Physics 5B **General Information** **Winter 2009**

Instructor:	Howard Haber
Office:	ISB, Room 326
Phone Number:	459-4228
Office Hours:	Mondays and Thursdays, 3–4 pm
E-mail:	haber@scipp.ucsc.edu

COURSE WEB PAGE:

`http://scipp.ucsc.edu/~haber/ph5B/index.html`

CLASS HOURS:

Lectures: Mondays, Wednesdays and Fridays 9:30–10:40 am, Thimann Lecture Hall 3

DISCUSSION SECTIONS, HONORS SECTION AND MSI TUTORING:

TA Discussion Sections in ISB, Room 235:

Mondays 12:10–1:40 pm	Glenn Gray
Tuesdays 1:45–3:15 pm	Ian Carbone
Tuesdays 6:30–8:00 pm	Auditya Sharma

Physics 5J Honors Section in ISB, Room 231:

Thursdays 2:00–3:45 pm	David Smith

In addition to TA support, additional class learning support is available through Modified Supplemental Instruction (MSI). The MSI Drop-In tutoring will be conducted by Taylor Griffin (E-mail: tgriffin@ucsc.edu) at times to be announced in class and on the course website.

REQUIRED TEXTBOOK:

Physics for Scientists & Engineers with Modern Physics, 4th edition, by Douglas C. Giancoli

PREREQUISITES:

Prerequisite math courses: Mathematics 19A or 20A
Co-requisite math courses: Mathematics 19B or 20B
Prerequisite physics courses: 5A/L

It is assumed that you are familiar with the material in Chapters 1–12 of Giancoli's textbook.

LABORATORY SECTION TEACHING ASSISTANTS:

TA:	Ian Carbone
Office:	ISB, Room 262
Phone Number:	459-5010
E-mail:	icarbone@ucsc.edu

TA:	Laura Daniel
Office:	Nat Sci II, Room 308
Phone Number:	459-4588
E-mail:	ldaniel@ucsc.edu

TA:	Glenn Gray
Office:	ISB, Room 262
Phone Number:	459-5010
E-mail:	ggray@ucsc.edu

TA:	Auditya Sharma
Office:	ISB, Room 288
Phone Number:	459-4106
E-mail:	sharma@physics.ucsc.edu

PHYSICS 5J: INTRODUCTION TO PHYSICS II—HONORS SECTION:

Instructor:	David Smith
Office:	Nat. Sci. II, Room 321
Phone Number:	459-2183
Office Hours:	Tuesdays 2–3 pm and Wednesdays 10:30–11:30 am
E-mail:	dsmith@scipp.ucsc.edu

Brief Course Outline for Physics 5B

Topic	Reading
1. Fluids	Giancoli, Chapter 13
2. Oscillations	Giancoli, Chapter 14
3. Wave Motion	Giancoli, Chapter 15
4. Sound	Giancoli, Chapter 16
5. Light: Reflection and Refraction	Giancoli, Chapter 32
6. Lenses and Optical Instruments	Giancoli, Chapter 33
7. The Wave Nature of Light; Interference	Giancoli, Chapter 34
8. Diffraction and Polarization	Giancoli, Chapter 35

Important Class Information

Course Grading and Requirements

5% Class participation (clickers)
20% Weekly Homework (10 problem sets)
20% First Midterm Exam (Friday, January 30, 2009, in class)
20% Second Midterm Exam (Friday, February 27, 2009, in class)
35% Final Exam (Thursday, March 19, 2009, 8:00–11:00 am)

Lectures

A detailed lecture schedule is included in this packet. Lectures will focus on developing core ideas and intuition for the topics studied and will include in-class demonstrations and interactive components. These are designed to be a supplement for the reading, not a substitute. I strongly urge you to do the assigned readings in the textbook before each lecture. Even if you miss an assigned reading, attendance at the lecture is strongly recommended (although don't forget to do the reading afterwards!).

Exams

The two midterm exams and final exams will be held in the same classroom as the lectures. Each midterm will be a one hour and ten minute exam. The final exam will be three hours long and cover the complete course material. You must take the midterm and final exams to pass the course. You will be permitted to consult a page of personal notes during the exams.

