course you will be given password privileges to install the software on your computer. Contact comdistancetechhelp@une.edu if you need any assistance.

V. Course Objectives

By the end of the course, students will be able :
-Identify the type of basic physical model being examined.
-Graphically predict the relationship between key variables.
-Extract mathematical and physical relationships from graphical results.
-Present the physical concepts through diagrammatic and verbal representations.
-Apply the physical concepts to related problems.

Through participation in this course based on the core competencies, the student will investigate and develop competence in five fundamental "models" in mechanics:
• The Free Particle (Kinematics – constant velocity, Dynamics – zero sum force)
• The Constant Force Particle (Kinematics – constant acceleration, Dynamics – nonzero sum force)
• The Restoring Force Particle (Hooke's Law and Energy)
• The Impulsive Force Particle (Collisions and Impulse)
• The Central Force Particle (Centripetal Force).

Why a "model" approach? Indeed, what is a model? A model is a mental representation of a physical system – we make models all the time. Part of model development involves communicating concepts in a variety of ways, including written, graphical, and diagrammatic representations in addition to mathematical predictions. Developing models has a distinct advantage over remembering traditional physics facts. The models developed in lab are based on tactile experiences that are designed to leave long lasting impressions. Facts can easily be forgotten.

VI. Course Outline

The objectives of this course are to facilitate your construction of models in a very specific sequence:

-FIRST through laboratory observations and data analysis supported by the DVDs.
-SECOND through viewing the lecture videos, workbook readings, and textbook readings.
-THIRD through the workbook, online homework, and quizzes, all designed to provide you formative assessments to help you test your comprehension before…
-FOURTH the summative proctored online exams.

Key: ZA = Text by Zinke-Allmang

Unit	Lab/Concept Topic	Lecture	Readings	Homework	Quiz
1	The Scientific Method – The Modeling Process	Unit 1	Unit 1 and ZA-Chapter 1	WB Unit 1	None
2	Constant Velocity Particle	Unit 2	Unit 2 and ZA-Chapter 2	WB Unit 2	Unit 2
3	Constant Acceleration Particle	Unit 3	Unit 3 and ZA-Chapter 2	WB Unit 3 Parts C&B	
3	Constant Acceleration Particle	Unit 3	Unit 3 and ZA-Chapter 2	WB Unit 3 Parts A	Unit 3
4	Toolbag: Vectors and Trigonometry	Unit 4	Unit 4	WB Unit 4	Unit 4
5	Free Particle Interactions: Weight and Friction	Unit 5	Unit 5 ZA-Chapter 3 pp. 39-57 pp. 103-106	WB Unit 5	Unit 5
6	Constant Force Particle: Acceleration	Unit 6	Unit 6 and ZA-Chapter 3 pp. 57-72	WB Unit 6 Parts C&B	
6	Constant Force Particle: Acceleration	Unit 6	Unit 6 and	WB Unit 6	Unit 6

			ZA-Chapter 3 pp. 57-72	Parts A	
1-6	Exam 1		180 minutes		
7	Energy: Restoring Force Particle	Unit 7	Unit 7 and ZA-Chapter 6	WB Unit 7 Parts C&B	
7	Energy: Work and Motional Energy	Unit 7	Unit 7 and ZA-Chapter 6	WB Unit 7 Parts A	Unit 7
8	Impulsive Force Particle: Momentum	Unit 8	Unit 8 and ZA-Chapter 4	WB Unit 8 Parts C&B	
8	Impulsive Force Particle: Momentum	Unit 8	Unit 8 and ZA-Chapter 4	WB Unit 8 Parts A	Unit 8
9	Center Seeking Force Particle: Uniform Circular Motion	Unit 9	Unit 9 and Optional: ZA-Chapter 5	WB Unit 9 Parts C&B	
9	Center Seeking Force Particle: Gravitation	Unit 9	Unit 9 Optional: ZA-Chapter 5	WB Unit 9 Parts A	Unit 9
1-9	Comprehensive Final Exam		240 minutes		

VII. Examination and Grading Information.

To become an expert in any subject, from aardvark wrestling to zymurgy requires good time management skills. Successful comprehension of physics concepts requires practice, diligence, and motivation. You should spend AT LEAST one to three hours/night on your physics homework. Assignments can be found through Blackboard. They consist of "Practice Homework," with solutions provided, graded homework, and quizzes.

Please try to complete as much as possible of the practice homework WITHOUT looking at the answers. Refer to the solutions only if you reach an impasse. Graded homework and quizzes are found online and are worth 25% of final grade (OFG).

