Physics 544 Spring Quarter 2011

Classical Electrodynamics
Special Relativity
Relativistic Electrodynamics
and
General Relativity

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Office hours: Right after class, or by appointment

Textbooks
The Feynman Lectures on Physics Volume 2
Spacetime Physics
Exploring Black Holes
General Relativity from A to B
QED: The Strange Theory of Light and Matter

Class Website: http://faculty.washington.edu/seattle

Course grades will be based on written papers and take home exams.

Requirements

Take home exams:

(1) Electrodynamics CED and RED

(2) Special Relativity SR

(3) General Relativity GR

Primarily Qualitative Exams

Understand the Vocabulary

Short papers:

(1) QED: The Strange Theory of Light and Matter

(2) General Relativity from A to B

(3) Einstein and Minkowski SR papers

(4) Einstein $E=mc^2$ papers

	A	B	C
1			**Feynman Lectures on Physics Volume 2**
2	ED	Chapter 18	The Maxwell equations
3	ED	Chapter 20	Solutions of Maxwell's equations in free space
4	ED	Chapter 21	Solutions of Maxwell's equations with currents and charges
5			
6	RED	Chapter 25	Electrodynamics in relativistic notation
7	RED	Chapter 26	Lorentz transformations of the fields
8	RED	Chapter 27	Field energy and field momentum
9			
10			
11			**Spacetime Physics**
12	SR	Chapter 1	The Geometry of Spacetime
13	SR	Chapter 2	Momentum and Energy
14	SR	Chapter 3	The Physics of Curved Spacetime
15	SR		
16			
17			**Exploring Black Holes**
18	GR	Chapter 1	Speeding (Review of Special Relativity).
19	GR	Chapter 2	Curving (Spacetime Near a Non-Rotating Black Hole).
20	GR	Chapter 3	Plunging (Diving Toward a Black Hole).
21	GR	Chapter 4	Orbiting (Zooming Around a Black Hole).
22	GR	Chapter 5	Seeing (Bending and Orbiting Light).
23			
24			
25			**General Relativity from A to B**
26	GR	Chapter 1	Events and Space-Time: The Basic Building Blocks
27	GR	Chapter 2	The Aristotelian View: A "Personalized" Framework
28	GR	Chapter 3	The Galilean View: A Democratic Framework
29	GR	Chapter 4	Difficulties with the Galilean View
30	GR	Chapter 5	The Interval: The Fundamental Geometrical Object
31	GR	Chapter 6	The Physics and Geometry of the Interval
32	GR	Chapter 7	Einstein's Equation: The Final Theory
33	GR	Chapter 8	An Example: Black Holes
34			
35			
36	QED		**QED: The Strange Theory of Light and Matter**
37	QED	Chapter 1	Introduction
38	QED	Chapter 2	Photons: Particles of Light
39	QED	Chapter 3	Electrons and their interactions
40	QED	Chapter 4	Loose Ends