

# PHYS 1400

## PHYSICAL SCIENCE

### SPRING 2009

Lecture 1:00pm–1:50pm MWF LSC 168

23602 LAB A 2:40pm–3:55pm T

23603 LAB B 4:05pm–5:20pm T

[http://faculty.uca.edu/~saustin/1400/1400\\_sp09.html](http://faculty.uca.edu/~saustin/1400/1400_sp09.html)

## Instructor

**Scott Austin**

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Office hours: M T W Th 12pm–1pm, MWF 4pm–5pm

## Course Description

Principles of elementary physics, chemistry, and astronomy for the non–science major. Includes laboratory.

## UCA General Education Objectives for Natural Sciences

This course is part of the general education program of study and satisfies the four–hour physical science requirement.

The goal of the natural sciences is to better understand nature. The natural sciences systematically studies natural phenomena. Understanding of the universe is accomplished through the scientific method which is a cycle of observation, hypothesizing, testing, and hypothesis revision which reveals the physical principles upon which the universe is governed.

Objectives for students completing the Natural Sciences requirements are:

- to understand what the real of science is, and why science is important to their lives;
- to understand current principles and theories used to explain natural phenomena and to understand the role of theories in science;
- to do science as a process by conducting systematic observations, formulating and testing hypotheses, recognizing sources of error and uncertainty in experimental methods, and disseminating results;
- to be able to understand science related topics and policies.

## Course Format

### Required Equipment

- Text book (Krauskopf & Beiser, “The Physical Universe” 12th edition)
- TurningPoint ResponseCard RF
- Calculator
- Composition Lab Notebook (Quad. Ruled 5 to 1”, 9.75”X7.5”)

## Classroom Activities

Assigned reading must be done before coming to class. Class time will be spent on presentations, demonstrations, discussions, and activities related to the assigned subject matter. Many of the in-class activities will involve the use of the responder (“clicker”) that comes with the textbook. Participation in class will count toward your course grade.

## Laboratory Exercises

Lab work will be done during the Tuesday lab block. You are responsible for printing out the lab handouts from the class website. You must have a lab notebook. You must use a hard-bound book with quadrille-ruled paper and sewn-in pages. These are inexpensive and readily available at the bookstores and office supply stores. You must have a fresh notebook. You may not use notebooks from previous semesters, unless the pages that have been written on have been removed. You should always bring the notebook to lab, along with writing utensils, a calculator, and your textbook. You should record all data, calculations, and answers to questions in your lab notebook. Lab participation will be recorded and will count for 30% of your lab grade. Your understanding of the lab assignments will be assessed with weekly quizzes (which will count for 70% of your lab grade) and on the exams. You will be allowed to use your lab notebook when taking your quiz. A quiz may have some combination of multiple choice and true or false all referring exclusively to the lab. If you did not attend lab then you will not receive credit on the lab quiz. Three unexcused lab absences will result in an automatic grade of F for the semester.

## Exams

Three exams are scheduled during the semester. These tests will consist of multiple choice questions covering the classroom activities, readings, and lab exercises.

## Final Exam

The final exam is comprehensive. A failing grade on the final exam will result in an automatic failing grade for the entire course. The final will consist of multiple choice questions covering the classroom activities, readings, and lab exercises.

## Extra-credit

Extra-credit does not come in the form of extra-assignments or points. Instead, extra-credit consideration can be earned by demonstrating that you are academically engaged in this course (i.e. asking meaningful questions and seeking help in class, in lab, during office hours, and through e-mail). Extra-credit consideration will only apply to those students who just miss the cut-off for the next higher grade in the course by a couple percentage points.

