



ORANGE  
COUNTY  
COMMUNITY  
COLLEGE

• State University of New York

**General Physics (Calc.)**

**35\*105**

**FALL 2006**

**Dr. John F. Cummins**

[jcummins@sunyorange.edu](mailto:jcummins@sunyorange.edu)

**Department of Science & Engineering**

## 35105 – General Physics I (Calc.)

3 lect., 3 lab., 4 cr.

A calculus-based course in general physics. The course covers the concepts of classical physics from introductory mechanics through thermodynamics. Topics include: kinematics, particle dynamics, energy and momentum conservation, gravity, statics, fluid statics and dynamics, laws of thermodynamics.

**Prerequisite: Calculus I (38205)**

### TEXT AND MATERIALS

This course will cover the topics presented in the chapters 1-8, 10 – 11 and 15 in the text: Raymond A. Serway and John W. Jewett, Principles of Physics, 3<sup>rd</sup> edition (New York: Harcourt, 2002), ISBN 0-03-039549-6. The student will also need a ruled laboratory notebook and a scientific calculator. Laboratory materials will be distributed throughout the course.

### RELATIONSHIP TO PROGRAMS

Physics 35105 is a university parallel course and is designed for the physical science or biological/health related science major. It is also an excellent course for someone planning on a career in science or mathematics education. This course requires calculus. There is a parallel non-calculus-based course entitled General Physics 35101-2. If in doubt about the proper physics course to take, consult with your advisor or with the department chair.

### Course Objectives

The student who successfully completes this course can:

- move fluently through the Systeme Internationale rationalized MKS units.
- explain the fundamentals of mechanics embodied in Newton's Laws.
- utilize vector representation and vector mathematics in the solution of problems.
- apply Newton's Laws to 2-dimensional systems of one or more particles.
- Solve problems in orbital mechanics involving gravitational forces.
- solve conservation of energy and momentum problems.
- express Newton physics in its rotational formulation.
- solve problems involving fluid static and dynamics.
- relate concepts of temperature and heat transfer to solution of problems in thermodynamics.

## Grading System

The grading for this course will be determined as follows

Exam # 1 --	13 %
Exam # 2 --	13 %
Exam # 3 --	13 %
Exam # 4 --	13 %
Cumulative Final	13%
Lab. Work --	20 %
Homework/Quizzes--	15 %

**MAKE-UP EXAMS DO NOT EXIST.**

For the most part the exams will consist of problem solving and/or derivations. THE CUMULATIVE SECTION FINAL EXAM WILL BE ALL MULTIPLE-CHOICE AND WILL BE AN OPEN NOTEBOOK EXAMINATION. It is very advisable to take decent and organized notes on the lecture material presented during the semester.

## INSTRUCTOR OFFICE HOURS

Instructor: Dr. John Cummins      Office: Harriman # 317 or Horton # 4  
Phone Ext: 341-4562  
jcummins@sunyorange.edu

I am fairly accessible and you should feel free to stop by any time. It is to your advantage to seek me out and to clear up difficulties as soon as possible. Without organized hard work, you will not do well in this course. On the other hand, if you work diligently you should have every hope of success.

## Attendance and Withdrawal

Perfect attendance is assumed in this course. Without perfect attendance and dedication to the homework one will not be successful in Physics. The student's grade will reflect any lack of attendance, simply because of the difficulty of the course. It is the **student's** responsibility to speak with the instructor and withdraw from the course if things are not going well. The instructor will not initiate such a withdrawal. An early consult with the instructor can save a great deal of later confusion.

## Support Services

Tutoring services are available in the Library. There is also tutoring in Physics available in the Mathematics Study Lounge in Ha 311. The Physical Science Study Lounge (Harriman 315) has proven a valuable resource for students assisting each other in reviewing the material and working together solving homework problems. This strategy, used correctly, can be of great assistance to you. Take advantage of it.

