PHYS 240 **Course Information**

This course will cover the basic concepts of fluids, wave motion, optics, thermodynamics, along with some selected topics from modern physics. The objective is to learn fundamental physics in these different areas through lectures and class discussion combined with laboratory work.

Instructor: Dr. Zhigang Chen
Office: Thornton Hall 526
Office hours: TBA

Meeting Time and Place:
TTH 0935-1050 TH 327

Textbook:
"*Physics: The Nature of Things*" by S. Lea and J. Burke.
We will be covering the materials in Chap. 13-22, and some selected topics from Chap. 33-36, so you need both volumes of the text book.

Prerequisites:
PHYS 220 and MATH 227, both with grades of C or better; MATH 228 and PHYS 230 recommended. Must be taken concurrently with PHYS 242.
(Completion of the Lab 242 is required for completion of the Lecture 240).

Homework:
Homework is an important part of learning. Homework problems will be assigned weekly, and will be due each week before the new assignment. Normally, you will get assignments on Tuesday and turn in on next Tuesday before the class unless changes are announced in lecture. *You must turn in your homework yourself before lecture. No late homework is accepted.* In addition to the problems assigned, it is strongly recommended that you do at least one or two other problems for each chapter section covered. There will be help sections intended to provide help in homework problem-solving and to answer related questions.

Exams:
There will be two in-class mid-term exams, and a comprehensive final exam. In general, no make-up for the exams and no scores are dropped. Exams will be closed-book, mainly at the level of homework problems.

Grading:

Homework	20%
Exam 1	20%
Exam 2	20%
Final Exam	40%

Note: *To receive a passing grade in this class, you must complete Phys 242, must attempt homework problems in each assignment and attend the three exams. A minimum score of 60% overall is required for a grade of C or better. In-class exercise and class attendance will be considered for the final grade.*

Please feel free to talk to me if you have questions about any aspect of the course.

PHYS 240 **Class Schedule**

Date	Topic	Reading	Problems*
Fluid Mechanics and Wave Motion			
T 1/26	Intro to class, Intro to fluids		
Th 1/28	Pascal's Principle	Chapter 13 § 1-3	
T 2/2	Archimedes Principle	Chapter 13 § 4	Ch13-20,33,47,65,85,88
Th 2/4	Fluid dynamics	Chapter 13 § 5-6	
T 2/9	Mechanical waves	Chapter 15 § 1-3	Ch15-24,32,34,53,57,58
Th 2/11	Wave equations & Superposition	Chapter 15 § 3-4	
T 2/16	Sound waves	Chapter 16 § 1	Ch16-21,26,32,43,56,60
Th 2/18	Light waves	Chapter 16 § 2 & 3	
T 2/23	The Doppler effect	Chapter 16 § 4	
(T 3/2	**First Mid-term Exam**	Chapters 13-16	
Geometric and Wave Optics			
Th 2/25	Law of reflection and refraction	Chapter 16 § 5	
T 3/2	First Mid-term Exam	Chapters 13-16	
Th 3/4	Mirrors & optical fiber	Chapter 18 § 1-2	Ch16-65,67,74, Ch18-19,29,30
T 3/9	Spherical refracting surfaces	Chapter 18 § 2-3	
Th 3/11	Thin Lenses	Chapter 18 § 2-3	
T 3/16	Ray Diagrams, Magnification	Chapter 18 § 4	Ch18-41,43,50,55,67,77
Th 3/18	Optical instruments	Chapter 18 § 5	
T 3/23	Interference & Interferometer	Chapter 17 § 1-2	Ch17- 1,3,22,33, 45, 50
Th 3/25	Diffraction & Gratings	Chapter 17 § 3-4	
T 3/30, Th4/1	Spring recess		
T 4/6, Th 4/8	Furlough days		Ch17-44,48; Ch33-5,23,43,45
T 4/13	**Second Mid-term Exam**	Chapters 16-18)	

Thermodynamics and Modern Physics

Th	4/15	Temperature, The ideal gas law	Chapter 19 § 1 & 2	
T	4/20	Internal Energy, Equipartition	Chapter 19 § 7	Ch19-23,27,31,33,40,47
Th	4/22	The first law of thermodynamics	Chapter 19 § 3	
T	4/27	The P-V diagram, adibatic processes	Chapter 19 § 4-6	Ch19-45,52,55,58, Ch20-14,30
Th	4/29	Real gases & Change of phase,	Chapter 20 § 1-3	
T	5/4	Calorimetry and Heat transfer	Chapter 20 § 4 & 5, Chap 21	Ch20-36,38, Ch21-1,23,27,37
Th	5/4	The second law/ Carnot engine	Chapter 22 § 1-3	
T	5/11	Entropy	Chapter 22 § 4-5	Ch22-5, 20, 27, 38, 41,43,
Th	5/13	Modern Physics	Chapter 35	Ch22-8,14; ch35-1,15,67

Final Exam Thursday May 20 8:00-10:30

* These are tentative homework problems. Changes will be announced in lecture before each assignment.

Plagiarism – Representing work done by others as your own work is expressly forbidden. See the Physics and Astronomy Dept. Plagiarism policy on http://www.physics.sfsu.edu under *Department Policies*
Withdrawals – Withdrawals are permitted only for "serious and compelling reasons". If you withdraw from a lecture course associated with a lab, you will usually have to withdraw from the lab as well. See the Physics and Astronomy Dept. Withdrawal policy on http://www.physics.sfsu.edu under *Department Policies*

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu)