This course will introduce you to some of the underpinnings of 20th century physics: relativity and quantum mechanics. We'll be moving forward 300 years from 17th century Newtonian physics! The textbook, by Serway, is essential. It is full of interesting examples, historical anecdotes, and *most importantly* detailed examples of how to calculate things. Get Serway and *read it immediately*! You have to try to do as many problems as possible if you want to be able to digest the material and really *learn* it.

Assessment will be by means of assignments due after the end of every chapter, an in-class midterm in October, a final exam, and approximately one "surprise" pass/fail mini-quiz per week based on the week's readings and/or lectures. The assignments are crucial, not only because they make up a sizable portion of your mark but also because they help to prepare you for the mid-term and exam. You can not learn properly without doing. Study groups, work partners, and email discussions are encouraged, though every individual is responsible for all of the material.

I will occasionally hand out supplemental material to tie the course into the contemporary world of professional physics and the wider world as well. You will not be responsible for this material. It is also interesting to read good scientific biography to get some perspective on how research is/was actually done, albeit by famous scientists, see e.g. "Genius" by James Gleick. There are also excellent books that provide a social and human gloss on modern physics — like "The making of the atomic bomb" by Richard Rhodes.

Problems: End-of-chapter assignments (1% **per problem**) and (semi-regular) weekly in-class reading/review mini-quizes (1% each, marked **P/F**). The marks will be added directly into the final grade, though not in excess of 50%. [If *fewer* than 50 assignment questions and mini-quizzes are given, then the total will be scaled up to give 50% maximum.] Late assignments will have one mark deducted, unless an explicit extension is given. Late assignments will not be accepted after solutions are distributed. **Try to be very explicit about where you are feeling uncertain in your problem sets (*this will not cause you to lose marks*).** In the same vein, in every problem set I will ask you to tell me something that puzzles you about the material we have covered.

Evaluation:		
	Assignments and Reading quizzes	50%
	Midterm	0% or 15% (best of)
	Final	50% or 35%

Letter Grade Equivalents:

A+	90-100%,	**A**	85-89.9%,	**A-**	80-84.9%
B+	75-79.9%,	**B**	70-74.9%,	**B-**	65-69.9%
C+	62-64.9%,	**C**	58-61.9%,	**C-**	55-57.9%
D	50-54.9%,	**F**	0-49.9%		

PHYC 2515: MODERN PHYSICS Fall 2007

Instructor	Dr. Andrew Rutenberg	Dunn 223	andrew.rutenberg@dal.ca
Tutor	Vincent Chevrier		chevrier@dal.ca
WWW:	www.physics.dal.ca/~adr/COURSEPAGES/modern2007.html		

Lectures	MWF	10:35 – 11:25am	Dunn 302
Weekly Tutorials		Tuesday 3:30pm	Dunn 302
Office Hours	Mon	4pm	Dunn223
	Tues	3pm	Dunn223
	or "pot luck" or by email arrangement.		

Books and Outline

Serway	Modern Physics (3rd)	required
Krane	Modern Physics (2nd)	similar but simpler
Tipler and Llewellyn	Modern Physics (4th)	similar but advanced
Kittel	Berkeley Mechanics (2nd)	basic special relativity
McGlinn	Introduction to Relativity	advanced SR
Townsend	Modern Approach to Quantum Mechanics	QuantumI text
Schroeder	Introduction to Thermal Physics	stat mech

The course is based on the book by Serway. You will be responsible for much of the material in Chapters 1-7. We will cover material at the rate of one chapter every one to two weeks. It is essential that you read the appropriate chapter before the lectures, as a first stage towards understanding and to prepare for the mini-quizzes.

Chapter 1	Relativity I
Chapter 2	Relativity II
Chapter 3	Quantum nature of Light
handouts	Random Walks and Diffusion
midterm (in class)	Oct 17
Chapter 4	Particle nature of Matter
Chapter 5	Matter Waves
Chapter 6	Quantum Mechanics in One Dimension
Chapter 7	Tunneling Phenomena
final exam	

Note that Monday Dec 3 is the last class, and that there are holidays on Monday Oct 8 and Monday Nov 12. I welcome suggestions and questions throughout the course, about the material, the lectures, the tutorials, and the problem sets.