## Grading and Grades

- If  $(\text{Final Exam Grade}) > (\text{Exam Average})$  and  $(\text{Final Exam Grade}) > F$ ,  
then  $\text{Course Grade} = 10\% \text{Class} + 30\% \text{Lab} + 60\% \text{Final Exam}$
- If  $(\text{Final Exam Grade}) < (\text{Exam Average})$  and  $(\text{Final Exam Grade}) > F$ ,  
then  $\text{Course Grade} = 10\% \text{Class} + 30\% \text{Lab} + 30\% \text{Exams} + 30\% \text{Final Exam}$
- If  $\text{Final Exam Grade} = F$  and/or three or more lab absences,  
then  $\text{Course Grade} = F$

## Starting Grade Scale

$90\% \leq A \leq 100\%$

$75\% \leq B < 90\%$

$60\% \leq C < 75\%$

$50\% \leq D < 60\%$

$0\% \leq F < 50\%$

## Phones and PDAs

**Sending or receiving messages with phones or other devices during class or lab will result in the loss of points equivalent to one lab quiz for each infraction.**

**Using phones as calculators is prohibited.**

**Having a phone on or visible during an exam or quiz will result in an automatic F for the exam or quiz.**

## Absences

All labs, quizzes, and exams must be done during the scheduled times.

Consideration will be given for the following at the convenience of the instructor:

- Any student who is required to participate in off-campus, university-sponsored activities such as field trips, musical performances, judging teams, intercollegiate athletic events, etc. must obtain a letter from the faculty or staff member supervising the off-campus activity. The letter must contain specific information concerning the activity and date, be signed by the supervising faculty or staff member, and be submitted by the student to me at least one week in advance.
- Students that must miss a class because of illness, personal crises, mandated court appearances, parental responsibilities, and the like are required to submit a written explanation of the absence at least one week in advance. For emergency situations, students are required to call or e-mail me immediately followed by a written explanation.
- If one cannot come to class because of inclement weather one must call or e-mail me immediately.
- Students who attempt to gain advantage through abuse of this policy (e.g., by providing an instructor with false information) will receive disciplinary action and will fail this course.

## Academic Misconduct

Academic misconduct include cheating, falsification, multiple submission, plagiarism, abuse of academic materials, and complicity or misconduct in research; the definition of academic misconduct is stated in the Student Handbook. Any student guilty of an act of academic misconduct will be subjected to one or more of the following penalties as outlined in the Student Handbook: 1. The students' grade in the course or on the examination or assignment affected by the misconduct may be reduced to an extent, including reduction to failure. 2. The student may be placed on probation or suspended from the university for a specific period of time. 3. The student may be expelled from the university. Expect to receive the maximum penalty for any academic misconduct.

## Misc Policies

All other policies not explicitly covered in the syllabus can be found in the Student Handbook. For example, academic policies in general can be found beginning on page 26 and the sexual harassment policy can be found on page 93.

## Americans with Disabilities Act

UCA adheres to the requirements of the Americans with Disabilities Act. If you need accommodation under this Act contact the UCA Office of Disability Services at 450-3135.

## Schedule Spring 2009

	Month	Day	Location	Subject/Event	Read Chapter-Sections
F	Jan	16	LSC 168	Syllabus, Clicker registration	1
M	Jan	19		MLK No class	
T	Jan	20	LSC 161	<b>LAB 01:</b> Using Numbers	1
W	Jan	21	LSC 168	<i>How Scientists Study Nature and The Solar System</i>	1
F	Jan	23	LSC 168	<i>Universal Gravitation and How Many of What</i>	1
M	Jan	26	LSC 168	<i>Describing Motion</i>	2
T	Jan	27	LSC 161	<b>LAB 02:</b> Galileo's Inclined Plane	2
W	Jan	28	LSC 168	<b>Lab Quiz 01,</b> <i>Acceleration of Gravity</i>	2
F	Jan	30	LSC 168	<i>Force and Motion</i>	2
M	Feb	2	LSC 168	<i>Gravitation</i>	2
T	Feb	3	LSC161	<b>LAB 03:</b> Human Horsepower	2, 3
W	Feb	4	LSC 168	<b>Lab Quiz 02,</b> <i>Work</i>	3
F	Feb	6	LSC 168	<i>Energy</i>	3
M	Feb	9	LSC 168	<i>Momentum</i>	3
T	Feb	10	LSC161	<b>LAB 04:</b> Momentum and Energy	3
W	Feb	11	LSC 168	<b>Lab Quiz 03,</b> <i>Energy and Civilization</i>	3
F	Feb	13	LSC 168	<b>EXAM 1</b> (Chapters 1,2,3)	1, 2, 3
M	Feb	16	LSC 168	<i>Temperature and Heat</i>	4
T	Feb	17	LSC161	<b>LAB 05:</b> Archimedes Principle	4
W	Feb	18	LSC 168	<b>Lab Quiz 04,</b> <i>Fluids</i>	4
F	Feb	20	LSC 168	<i>Kinetic Theory of Matter</i>	4