Student response system (the "clickers")

The lectures will employ the i>Clickers, which are available for purchase at the Bay Tree Bookstore. Clickers allow you to respond to the questions posed in class. A small component (5%) of your grade will be contingent on you taking part in this. Moreover, it is fun, so please participate! If you have nor registered your clicker for Physics 5B, please do so now.

Homework assignments

Solving problems is an integral and essential part of learning physics. Weekly homework assignments will be handed out each Wednesday and are due at the beginning of class on the Wednesday of the following week. (Exception: the last homework set will be due on the last day of class, which is a Monday.) The homework problem sets are NOT optional. You are encouraged to discuss the class material and homework problems with your classmates and to work in groups, but all submitted problems should represent your own work and understanding. In order that homework can be graded efficiently and returned quickly, late homework WILL NOT be accepted (except for special circumstances, if you have made arrangements with me PRIOR to the due date). However, note that the lowest homework set grade will be dropped in evaluating your course grade. Your homework sets will be graded based on the clarity of your method of solution as well as on your final answers.

Homework solutions will be posted on the class website, usually the same evening after the homework sets are due. Graded homework will be returned on shelves in the hallway next to Thimann 111D.

Discussion sections and review sessions

You have a choice of four discussion sections hosted by the lab TAs. The TAs do not have separate office hours, so if you wish to consult with them, you must do so in one of the discussion sections. Choose the one that best suits your schedule. You may choose to attend a different section (or more than one section) in a given week if needed. Attendance is voluntary, but very strongly encouraged. The discussion sections will clarify some of the lecture material, but its main focus is on problem solving strategies and techniques, for which there will be limited coverage in class.

Review sessions for the two midterm and final exams will be conducted by one of the TAs, and will take place one or two days prior to the exams.

Physics 5J: The Honors Section

David Smith is the instructor for Physics 5J, which is an *optional* course available for Physics 5B students. Physics 5J is a separate 2 unit course running in parallel with Physics 5B. This course will cover more advanced treatments of some of the Physics 5B course material, along with some special topics connected to the physics of fluids, waves and optics. The Honors Section includes additional assignments beyond those required for Physics 5B.

Lecture and Exam Schedule for Physics 5B (page 1)

Date	Textbook readings	HW due
Wed Jan 7	13-1 , 13-2 , 13-3	
Fri Jan 9	13-4 , 13-5 , 13-6	
Mon Jan 12	13-7 , 13-8 , 13-9	
Wed Jan 14	13-10 , 13-11 , 13-12 , 13-13	#1 due
Fri Jan 16	14-1 , 14-2	
Mon Jan 19	MARTIN LUTHER KING JR. DAY (no class)	
Wed Jan 21	14-3 , 14-4 , 14-5	#2 due
Fri Jan 23	14-6 , 14-7 , 14-8	
Mon Jan 26	15-1 , 15-2	
Wed Jan 28	15-3 , 15-4 , 15-5	#3 due
Fri Jan 30	MIDTERM EXAM I (in-class exam)	
Mon Feb 2	15-6 , 15-7 , 15-8 , 15-9	
Wed Feb 4	16-1 , 16-2 , 16-3	#4 due
Fri Feb 6	16-4 , 16-5	
Mon Feb 9	16-6 , 16-7	
Wed Feb 11	16-8 , 32-1 , 32-2	#5 due
Fri Feb 13	32-3 , 32-4	
Mon Feb 16	PRESIDENTS' DAY (no class)	
Wed Feb 18	32-5 , 32-6 , 32-7 , 32-8	#6 due
Fri Feb 20	33-1 , 33-2	
Mon Feb 23	33-3 , 33-4 , 33-5	
Wed Feb 25	33-6 , 33-7 , 33-8	#7 due
Fri Feb 27	MIDTERM EXAM II (in-class exam)	

Lecture and Exam Schedule for Physics 5B (page 2)

Date	Textbook readings	HW due
Mon Mar 2	34-1 , 34-2 , 34-3	
Wed Mar 4	34-4 , 34-5	#8 due
Fri Mar 6	35-1 , 35-2	
Mon Mar 9	35-3 , 35-4 , 35-5 , 35-6	
Wed Mar 11	35-7 , 35-8 , 35-9	#9 due
Fri Mar 13	35-10 , 35-11 , 35-13	
Mon Mar 16	Course Review	#10 due
Thu Mar 19	FINAL EXAM	

Notes:

1. All textbook readings are from *Physics for Scientists & Engineers with Modern Physics*, 4th edition, by Douglas C. Giancoli. In the lecture schedule above, 13-1 means Chapter 13, section 1, etc. You are strongly advised to read the assigned sections for a given day *prior* to the class lecture.

2. If you have purchased the course textbook in two separate volumes, please note that Chapters 13–16 appear in Volume I, and Chapters 32–35 appear in Volume II.

3. All homework (HW) is due on a Wednesday (exception: HW #10 is due on a Monday, the last day of class). Odd numbered homework sets (#1, 3, 5, 7, 9) will cover material from the three lectures prior to the due date. Even numbered homework sets (#2, 4, 6, 8, 10) will cover material from the two lectures prior to the due date.

4. There will be two midterm exams. The first midterm will take place on Friday January 30, and the second midterm will take place on Friday February 27. Both midterm exams will be held in Thimann Lecture Hall 3 during the usual class lecture time. No class lecture will be given on those two days.

5. The final exam will be held on Thursday March 19, 2009 in Thimann Lecture Hall 3 (the location of the course lectures) from 8:00–11:00 am.

Oscillations, Fluids, Waves and Optics

Laboratory Instructor:	George Brown
Office:	Thimann, Room 111D
Phone Number:	459-2327
E-mail:	gsbrown@ucsc.edu

PHYSICS 5M LABORATORY WEB PAGE:

`www.ic.ucsc.edu/~gsbrown/ldlabs/physics5m.html`

REQUIRED LABORATORY MANUAL (for Physics 5M):

Fluids, Waves and Optics, the Physics 5M Laboratory Manual, by George Brown

Laboratory sections

Physics 5M is a separately listed course but an essential part of Physics 5B. The laboratory sections take place in Thimann 115. You must be enrolled in one of the eight scheduled sections:

5M-01	Tuesdays 8:30–11:30 am	Auditya Sharma
5M-02	Tuesdays 12:00–3:00 pm	Auditya Sharma
5M-03	Tuesdays 3:30–6:30 pm	Ian Carbone
5M-04	Tuesdays 7–10 pm	Glenn Gray
5M-05	Wednesdays 3:30–6:30 pm	Laura Daniel
5M-06	Wednesdays 7–10 pm	Ian Carbone
5M-07	CANCELED	
5M-08	Thursdays 12:00–3:00 pm	Laura Daniel
5M-09	Thursdays 7–10 pm	Glenn Gray

The Laboratory sections begin operations on Tuesday January 13.

Policy for missed labs

You are required to complete every laboratory. If you know well in advance that you will not be able to attend a lab, then you must get the written agreement of your regular TA and the TA of the section that you want to attend before you show up to that section. Please note that you will not be admitted to a lab section that already has 22 students enrolled, which is a strict upper limit.

If you miss one laboratory without approval in advance, your final grade will be marked down by one full letter. If you miss two labs, you will not pass the course. Because of logistical constraints, there will be no makeup labs.

Physics 5M Laboratory schedule

Lab weeks	Laboratory topics
Jan 6–8	no labs scheduled this week
Jan 13–15	Fluids (Archimedes principle, Bernoulli's Principle)
Jan 20–22	Harmonic Oscillator (Transient and forced oscillator response)
Jan 27–29	Mechanical Waves (Pulses, traveling waves, standing waves, boundary conditions)
Feb 3–5	Standing Waves on a Guitar String (Harmonics)
Feb 10–12	The Resonance Tube (Physics of the open and closed organ pipe)
Feb 17–19	Geometric Optics (Index of refraction; single lens instruments)
Feb 24–26	Compound Optical Systems (Newtonian telescope; microscope)
March 3–5	Interference Phenomena (Single slit, double slit, grating)
March 10–12	Polarization of Light