Tutoring services are also available in the learning resource center. Finally, if you have a documented disability and anticipate needing special accommodations in this course, please contact the Office of Disability Services located on the 3<sup>rd</sup> floor of the College Commons, (845) 341-4077, follow their guidelines regarding submitting documentation and bring your official Accommodation Notice to me as soon as possible.

## Library Resources

The following texts are on reserve in the library. They can be helpful if you take advantage of them.

**Arthur Beiser, Schaums Outline, Applied Physics.** The solved problems in this book are at a lower level than the problems in this course and in the text. However, they are good confidence builders and can be helpful in this regard. **Reserve # 180**

**Fredrick Bueche, Schaum's Outline of College Physics.** This book has excellent, clearly worked out problems related to every section of the text. **Reserve # 179**

**Alvin Halpern, Schaum's Outline – Beginning Physics I – Mechanics and Heat.** This text is similar to Reserve # 179, but contains only material relevant to 35101 and 35106 (General Physics I). It presents a good source of material to get warmed up on difficult concepts. **Reserve # 181**

**Serway and Faughn, College Physics and Faughn & Tigue, Instructors Manual With Solutions for Serway & Faughn.** These two texts should be used together. The complete solutions manual matches this non-calculus text and this resource should be helpful – especially if you have missed some of the material first time around. **Reserve # 183**

**Ralph McGrew, Principles of Physics: Instructors Manual With Solutions for Serway and Jewett (Vol.1).** The complete solutions manual matches our text and this resource will definitely be helpful to you – if used correctly. It should only be accessed after you have spent a good deal of time working on the problems. **Reserve # 240 (three copies)**

---

---

The lecture schedule on the following page should be viewed as tentative to the extent that some adjustments may seem advisable as the course progresses.

**NOTE:** Monday's class period (May 31, Memorial Day Holiday) will be made up on Friday, June 4.  
Monday's class period (July 5, Independence Day Observance) will be made up on the previous Friday, July 2. This is indicated in the block schedule which follows.

**ADDITIONAL NOTES:**

**Semester Lecture/Laboratory Schedule -- 35\*105 -- Fall 2006**

	<b>Monday</b>	<b>Monday/Wednesday</b>	<b>Wednesday</b>	<b>Lab.</b>
<b>Wk 1</b>	<b>Vectors</b> 1.1 - 1.11 #5,12,17,19,32, 40,41	<b>1-Dimen. Motion</b> 2.1 - 2.5 #3,7,10,11,12,15	<b>Free Fall</b> 2.6 #25,29,30,33,39,42	<b>LAB.</b> <b>Graphical</b> <b>Analysis</b>
<b>Wk 2</b>	<b>LABOR</b> <b>DAY</b> <b>WEEKEND</b>	<b>Graph. Analysis</b> 2.1 - 2.6 (cont.) #47,51,53,55,57	<b>Vectors</b> <b>Vel. &amp; Accel</b> 3.1 - 3.2 #1,3,5,7,8,9	<b>LAB.</b> <b>Galileo &amp;</b> <b>Free Fall</b>
<b>Wk 3</b>	<b>2-Dimen. Mtn.</b> <b>Projectiles 3.3</b> #13,15,16,17,19, 31	<b>Projectiles</b> 3.3 (cont.) #25,24,43,47,58	<b>Circular Mtn.</b> 3.4 #26,28,29,48	<b>LAB.</b> <b>Acceleration</b> <b>of Gravity</b>
<b>Wk 4</b>	<b>Relative Vel.</b> 3.4 #33,35,36,37,38	<b>Newton's Laws</b> 4.1 - 4.6 #1,3,5,7,9,20,22	<b>Applications</b> 4.7 #26,29,33,34,53	<b>LAB.</b> <b>Projectile</b> <b>Motion</b>
<b>Wk 5</b>	<b>Friction &amp; Newton's</b> <b>Laws</b> 5.1 #1,3,6,7,9,11	<b>Newton</b> <b>Circular Mtn.</b> 5.2 - 5.3 #13,15,16,17	<b>TEST # 1</b> <b>Chap 1-4</b>	<b>LAB.</b> <b>Newton's 2nd Law</b>
<b>Wk 6</b>	<b>Mtn. &amp; Resistance</b> 5.4 - 5.6 #19,21,22,25,39	<b>Grav. Field.</b> 5.7 #44,49,50,53	<b>Gravitation</b> 11.1 - 11.3 #1,3,5,11,13,16	<b>LAB.</b> <b>Centripetal</b> <b>Force</b>
<b>Wk 7</b>	<b>Monday Classes</b> <b>meet on Tues10/14</b> <b>Gravitation</b> <b>Recitation</b>	<b>Kepler &amp; Newton</b> 11.4 #17,20,21,39,51,52	<b>Scalar Product</b> 6.1 - 6.2 #1,2,3,5,7,11,13	<b>LAB.</b> <b>Atwood &amp;</b> <b>Gravity</b>
<b>Wk 8</b>	<b>Work/Energy</b> 6.3 #14,15,17,18,19,20	<b>Work-Ener. Theor.</b> 6.5 #21,23,25,27,29,31	<b>PotentialEnergy</b> 7.1 - 7.4 Ch 6 # 35,39 Ch 7 #3,4,5,7,9	<b>LAB.</b> <b>Energy Conser.</b> <b>Theorem</b> <b>(recitation)</b>

