

Physics 231 Fall 2017 Prof. Walter Wimbush phone [703-845-6526](tel:703-845-6526)
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Text: Young and Friedman, University Physics 13th ED, Pearson, 2014.

Laboratory Text: Wimbush, Lab Manual for 231-232,
Laboratory procedures can also be found at: <http://blogs.nvcc.edu/alphy/laboratory/>

You can get video tutoring from these web sites:

<http://www.hippocampus.org>

<http://www.brightstorm.com/physics>

<http://www.khanacademy.org>

And a nifty site to do calculations. . . like a powerful computer

<http://www.wolframalpha.com>

Attendance: Students are expected to arrive on time and to attend all lectures and laboratory sessions. Students are responsible for all material covered in either the textbook or in the lectures. If you miss a lecture, you should get the material from another student.

Classroom etiquette: All cell phones and pagers are to be turned off prior to class. Students are to arrive on time for class.

Withdraw/Audit Grades: No audit will be permitted after **Sept. 7**. Last day to withdraw with tuition refund : **Sept 7**. No withdraws will be permitted after the last day to withdraw, Oct. 31. Students who miss three consecutive lectures may be withdrawn from class.

The last day to withdraw with a grade of "W" is **Oct. 31**.

You are responsible for withdrawing yourself from the class.

Exam Policy: There will five or six "hourly" exams and one "2-hour" FINAL exam.

There will be NO make-up exams. If you miss an exam, you may take a second version of the exam in the testing center one week from the date of missed exam. Do not miss two exams. Some formulas will be provided by the instructor. **You need only bring pencils, pen, and a working calculator with you to the examination.** Any indication of cheating will result in a grade of zero for the exam. The second episode of cheating will result in a grade of "F" for the course.

Grading Policy: A = 90 - 100% B = 80 - 89% C = 70 - 79% D = 60 - 69%
Final grade = 65%(lect.) + 25%(lab) + 10%(homework)

Special Needs and Accommodations: Please notify the instructor of any special problems or needs at the beginning of the semester. If you are seeking accommodations based on a disability, you must provide a disability data sheet, which can be obtained from the counselor for special needs, who is located in Room 148 of the Bisdorf Building, telephone number [845-6301](tel:845-6301).

The **Academic Center for Excellence (ACE)** and the **Academic Center for Reading and Writing (ACRW)** provide *free* peer tutoring and reading and writing assistance. ACE and ACRW are located in AA229. For more

information or to schedule an appointment, stop by (AA229), call them (703.845.6363), or visit them online: <http://www.nvcc.edu/campuses-and-centers/alexandria/campus-resources/academic-support/index.html>.

Lecture Schedule: No class on following days: Sept. 5, Oct. 10-11 Nov. 23-25

Monday Aug. 21

Ch. 1: Vectors HW 1: 1.4, 1.11, 1.15, 1.23, 1.31, 1.35, 1.45, 1.47, 1.58, 1.68, 1.101

Wednesday Aug. 23

Ch. 2: Motion 1-D HW 2: 2.8, 2.22, 2.28, 2.39, 2.44, 2.53, 2.54, 2.59, 2.64, 2.80,

LAB: Uniform Acceleration

Aug 28

Ch. 3: motion 2&3 Dim HW 3: 3.4, 3.8, 3.16, 3.27, 3.29, 3.35, 3.36, 3.47, 3.84, 3.87

Aug 30

Ch. 4: Force Hw 4: 4.2, 4.7, 4.10, 4.19, 4.23, 4.28, 4.38, 4.39, 4.54, 4.58

Lab: Addition of Vectors

Sept 4 **Labor Day**

Sept. 6 **Exam 1** Kinematics and Vectors ch. 1,2,3

Lab: Newton's Second Law

Sept 11 Ch 5: Using Newton's Laws Hw 5: 5.8, 5.15, 5.34, 5.42, 5.46, 5.72, 5.73, 5.92, 5.98, 5.119

Sept. 13 Uniform circular motion

Lab: centripetal force (Goggles)

