

Modern Physics I [PHY 306]

Spring 2003

Instructor

Dr. Douglas Young

Office

Willet Science Center Room 113

Phone Number

(478) 301-2704

Email

young_dt@mercer.edu

Class Webpage

[physics.mercer.edu/young/phy306\[S03\]/phy306.htm](http://physics.mercer.edu/young/phy306[S03]/phy306.htm)

Required Texts

Modern Physics by Kenneth Krane, 2nd ed. (Wiley, 1996)

SpaceTime Physics by Edwin Taylor and John Wheeler, 2nd ed (Freeman, 1992)

The New World of Mr. Tompkins, by George Gamow and Russell Stannard (Cambridge, 2001)

Schrödinger's Kittens and the Search for Reality, by John Gribbin (Back Bay Books, 1995)

Meeting Room and Times

Willet 106 12:00-12:50

Office Hours

MW 2:00-3:30

Prerequisites

PHY 305

Students are expected to be able to:

- Solve problems involving kinematics, forces (through the application of Newton's laws), conservation of energy, linear momentum, and angular momentum.
- Solve problems involving the use of differential and integral calculus.
- Discuss and write about the basic mathematical, conceptual, and experimental foundations of quantum mechanics.
- Solve problems involving the use of quantum mechanics.
- Discuss and write about the relationship between quantum and Newtonian mechanics.
- Discuss and write about the technological applications of quantum mechanics.

Course Objectives

At the end of this course, students will be able to:

- Discuss and write about the basic mathematical, conceptual, and experimental foundations of special relativity, nuclear physics, particle physics, astrophysics and cosmology.
- Solve problems involving the use of special relativity, nuclear physics, particle physics, astrophysics and cosmology.
- Discuss the write about the relationship between special relativity and Newtonian mechanics.
- Discuss and write about the technological applications of special relativity, nuclear physics, particle physics, astrophysics and cosmology.
- Communicate, both verbally and in writing, through self-consistent integration of mathematical formulae and English language sentence structures.

Topics Covered

Chapter 2,11-16 in Krane Book with additional readings from other books

Solid State Physics, Special Relativity, Nuclear Structure and Radioactivity, Nuclear Reactions, Elementary Particles, Astrophysics and General Relativity, Cosmology.

Note: This selection and scheduling of material in tentative and subject to change at the discretion of the instructor.

Grading Policy

- Homework: 26% (~6 Homework Assignments => ~4.3% per Assignment)
- Reading Quizzes: 23% (~20 Reading Quizzes => ~1% per Reading Quiz)
- Tests 51% (~3 tests => 17% per test)

Grade Scale

100	-	90	=	A	(4.0)
89	-	85	=	B+	(3.5)
84	-	80	=	B	(3.0)
79	-	75	=	C+	(2.5)
74	-	70	=	C	(2.0)
69	-	60	=	D	(1.0)
	≤	59	=	F	(0.0)

Class Policies

- All parts of this syllabus are subject to revision by the instructor and the Department of Physics.
- Dates for tests will be announced one class period ahead of time (i.e. there will be no "pop" quizzes or tests).
- Students are responsible for all information discussed in class. Be forewarned that students with more than an occasional absence risk doing poorly.
- Students are expected to treat each other courteously.
Racial and gender slurs will not be tolerated.
- Questions about points awarded on test and homework problems should be brought up as soon as these materials are handed back to students. All grades are final one week after tests and quizzes have been handed back.
- For homework turned in late, two points (out of 100 possible points) will be deducted from the assignment for each day that it is late.
- Makeup tests will be administered for excused absences only, and must be made up within one week of the date when the test was administered to the class. If a student knows in advance that a test will be missed, it is expected that the student will discuss a makeup time beforehand.
- The College of Liberal Art's academic policy will be followed. The Mercer University Honor Code binds all students. Any student caught cheating will be brought before the Honor Council. All quizzes and tests submitted for a grade should be the sole product of the student that submitted the work.
- Students who believe that they possess disabilities for which accommodation is required must so inform the instructor at the close of their first class meeting. They must then indicate the nature of their disability and the sort of reasonable accommodation requested. If you believe that you possess a disability for which accommodation must be made, you must consult with the instructor of this class immediately after your first class meeting. You will identify the disability, and the reasonable accommodation requested. The instructor will refer you to the office of the Dean of Students for evaluation, documentation of your disability, and a recommendation as to the accommodation, if any, to be provided. If you do NOT consult with the instructor ***and*** follow up at the Dean of Students, as provided above, you will thereby waive any claim to a disability and right to any accommodation pertaining thereto.