	Month	Day	Location	Subject/Event	Read Chapter-Sections
M	Feb	23	LSC 168	<i>Changes of State</i>	4
T	Feb	24	LSC 174	<b>LAB 06:</b> Radiant Heat	4
W	Feb	25	LSC 168	<b>Lab Quiz 05,</b> <i>Energy Transformations</i>	4
F	Feb	27	LSC 168	<i>Electric Charge</i>	5
M	Mar	2	LSC 168	<i>Electricity and Matter</i>	5
T	Mar	3	LSC 174	<b>LAB 07:</b> DC Circuits	5
W	Mar	4	LSC 168	<b>Lab Quiz 06,</b> <i>Electric Current</i>	5
F	Mar	6	LSC 168	<i>Magnetism</i>	5
M	Mar	9	LSC 168	<i>Using Magnetism</i>	5
T	Mar	10	LSC 174	<b>LAB 08:</b> Magnetic Induction	5
W	Mar	11	LSC 168	<b>Lab Quiz 07,</b> <i>Using Magnetism</i>	5
F	Mar	13	LSC 168	<b>EXAM 2</b> (Chapters 4, 5)	4, 5
M	Mar	16	LSC 168	<i>Wave Motion</i>	6
T	Mar	17	LSC161	<b>LAB 09:</b> Speed of Sound	6
W	Mar	18	LSC 168	<b>Lab Quiz 08,</b> <i>Sound Waves</i>	6
F	Mar	20	LSC 168	<i>Electromagnetic Waves</i>	6
M	Mar	30	LSC 168	<i>Wave Behavior</i>	6
T	Mar	31	LSC 161	<b>LAB 10:</b> Reflection and Refraction	6
W	Apr	1	LSC 168	<b>Lab Quiz 9,</b> <i>Wave Behavior</i>	6
F	Apr	3	LSC 168	<i>Atom and Nucleus</i>	7
M	Apr	6	LSC 168	<i>Radioactivity</i>	7
T	Apr	7	LSC 174	<b>LAB 11:</b> Radioactive Decay	7

	Month	Day	Location	Subject/Event	Read Chapter-Sections
W	Apr	8	LSC 168	<b>Lab Quiz 10,</b> <i>Nuclear Energy</i>	7
F	Apr	10	LSC 168	<i>Fission and Fusion</i>	7
M	Apr	13	LSC 168	<i>Elementary Particles</i>	7
T	Apr	14	LSC 174	<b>LAB 12:</b> Spectroscopy	8
W	Apr	15	LSC 168	<b>Lab Quiz 11,</b> <i>Quantum Theory of Light</i>	8
F	Apr	17		<b>EXAM 3</b> (Chapters 6, 7)	6, 7
M	Apr	20	LSC 168	<i>Matter Waves</i>	8
T	Apr	21		<b>LAB 13:</b> Size of a Molecule	8
W	Apr	22	LSC 168	<i>The Hydrogen Atom</i>	8
F	Apr	24	LSC 168	<i>Quantum Theory of the Atom</i>	8
M	Apr	27	LSC 168	<i>Elements and Compounds</i>	9
T	Apr	28		No lab	
W	Apr	29	LSC 168	<i>Atomic Structure and Chemical Bonds</i>	9
F	May	1		No Class	
M	May	4	LSC 168	<b>FINAL EXAM (11am-1pm)</b>	