Independent Study – Timothy Coons
Fall 2005
PHYC497

A. Title Calculus Supplement for Introduction to Waves, Electricity & Magnetism, and Optics (Physics 252)

B. Objectives

As a result of this independent study program, the student should be able to: (1) describe how differential calculus applies to introductory topics in oscillatory motion and traveling waves, electricity and magnetism, and optics; and (2) work through problems in a standard first-year university text on waves, E&M, and optics that require differential calculus for their solution. The calculus treatment of optics will be minimal.

C. Work Statement

(1) Read Chapters 15-17, 21-30, and 34-36 in *Fundamentals of Physics*, Halliday, Resnick, and Walker (7th ed.)

(2) Write out solutions to the following problems (A few steps that outline the method of solution must be included):

Ch. 15: 4, 9, 11, 21, 24
Ch. 16: 4, 8, 10, 66, 70
Ch. 21: 19, 42
Ch. 22: 26, 27, 29, 55, 58, 77
Ch. 23: 3, 20, 27, 28, 30, 49, 50, 53
Ch. 24: 3, 6, 22, 25, 36, 63
Ch. 26: 12, 46
Ch. 28: 38, 41
Ch. 29: 17, 19, 36, 37, 39
Ch. 30: 2, 3, 6, 9, 22, 23, 30, 33
Ch. 34: 17

D. Schedule

Plan to meet with the instructor sometime during the first week of each month to review progress and discuss content. Meet with instructor more often during instructor office hours if needed. Complete work through Chapter 26 by November 7. Complete other chapters by December 5. Final exam is to be taken by December 9.

E. Evaluation

(1) How thorough and correct the assigned problems are completed (50%)

(2) Final exam with problems modeled after those assigned from the text (50%)