PHYS 206L: University Physics I with Lab
College of Arts & Sciences Syllabus

COURSE INFORMATION

Credit Hours: 5

Course Description: This is the first term of a two-term calculus based lecture and laboratory sequence intended for students majoring in physics, biology, chemistry, earth science or mathematics, PHYS 206L and 207L. Kinematics and dynamics of a particle and systems of particles, momentum, energy, angular momentum, conservation laws, applications to problems involving collisions, oscillatory motion and motion in a gravitational field, rigid body motion, temperature, heat, the laws of thermodynamics, application to thermodynamic engines, and ideal gases are discussed. Lecture: 3 hrs. Lab: 2 hrs.

Course Prerequisites: MATH-187

FACULTY INFORMATION

Instructor: Paulo H. Acioli

Office Location: BBH 217D

Office Hours: Wednesday from 12:30pm-2:30pm and Thursday 10am-12pm or by appointment.

Phone Extension: 773-442-4733

E-mail: p-acioli@neiu.edu

COURSE MATERIALS

List of Required Texts / Materials:

Matter & Interactions, Ruth Chabay and Bruce Sherwood, John Wiley and Sons, Inc.

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

- Apply fundamental principles to a wide range of systems: from nuclei to stars
- Unify mechanics and thermal physics
- Engage students in laboratory exercises and physical modeling (idealization, approximation, assumptions, estimation)
- Make computational physics/modeling an integral component of the course in addition to theory and experiment

STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Assignments:

Labs: SEC 01, R 12:00-1:50 pm, in BBH 237

Weekly Lab activities will be held every Thursday with the exception of weeks when an exam is scheduled. The Laboratory Guides will be posted on D2L one week in advance. If it is not posted by 5pm on Friday please send an e-mail to the instructor. Ten Lab assignments (up to 125 points) will count toward the final grade.

Mini-Research Projects

Every student will have to develop a mini-research project that will apply the concepts learned in this course. A peer leader will aid the students in this project providing guidance on how to choose a topic, how to develop it, test it, and on how to report the findings in this project. Some of the Laboratory time will be devoted to this purpose as well. We will focus the projects on the Physics of Earthquakes. Shake tables to simulate earthquakes will be provided and students should develop suitable projects such as: Structural Stability of Buildings subject to Earthquake conditions; the role of soil moisture on suitability to build on; studying/simulating the different waves on earthquake; wave propagation in different materials; Student will also be given the opportunity to pursue a project of their own design.

Problem Sets

Weekly problem sets are assigned on D2L. Problem Sets should be completed by the following week.

Reading (Warmup) Quizzes

Online reading quizzes (each worth 7.5 points) are administered before every class, with the exception of the first day of class and on classes where there is a midterm. Reading quizzes are based on the material to be covered in class. They are warm up exercises to prepare the student for the class. They are due at 10pm of the night preceding the class. There will be no reading quiz make-ups. The reading quizzes will be administered through D2L. All the students are automatically registered in blackboard. You can access the D2L webpage through the address: https://neiu.desire2learn.com. The highest ten warmups (up to 75 points) will count towards the final grade.

Exams

This course has two two-hour midterm exams and a two-hour comprehensive final (each worth 100 points). The lowest exam grade will be dropped. You can drop the final exam if you are satisfied with your two midterm grades. The exams are largely based on material from lectures and problems similar to those found in the weekly assignments. Exam policies can be found on D2L.

Grading Policies and Formulae:

The final grade will be based on:

Two highest exam grades (20% each) + Labs (25%) + Mini-research project (20%) + Reading Quizzes (15%)

Any student who achieves a percentile score of above 90% (450 points), 80% (400 points), 70% (350 points), 60% (300 points) is guaranteed to receive an A, B, C, or D respectively. These percentile scores (or points) may be adjusted downwards based on a class curve and other considerations.

Course Outline:

University Physics I: Tentative Schedule		
Week of	Assigned Reading	Notes
Aug-22	Introduction	Lab 1 on Aug 25
Aug-29	Interactions and Motion/The Momentum Principle	Lab 2 on Sep. 01
Sep-05	The Momentum Principle	No Class on Mon Sep-05 Lab 3 on Sep. 08
Sep-12	Fundamental and Contact Interactions	Lab. 4
Sep-19	Rate of Change of Momentum	Lab. 5
Sep-26	Rate of Change of Momentum	Lab. 6
Oct-03	The Energy Principle	Mid-Term on Oct-13
Oct-10	Internal Energy	No Class on Oct. 10 Lab 7
Oct-17	Internal Energy/Energy Quantization	Lab 8
Oct-24	Multiparticle Systems	Lab 9
Oct-31	Collisions	Lab 10
Nov-07	Angular Momentum	Lab 11
Nov-14	Entropy	Lab 12
Nov-21	Work on Research Projects	No Lab on Nov. 24
Nov-28	Entropy/Gases and Engines	Lab 13
Dec-05	Gases and Engines	Report on research projects
Dec-12	Finals week	Mid-Term on Dec-12 Final Exam on Dec-15 at 2PM

Timetable for Lab/Mini-Research Projects

Date/Lab	Activity
Aug 25/ Lab 1	Introduction to Research Skills
Sep 01/ Lab 2	Vectors and Vectors in 3-D
Sep 08/Lab 3	Momentum principle
Sep 15/Lab 4	Fundamental Interactions
Sep 22/ Lab 5	Springs and its applications
Sep 29/ Lab 6	Rate of Change of Momentum
Oct 06/ Lab 7	Energy principle and energy transformations
Oct 13	No Lab – 1st Exam
Oct 20/ Lab 8	Friction and conservation of energy
Oct 28/Lab 9	Energy Transfer
Nov 03/ Lab 10	Collisions in 1Dimension
Nov 10 / Lab 11	Mini-Research lab 1
Nov 17	Mini-Research Lab 2
Nov 24	No lab – Thanks Giving
Dec. 01	Final Touch Ups in Mini-Research Projects
Dec. 08	Report on research projects

COURSE POLICIES AND STATEMENTS

Absence Policy:

Regular attendance of lectures is strongly recommended but is at the discretion of the student. Attendance to the Laboratory sessions is mandatory.

Academic Integrity Policy:

By enrolling in this course, you are bound by the NEIU Student Code of Conduct: http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. To request accommodations, students with special needs should make arrangements with the Student Disability Services (SDS) office, located on the main campus in room D104. Contact SDS via (773) 442-4595 or http://www.neiu.edu/university-life/student-disability-services.

Campus Safety:

Emergency Procedures and Safety Information can be found on NEIU*port* on the MyNEIU tab or as follows: http://homepages.neiu.edu/~neiutemp/Emergency_Procedures/MainCampus/.

Course Communication
All pertinent class communications between the instructor and students is conducted exclusively through NEIU e-mail. Thus it is the responsibility of students to check their NEIU e-mail account for all significant information and updates on class cancellations in the event of threatening weather conditions. Communication between the instructor and students via personal e-mail accounts (e.g., @gmail.com or @yahoo.com) will not occur.

Incompletes

An Incomplete ("I") grade is temporary and exceptional, and can be given only to students whose completed coursework has been qualitatively satisfactory but who have been unable to complete all course requirements because of illness or other circumstances beyond their control. An "I" grade is not to be awarded in place of a failing grade or when the student is expected to attend additional class meetings or to re-register to complete the course requirements. Additionally, an "I" grade is not a means for the student to raise his/her grade by doing additional work.

A request for an "I" grade must be made by the student to the faculty member before the last official day of the semester or term. The faculty member retains the right to make the final decision on granting a student's request for an "I" providing the student meets the provisions above, even though the student may meet the eligibility requirements for this grade. Students have up to one semester, excluding summer, to complete the work.

It is the responsibility of the student to complete and submit the remaining coursework before the assigned deadline. The faculty member will submit a grade change converting the "I" to a letter grade by or before the last day of the semester in which the outstanding coursework is to be completed. If the student does not meet the deadline, the "I" will be converted automatically to a final grade of an "F." Since the "I" grade is temporary, faculty may not issue a terminal "I" grade.

Upon receipt of the grade change, the Registrar Services Office will post the grade to the student's record and recalculate the GPA. Although students have up to one semester, excluding summer, to complete the work to change the grade of Incomplete, the student's academic standing will be reassessed only if the grade change is received by the Friday of the first full week of the semester immediately following the one in which the "I" grade was assigned.

Students will not be allowed to graduate with "I" grades on their records.

Extension of an Incomplete Grade: A request to extend the assigned deadline must be put in writing to the appropriate academic dean before the assigned "I" grade becomes a failing grade. The request must provide the reason as to why a deadline extension is requested, along with

including appropriate documentation (e.g. medical documentation, etc.). A letter of support from the faculty member that includes a new deadline date is also required. The Dean or his/her designate will make the appropriate decision at his/her discretion and reply in writing to the student, faculty member, and the University Registrar within 14 working days. Requests that extend beyond one calendar year from the time the incomplete grade was assigned will not be honored.

These policies apply to “I” grades given in the Fall 2016 semester or later.