Wk 9	<b>Conserv. Forces</b> 7.5 - 7.7 #13,15,17,21,23	<b>Momentum</b> 8.1 - 8.3 Ch. 7 27,49 Ch 8 #5,7,9,13,14	<b>TEST # 2</b> Ch. 5,6,7 &11	<b>LAB.</b> <b>Momentum</b> <b>Conservation</b> <b>1-D</b>
Wk 10	<b>2-D Collisions</b> 8.3 - 8.5 #17,19,20,23,24,31	<b>Center of Mass</b> 8.6 - 8.8 Ch 8 #33,34,35, 36, 37	<b>Rotational Mtn.</b> <b>Kinematics</b> 10.1 - 10.3 #1,3,4,5,9	<b>LAB.</b> <b>Conservation of</b> <b>Momentum 2-d</b>
Wk 11	<b>Torque/Vectors</b> 10.4 - 10.5 #14,15,16,17,18	<b>Equilibrium</b> 10.6 - 10.7 #23,27,28,31,33	<b>Rotational Accel.</b> 10.7 & 10.11 #37,39,43,45	<b>LAB.</b> <b>Torque &amp;</b> <b>Angular Accel</b>
Wk 12	<b>Angular Mom.</b> 10.8 - 10.10 #47,49,50,67	<b>Fluid Statics</b> 15.1 - 15.4 #4,5,13,14,15,19	<b>TEST # 3</b> <b>Chap 8 -10</b>	<b>Lab. Fluid Statics</b>
Wk 13	<b>Fluid Dynamics</b> 15.5 - 15.8 #21,22,23,30,31,39	<b>Thanksgiving</b> <b>Holiday</b>	<b>Thanksgiving</b> <b>Holiday</b>	<b>Thanksgiving</b> <b>Holiday</b>
Wk 14	<b>Temp/Kinematics</b> 16.1 - 16.3 #7,9,11,13,17	<b>Temp/Motion</b> 16.4 - 16.5 #19,23,29,31,33	<b>Heat</b> 17.1 - 17.4 #Ch16 # 43,45 Ch17 #2,3,5,9,11	<b>Lab. Fluid</b> <b>Dynamics</b>
Wk 15	<b>First Law</b> 17.5 - 17.7 #17,21,18,25,27,37 45	<b>Carnot Cycle</b> 18.1 - 18.5 #3,5,9,11,13	<b>The Second Law</b> 18.6 - 18.9 #21,23,33,39	<b>LAB.</b> <b>Thermodynamics</b>
Wk 16	<b>Review &amp;</b> <b>Recitation</b>	<b>Final Exam: Chap</b> <b>15 - 18 +</b> <b>Cumulative.</b> <b>DATE/TIME TBA</b>		