There will be one timed midterm exam (three hours) and one timed final exam (four hours) for 50% OFG. The final exam is CUMMULATIVE. Exams begin and end promptly at scheduled times. Be prepared to stay in the exam room for the entire time. You may bring a calculator, one page (8.5"x11") sheet of formulas and diagrams (one side only, you will have to show the back side is blank to the proctor), a blank piece of paper, and a writing implement for scratch work to the exams. SCAN IN/DIGITALLY PHOTOGRAPH THE SCRATCH WORK AND EMAIL TO ME WITHIN 10 MINUTES OF COMPLETING THE EXAMS. These are used to provide partial credit. The exams are administered online via web proctoring – you will be required to follow all the proctor's requests. Details are provided below.

Calculating your grade:
Lab Average *0.25 + HW and Quiz Average*0.25 + Exam Average*0.50 = FG.

Proctored Examinations: The University of New England has contracted with ProctorU (proctoru.com) to provide students with the most convenient online exam proctoring system. This system provides a simple, no cost to the student, secure, online proctor for all exams and allows the student to take all of the exams at home and on their own schedule.

Upon enrollment into the course, each student will register with ProctorU and establish a login name and password. This will give you access to all of ProctorU's services. When ready, students will schedule their exams with ProctorU **one week** prior to taking that exam. Upon the exam day and hour, students will log in to proctor U and click on "exams". Following the procedures outlined at ProctorU's web site, the student will log in to Blackboard, open the appropriate exam and the proctor will then allow student access to that exam.

System Requirements for Use of ProctorU:

- PC: Windows XP, Windows Vista or Windows 7 with 256 MB of RAM or higher
- Mac: Mac OS10 or higher
- A web cam with 640x480 video pixel resolution
- Headphones or working speakers connected to the computer
- A microphone connected to the computer (we recommend having a web cam that has a built in microphone)
- A high-speed Internet connection (NO DIAL-up). We recommend connecting your computer directly to your router with an Ethernet cable for any proctored exams, specially the practical exams.
- A web browser with Adobe Flash Player installed. (Google Chrome recommended for ProctorU website)
- Authority to allow remote access to your computer and screen by one of our proctors

Written Proctored Exam: Students may take the exam at the University of New England College of Osteopathic Medicine's Campus. The exam is offered the first Saturday of every month. If the first Saturday of the month is a holiday, the exam will take place on the second Saturday of the month. Please contact us for information at comdistance@une.edu.

Grading Scale
90% -100% = A
80% - 89% = B
70% - 79% = C
60% - 69% = D
Below 60% = F

VIII. Course Length

A schedule of lectures and assignments is included in this syllabus. This is, however a self-paced course and you can complete the course in less time.
1. Courses in CDE program are equivalent to one-semester courses designed to be completed in 16 weeks

2. Enrollment in the course begins the day your section opens, which is listed in the Academic Calendar, found on www.une.edu/registrar/upload/2014-2015-COM-Post-Bac-Academic-Calendar-FINAL-2-6-2014.pdf.
3. Students for whom a grade has not been posted by week 14 will be flagged by the administrative staff.

IX. Learning Disabilities.

Any student with a documented learning disability needing academic adjustments or accommodations is requested to notify the professor prior to or during the first week of being in the course. All discussions will remain confidential. All students with a documented learning disability will need to provide all necessary documentation before special accommodations will be granted. Accommodations will be granted for the midterm and final exams only, as the quizzes are not timed.

To request accommodations at the University of New England, please contact:
Jaime L. Flaig, M.Ed
Coordinator of Disability Services
Phone: (207) 221-4418
Fax: (207) 523-1919
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Email: jflaig@une.edu

X. Withdraw Policies.

To withdraw from a course, please e-mail UNERegistrar@une.edu with your intentions to withdraw and include the course subject and number (Example: ANAT 1005). This action will result in a W grade for the course.

Refund Policy:
- 100% refund prior to the official start of the course.
- 40% refund within the first week of the official course start date.
- No refund after the first week of the official course start date.

For further information concerning refunds, please see
http://www.une.edu/businessoffice/refunds.cfm.

XI. Transcripts.

Due to the Family Privacy Act, the student may only request official transcripts. This may be done online by going to the University of New England Registrar http://www.une.edu/registrar/ and following the directions on the page. The URL is:
http://www.une.edu/registrar/upload/transcript.pdf. Fill in and sign the request and either mail or fax it to the University Campus address on the form

To view your unofficial UNE student transcript:
- Log into uonline at http://uonline.une.edu
- Select Student Services
- Select Student Records
- Select Academic Transcript