COLLEGE OF ENGINEERING AND NATURAL SCIENCES

DEPARTMENT OF PHYSICS AND ASTRONOMY

SPRING SEMESTER, 2008

Course: Physics 263: University Physics III

Meeting Time: MWF 10:20 - 11:10

Credit Hours: 3

Instructor: Dr. Randy Dillingham

Office: Physical Science (building #19), room 217. Phone: 523-2959. email: randy.dillingham@nau.edu

Office Hours: 9:20 - 10:20 M, W and 8:35 - 9:35 T

Course Prerequisites: Physics 262 or Physics 112 and 112L, and Math 137.

Course Description: This course is the third semester of the three-semester, calculus-based sequence for scientists and engineers. The topics covered in this semester include wave motion and sound, electromagnetic waves and optics, special relativity, quantum mechanics, and atomic physics.

Course Objectives: To develop an understanding of some of the fundamental principles of waves, optics, and modern physics and to develop the tools to apply these principles to particular problems of scientific interest.

Course Structure: Physics 263 is a lecture-based course that meets three hours per week to discuss the fundamental physical principles outlined above, and to develop the analytical tools to apply these principles to various scientific problems. Homework problems will be assigned to explore these principles and to provide practice in applying them.

Textbook: *Physics for Scientists and Engineers with Modern Physics* by R. A. Serway and J. W. Jewett, Jr. (6th edition).

Course Outline:

Topics Covered	Text Reference
Oscillatory Motion	Ch. 15
Waves Motion	Ch. 16
Sound Waves	Ch. 17
Superposition and Standing Waves	Ch. 18
Electromagnetic Waves	Ch. 34
The Nature of Light and Geometric Optics	Ch. 35
Image Formation	Ch. 36

Interference of Light Waves	Ch. 37
Diffraction Patterns and Polarization	Ch. 38
Relativity	Ch. 39
Introduction to Quantum Physics	Ch. 40
Quantum Mechanics	Ch. 41
Atomic Physics	Ch. 42

Evaluation:

Exams (two)	200 points
Homework	100
Research Paper	25
Comprehensive Final	125
	450 total

Grading:

90% and above	A
80 - 89%	B
68 - 79%	C
56 - 67%	D
55% and below	F

Exams: As noted above, there will be two, in-class, one-hour exams. The exams will consist of multiple choice, fill in the blank, and 4 to 5 intermediate level, mathematically oriented problems. The final exam will be comprehensive but will emphasize the last third of the course. Note that the final exam is scheduled for 10:00 am on Monday, May 5.

Homework: Doing well on each homework assignment is essential in gaining a complete understanding of the concepts and methods developed in this course. Each assignment will consist of approximately 8 to 10 problems. Two or three problems will be graded from each set on the basis of 5 points per problem. To get this credit, you must show, in detail, how your answer was obtained. The due date for each assignment will be announced well ahead of time and homework should be turned in at the beginning of the class period on those dates. It is permissible to work on homework with other people or to receive assistance. Make sure, however, that you are doing your part in the thought process of problem solving. Simply copying homework will only prepare you for failure on the exams. We will have ample opportunity for class discussion concerning the homework problems once the assignment has been turned in.

Research Paper: Toward the middle of the semester, each student will select a topic of interest that is relevant to our study of wave motion, optics and modern physics. I will provide a list of possible topics, if you need suggestions. Please see me in advance for approval of your topic prior to beginning your research. You should submit a four to five page summary (typed, double-spaced, with figures and at least three references) of your topic. The due date for the paper is April 18, 2008.

Course Policy: It is the responsibility of the student to attend the class on a regular basis. A student will be allowed to make-up an exam or homework assignment only with a legitimate excuse (medical or prior institutional excuse). I have no tolerance for any form of cheating. See the student handbook for the official policy on plagiarism and cheating.

Departmental and University Policies: Please read the policies posted at
http://www.physics.nau.edu/COURSES/POLICY/policy.html