PHYS 0174: Physics for Science and Engineering 1

(Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course website and announced in class)

Instructors:

Prof. Yousef Faraj (Section 2)
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Office Hours:

Dr. Lin Fang (Section 1 & 3)
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Office Hours: Wednesdays 13:00 -15:30; Fridays 13:00 - 15:00; for meetings at other times please make appointments in advance.

Class Times:

PHYS 0174 Physics for Science and Engineering 1		4 credits		
SCU Course ID	Sec	Time	Location	Instructor
312008040	1	Tues. 13:50-11:55	Zone 3-103	Lin Fang
		Wed. 15:40-17:30	Zone 3-103	Lin Fang
	2	Wed. 10:15-11:55	Zone 3-103	Yousef Faraj
		Thur.13:50-15:30	Zone 3-103	Yousef Faraj
	3	Tues.10:15-11:55	Zone 3-103	Lin Fang
		Fri.10:15-11:55	Zone 3-103	Lin Fang

Teaching Assistants:

Zhao Jinyu (for Dr. Lin Fang), a senior student in Physics College, SCU.
Cell: 15756217545

(Prof. Yousef Faraj)
Cell:

Catalog Description:

4 Credits; As the first part of a two-semester introduction to general physics, this course introduces students to the basic principles of classical Newtonian mechanics and gravitation.

Topics covered include motion in 1-, 2-, and 3-dimensions, Newton's Laws, work and energy, rotational motion, momentum, gravitation, fluid mechanics, harmonic motion and thermodynamics.

Required Text:

Principles of Physics, 10th Edition, Halliday, Resnick, Walker. International Student Version.

Course Objective:

The goal of this course is to give students an introductory overview of the subject of physics, starting from the description of the fundamental quantities such as time, distance, and mass, and to progress through the description of nature using Newtonian mechanics and its application to gravity. Strong mathematical skills are needed to test the understanding of the models and theories that the students will be introduced to.As the semester progresses the students are required to:

1. Be familiar with the basic concepts and methods physicists use to analyze the world. Interpret the different units and scales of measurable quantities.
2. Convert units of mechanical quantities.
3. Make use vectors to describe and analyze motion.
4. Describe and analyze motion with constant acceleration Apply differential calculus to the analysis of motion. Analyze simple situations and explain them to other people.
5. Make use of motion diagrams. Acquire a thorough understanding of the concept of force Apply newton's laws to simple physical systems.
6. Apply the principle of conservation of energy to mechanical systems. Interrelate the concepts of physical work, forces, potential, and kinetic energy Apply the principle of conservation of linear momentum.
7. Apply concepts such as torque and angular momentum to rotation of rigid bodies Apply newton's law of gravitation to planetary motion.
8. Assimilate new material and apply it to analyze different situations.

Course Outline:

Part 1:

Measurement (Ch. 1)
Motion along a Straight Line (Ch. 2)
Vectors (Ch. 3)
Motion in Two and Three Dimensions (Ch. 4)
Force and Motion (Ch. 5-6)

Part 2:

Energy and Work (Ch. 7-8)
Linear Momentum (Ch. 9)
Rotation (Ch. 10)
Angular Momentum (Ch. 11)

Equilibrium and Elasticity (Ch. 12)

Part 3:

Gravitation (Ch. 13)
Fluids (Ch. 14)
Oscillations (Ch. 15)
Waves (Ch. 16-17)
Thermodynamics (Ch. 18-20)

Examination Schedule:

Midterm Exam on the early May;
Final Exam on the late June.

Course Grading:

Schoolwork: 30%
Midterm Exam: 30%
Final Exam: 40%

Grading Scale:

A 10-point scale will be used as a baseline for final grades (A, A- > 90, 89 > B+, B, B- >80, etc.). An additional curve may be applied, as determined by the overall final grade distribution of the class. Grades of A-, B+, B-, etc. will be determined at the instructor's discretion.