Sept 18 **Exam II – Ch. 4 – 5**

Sept 20, Ch. 6: Work Kinetic Energy HW 3, 8, 15, 33, 37, 56, 74, 76, 85,99

Lab: conservation of energy

Sept 25 Ch. 7: Potential energy, HW 7: 7.4, 7.9, 7.10, 7.11, 7.16, 7.23, 7.30, 7.35,
7.36, 7.39, 7.45, 7.51, 7.55, 7.63

Sept 27 Ch. 7: conservation of energy
Lab conservation of momentum

Oct. 2 Ch. 8: Momentum & collisions HW 8: 7, 8, 13, 21, 29, 36, 41, 42,44, 47, 49, 51, 53, 62, 106

Oct 4 **Exam III – Ch. 6 – 8**
Lab: Conservation of Momentum 2 - dimensions

Oct 9 Columbus day no class

Oct 11 Ch. 9: Rotation HW 9: 3, 4, 7, 11, 15, 18, 24, 30,34, 49, 60, 61, 84, 95

Lab: Moment of Inertia (lab GOGGLES)

Oct 16 Ch. 10 Rotational Dynamics HW 10: 3, 10, 27, 33, 37, 43, 46, 49, 57, 70, 76

Oct 18 Ch 11: Equilibrium & Elasticity HW 11: 11, 13, 19, 31, 40, 53, 56, 76, 79,
Lab: Torques

Oct 23 **Exam IV - Ch. 9 – 11**

Oct 25 Ch 12: Fluids HW 12: 4, 11, 31, 35, 44, 59, 74, 90

Oct 30 Gravitation Hw 13:5, 19, 26, 32, 57, 59, 71

Nov 1 Ch. 14: Periodic Motion HW 14: 4, 7, 11, 19, 21, 27, 36,40, 45, 57, 60, 94

Lab: Simple Harmonic Motion

Nov 6 Ch. 14: Periodic Motion

Nov 8 **Exam IV Ch 12-14**

Nov 13 Ch. 17 Temperature & Heat Hw 17: 2, 8, 11, 14, 26, 30, 38, 41,51, 62, 67, 75, 85

Nov 15 Ch 18 Thermal Properties Hw 18: 1, 7, 12, 32, 38, 41, 47,51
Lab: Ideal Gas Law

Nov 20 ch. 19 first law of thermodynamics hw 19: 1, 3, 5, 8, 21, 31, 39,41

Nov 22 Thanksgiving

Nov 27 Ch. 20: 2nd Law Thermodynamics HW 20: 1, 5, 9, 13, 23, 33

Nov 29 Ch. 20
Lab: Specific Heat & Latent Heat

Dec 4 Entropy

Dec 6 Review for Final

Dec 11 **Final Exam**

LABORATORY

The lab report should include:

1. **Abstract:** A brief statement of what the experiment "proves" and the validity of the method or procedures used.
2. **Theory:** Derive the formulas used in the experiment.
3. A **labeled diagram** of the apparatus. (labels in ink artwork in pencil)
4. **procedure:** Should be written in 3rd person, passive voice, past tense example: The thermometer was read in three minute intervals and the value recorded in table II. (do not write "I read the thermometer" or "read the thermometer every three minutes.")
5. **Data tables:** (data in pencil; labels and lines separating columns and rows in ink)
Graphs: (labels, scales for x- and y - axis: in ink , curve in pencil) Best done on Excel
6. Determination of **experimental Error**.
7. **Conclusion:** (not a statement of error but what principles have been verified).

Laboratory Regulations

All safety regulations will be enforced! You will be responsible for purchasing your own safety goggles and having them in class. Sandals will not be permitted in the laboratory. Anyone not obeying these rules will be told to leave the lab. You will forfeit the credit for that lab!!!

You will turn in Lab reports one week from the day you completed the lab. Use Microsoft word to include a statement of the purpose, theory, procedure, Data (tables and graphs), and a conclusion summary. You must indicate all of your lab partners on the report!