

**Physics 104a**      **Concepts and Methods in Physics**      **Spring 2009**  
with Mr. Steven B. Zides  
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office hours: TuTh 9:00-11:00, Tu 2:30-4:00, W 1:30-4:00 and by appointment

### **Description**

A study of topics selected to introduce students to the basic concepts in physics or astronomy and to the scientific method. Does not count toward a major in Physics or toward science requirements for the B.S. Degree.

**Class Schedule**

TuTh	1:00 - 2:20	RMSC 122
Th (Lab)	2:30 - 5:30	RMSC 125

**Textbooks**    *Understanding Physics, Picasso at the Lapin Agile, and The Art Book*  
by Cassidy, Martin, and Phaidon Press

### **Attendance**

Attendance is mandatory. You will be allowed three unexcused absences without penalty. More than three such absences will result in a 25% deduction (per additional absence) in your class participation grade. If you reach seven unexcused absences, you will be dropped from the course (WP or WF). Missed tests/exams and lab-work can only be made up if the absence is excused. To be excused, an absence must be justified (within 48 hours) and documented.

### **Grading**

Tests/Exam (high 20%, med. 15%, low 10%), Laboratory 20%, Class Participation 10%, Writing Assignments 15%, Quizzes 10%. Writing Assignments will be collected electronically using the <emma> system. Quizzes will be given at the beginning of specified Thursday class periods.

### **Academic Integrity**

The Wofford Academic Honor Code will be strictly enforced in this course. For more information visit: <http://www.wofford.edu/uploadedFiles/studentLife/honorCode0607.pdf>

### **Technology**

The calculator used in laboratory will be limited to the TI 30XA scientific calculator. You will also have to use the <emma> software system.

### **Class Format**

Class will be a mixture of lecture, discussion, collaborative group work, and multimedia presentation. As such, students should come to class prepared to participate in all classroom activities.

### **Goals**

- To expose students to many of the major conceptual ideas in physics.
- To engage students in the scientific method via hands on experiments.
- To consider the relationships between science and society.
- To compare and contrast physical and artistic metaphors.

As the course progresses, various aspects of these goals will be monitored through class discussions, quizzes, tests, collaborative group exercises, and several writing assignments.

## Anticipated Lecture Progress

1	02/03/09	Tue.	<b>Intro, Syllabus, and What is Physics?</b>
2	02/05/09	Thu.	<b>The Tools of Physics and Their Limitations</b> Rd. <em>emma</em> Measurement, Equation and Related Questions
3	02/10/09	Tue	<b>Motion I (position and velocity)</b> Rd. <i>UP</i> Ch. 1 (1.1-1.5) GQ [part II 2,3,7,9] DQ [3,4,5(a-d),6]
4	02/12/09	Thu	<b>Quiz 1 and Motion II (acceleration and free fall)</b> Rd. <i>UP</i> Ch. 1 (1.6-1.10) GQ [part II 6, part III 1,4,6,7,8] DQ [8]
5	02/17/09	Tue	<b>Motion III (artistic metaphor)</b> Rd. <em>emma</em> Position, Velocity, Acceleration and Related Questions
6	02/19/09	Thu	<b>Quiz 2 and Forces I (Newton's three laws)</b> Rd. <i>UP</i> Ch. 3 (3.1-3.7)
7	02/24/09	Tue	<b>Thesis Statement 1 and Forces II (projectiles and circular motion)</b> Rd. <i>UP</i> Ch. 3 (3.8-3.12)
8	02/26/09	Thu	<b>Quiz 3 and Forces III (artistic metaphor)</b> Rd. <em>emma</em> Mass, Force, Vector and Related Questions
9	03/03/09	Tue	<b>Rough Draft 1 and Gravity I (universal gravitation)</b> Rd. <i>UP</i> Ch. 4 (4.4-4.11)
10	03/05/09	Thu	<b>Gravity II (artistic metaphor)</b> [Essay 1: Initial Draft Due] Rd. <em>emma</em> Gravity, Field, Orbit and Related Questions
11	03/10/09	Tue	<b>Test 1</b> Study for test 1
12	03/12/09	Thu	<b>Conservation Laws I (momentum)</b> Rd. <i>UP</i> Ch. 5 (5.1-5.6)
13	03/17/09	Tue	<b>Final Draft 1 and Conservation Laws II (work and energy)</b> Rd. <i>UP</i> Ch. 5 (5.7-5.12)
14	03/19/09	Thu	<b>Quiz 4 and Conservation Laws III (artistic metaphor)</b> Rd. <em>emma</em> Energy, Momentum, Work and Related Questions
15	03/24/09	Tue	<b>Thermodynamics I (heat and heat engines)</b> Rd. <i>UP</i> Ch. 6 (6.1, 6.3-6.7))
16	03/26/09	Thu	<b>Quiz 5 and Thermodynamics II (kinetic theory of gasses)</b> Rd. <i>UP</i> Ch. 7 (7.1-7.7)
17	04/07/09	Tue	<b>Thermodynamics III (artistic metaphor)</b> Rd. <em>emma</em> Heat, Radiation, Entropy and Related Questions
18	04/09/09	Thu	<b>Quiz 6 and Waves I (waves and wave interference)</b> Rd. <i>UP</i> Ch. 8 (8.1-8.7)

