**Physics 231**     Fall 2016      Prof. Walter Wimbush      phone 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,   web page: [www.nvcc.edu/home/nvwimbw](http://www.nvcc.edu/home/nvwimbw)

You can get video tutoring from these web sites:

[http://www.hippocampus.org](http://www.hippocampus.org/)

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

[http://www.khanacademy.org](http://www.khanacademy.org/)

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

[http://www.wolframalpha.com](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. 8**.  Last day to withdraw with tuition refund : **Sept 8**.   No withdraws will be permitted after the last day to withdraw, Oct. 30.  Students who miss three consecutive lectures may be withdrawn from class.

The last day to withdraw with a grade of "W" is **Nov. 1**.

**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.

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](http://www.nvcc.edu/campuses-and-centers/alexandria/campus-resources/academic-support/index.html%20/t%20_blank).

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

**Monday** Aug. 22

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. 24

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 29

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 31

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 **5 Labor Day**

Sept. 7 **Exam 1** Kinematics and Vectors ch. 1,2,3

 **Lab: Newton’s Second Law**



Sept 12 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. 14 Uniform circular motion

 **Lab: centripetal force (Goggles)**



Sept 19 **Exam II – Ch. 4 – 5**

Sept 21, Ch. 6: Work Kinetic Energy HW 3, 8, 15, 33, 37, 56, 74, 76,  85,99

**Lab: conservation of energy**

Sept 26 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 38 Ch. 7: conservation of energy

 **Lab conservation of momentum**



Oct. 3 Ch. 8: Momentum & collisions HW 8: 7, 8, 13, 21, 29, 36, 41, 42,44, 47, 49, 51, 53, 62, 106

Oct 5   **Exam III – Ch. 6 – 8**

 **Lab: Conservation of Momentum 2 - dimensions**

Oct 10 Columbus day no class

Oct 12 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 17 Ch. 10 Rotational Dynamics HW 10: 3, 10, 27, 33, 37, 43, 46, 49, 57, 70, 76

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

 **Lab: Torques**

Oct 24   **Exam IV - Ch. 9 – 11**

 Oct 26     Ch 12: Fluids HW 12: 4, 11, 31, 35, 44, 59, 74, 90

Oct 31  Gravitation Hw 13:5, 19, 26, 32, 57, 59, 71

Nov 2 Ch. 14: Periodic Motion    HW 14: 4, 7, 11, 19, 21, 27, 36,40, 45, 57, 60, 94

 **Lab: Simple Harmonic Motion**



Nov 7 Ch. 14: Periodic Motion

Nov 9 **Exam IV   Ch 12-14**

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

Nov 16 Ch 18 Thermal Properties Hw 18: 1, 7, 12, 32, 38, 41, 47,51

 **Lab: Ideal Gas Law**



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

Nov 23 Thanksgiving

Nov 28 Ch. 20: 2nd Law Thermodynamics HW 20: 1, 5, 9, 13, 23, 33

Nov 30 Ch. 20

 **Lab: Specific Heat & Latent Heat**



Dec 5 Entropy

Dec 7 Review for Final



Dec 12 **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

you 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!