19	04/14/09	Tue	<b>Thesis Statement 2 and Waves II (reflection, refraction, diffraction)</b> Rd. <i>UP</i> Ch. 8 (8.8-8.11)
20	04/16/09	Thu	<b>Waves III (artistic metaphor)</b> Rd. <i>&lt;emma&gt;</i> Wave, Pressure, Reflection and Related Questions
21	04/21/09	Tue	<b>Test II</b> Study for test 1
22	04/23/09	Thu	<b>Light</b> Rd. <i>UP</i> Ch. 8 (8.12-8.19)
23	04/28/09	Tue	<b>Rough Draft 2 and Special Relativity I</b> Rd. <i>UP</i> Ch. 9 (9.1-9.10)
24	04/30/09	Thu	<b>Quiz 7 and Special Relativity II</b> Rd. Picasso at the Lapin Agile (up to pg. 41)
25	05/05/09	Tue	<b>Final Draft 2 and Special Relativity III</b> Rd. Picasso at the Lapin Agile (rest of the play)
26	05/07/09	Thu	<b>Special Relativity IV and Final Remarks</b> Rd. <i>&lt;emma&gt;</i> Relativity, Space-Time and Related Questions

## **Additional Class Information**

### **Cell Phones**

Cell phones are not allowed in class at any time. This includes text messaging. If you have a cell phone, please turn it off before class and store it in your book bag. Violations of this rule will result in a reduction in your Class Participation average.

### **Grading Scale**

The final grade for this course is rounded to the tenths digit. You need the following scores to guarantee the indicated grade:

A (93.0%), A- (90.0%), B+ (87.0%), B (83.0%), B- (80.0%), C+ (77.0%), C (73.0%), C- (70.0%), D (65.0%)

### **Tests**

You will be given 55 minutes for each test. Tests are composed of the following:

10 multiple choice (3 pts. each), 3 (of 5) conceptual questions (15 pts. each), 1 art analysis (20 pts.), and following directions (5 pts.)

### **Quizzes**

Quizzes will be 1 (of 2) conceptual questions. These quizzes will be given at the beginning of specified Thursday classes. There are no early, late, or make up quizzes, so please get to class on time. When calculating the final quiz average, the lowest two quizzes will be dropped.

### **Class Participation**

Every student will initially be given a class participation score of 90%. Over the course of the semester, those who consistently attend and participate will be bumped up to higher scores. Students with poor attendance or minimal participation will be bumped down to a lower score.