PHYSICS 107-TV THE IDEAS OF MODERN PHYSICS FALL 1995 Prof Bernice Durand
CABLE 15 MWF 9-10 am start Sep 6 CH 21 T 3-6 am start Sep 5 with Lecs 1,2,3
Lecture tapes on reserve in College, Steenbock, Physics Libraries
Prof's Discs 3331 Sterling M 1:20, 7:30; T 2:25, 4:35; Th 11, 1:20 start Sep 11
WEEK LEC DATE SUBJECT for info bdurand@wishep.physics.wisc.edu 262-3827

WEEK	LEC	DATE	SUBJECT
1	1	W Sep 6	The Earliest Science: Seasons and the Moon
	2	F Sep 8	Demystifying the Heavens: Tycho, Kepler, Galileo
2	3	M Sep 11	Two Leaps of Logic: Galileo
	4	W Sep 13	Falling Motion: Galileo's Kinematics
	5	F Sep 15	Three Great Principles: Galileo
3	6	M Sep 18	Conservation of Momentum: Descartes and Huygens
	7	W Sep 20	Three Great Laws of Motion: Newton's Dynamics
		Th Sep 21	HOMEWORK 1A DUE (over Lecs 1-6)
	8	F Sep 22	The Universal Law of Gravitation: Newton
4	9	M Sep 25	Conservation of Energy
	10	W Sep 27	Electric and Magnetic Forces and Fields: Coulomb, Ampere, and Faraday
	11	F Sep 29	The First Unified Field Theory: Maxwell
5	12	M Oct 2	Waves: Simple Behavior of a Simple System
	13	W Oct 4	Sound: Mechanical Waves in a Medium
		Th Oct 5	HOMEWORK 1B DUE (over Lecs 7-11)
	14	F Oct 6	Light: Electromagnetic Waves in a Field
6	15	M Oct 9	Chaos: Complex Behavior of a Simple System
	16	W Oct 11	Light Waves are Different: the Famous Missing Gamma Factor
		W Oct 11	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		Th Oct 12	HOUR EXAM ON UNIT 1 (Lecs 1-11) 7:15-8:15 pm 1300 Sterling
	17	F Oct 13	The Two Postulates of Special Relativity: Einstein
7	18	M Oct 16	Gedanken Experiments on Simultaneity and Length
	19	W Oct 18	Gedanken Experiments on Clocks and Time
		Th Oct 19	HOMEWORK 2A DUE (over Lecs 12-17)
	20	F Oct 20	Spacetime: Gamma Factor Effects and Time as the 4th Dimension
8	21	M Oct 23	Spacetime Diagrams
	22	W Oct 25	E = m(c squared): Energy and Mass are Equivalent
	23	F Oct 27	E = m(c squared): Bombs, Stars, and Reactors
9	24	M Oct 30	Relativity in Action: Big Gamma Factors
	25	W Nov 1	The Equivalence Principle: Einstein
		Th Nov 2	HOMEWORK 2B DUE (over Lecs 18-24)
	26	F Nov 3	Curved Spacetime: Physics is Math
10	27	M Nov 6	Big Bang Cosmology
	28	W Nov 8	Black Holes and Dark Matter in the Universe: "Seeing" the Very Large
		Th Nov 9	HOMEWORK 2C DUE (over Lecs 25-28)
	29	F Nov 10	Atoms, Electrons, and Nuclei: "Seeing" the Very Small
11	30	M Nov 13	The Quantum Physics of Light: Planck, Spectra of Solids
	31	W Nov 15	Waves are Particles: Einstein, the Photoelectric Effect
		W Nov 15	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		Th Nov 16	HOUR EXAM ON UNIT 2 (Lecs 12-28) 7:15-8:15 pm 1300 Sterling
	32	F Nov 17	The Quantum Physics of Matter: Bohr, the Hydrogen Atom
12	33	M Nov 20	Particles are Waves: deBroglie, Schrodinger, and Born
	34	W Nov 22	The Uncertainty Principle: Heisenberg
		Th Nov 23	THANKSGIVING RECESS: no classes Nov 23, no broadcast Nov 24
13	35	M Nov 27	Quantum Physics in Action: Superconductivity
	36	W Nov 29	Quantum Physics in the Sky: Sunsets, Ozone, and the Greenhouse Effect
		Th Nov 30	HOMEWORK 3A DUE (over Lecs 29-34)
	37	F Dec 1	Quantized Energy Levels: Lasers and Atomic Clocks
14	38	M Dec 4	Quantum Electronics and Computer Chips
	39	W Dec 6	Quantum Field Theory: Feynman's Dynamics
		Th Dec 7	HOMEWORK 3B DUE (over Lecs 35-38)
	40	F Dec 8	Nature's Building Blocks: Particles, Quarks, and Leptons
15	41	M Dec 11	The Four Forces: Gauge Bosons
	42	W Dec 13	Inner Space/Outer Space: Particle Physics Meets Cosmology
		Th Dec 14	HOMEWORK 3C DUE (over Lecs 39-42)
	43	F Dec 15	The Nobel Prize: Tracing the Ideas of Modern Physics
16		M Dec 18	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		T Dec 19	HOUR EXAM ON UNIT 3 (Lecs 29-43) 2:45-3:45 pm 1300 Sterling

PHYSICS 107 THE IDEAS OF MODERN PHYSICS FALL 1995 TV ONLY!

Professor Bernice Durand bdurand@wishep.physics.wisc.edu 262-3827

CABLE 15 MWF 9-10 am start Sep 6 CH 21 T 3-6 am start Sep 5 with Lecs 1,2,3

Prof's Discs 3331 Sterling M 1:20, 7:30 T 2:25, 4:35 Th 11, 1:20 start Sep 11

WEEK	LEC	DATE	SUBJECT
1	1	W Sep 6	The Earliest Science: Seasons and the Moon
	2	F Sep 8	Demystifying the Heavens: Tycho, Kepler, Galileo
2	3	M Sep 11	Two Leaps of Logic: Galileo
	4	W Sep 13	Falling Motion: Galileo's Kinematics
	5	F Sep 15	Three Great Principles: Galileo
3	6	M Sep 18	Conservation of Momentum: Descartes and Huygens
	7	W Sep 20	Three Great Laws of Motion: Newton's Dynamics
		Th Sep 21	HOMEWORK 1A DUE (over Lecs 1-6)
	8	F Sep 22	The Universal Law of Gravitation: Newton
4	9	M Sep 25	Conservation of Energy
	10	W Sep 27	Electric and Magnetic Forces and Fields: Coulomb, Ampere, and Faraday
	11	F Sep 29	The First Unified Field Theory: Maxwell
5	12	M Oct 2	Waves: Simple Behavior of a Simple System
	13	M Oct 4	Sound: Mechanical Waves in a Medium
		Th Oct 5	HOMEWORK 1B DUE (over Lecs 7-11)
	14	F Oct 6	Light: Electromagnetic Waves in a Field
6	15	M Oct 9	Chaos: Complex Behavior of a Simple System
	16	W Oct 11	Light Waves are Different: the Famous Missing Gamma Factor
		W Oct 11	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		Th Oct 12	HOUR EXAM ON UNIT 1 (Lecs 1-11) 7:15-8:15 pm 1300 Sterling
	17	F Oct 13	The Two Postulates of Special Relativity: Einstein
7	18	M Oct 16	Gedanken Experiments on Simultaneity and Length
	19	W Oct 18	Gedanken Experiments on Clocks and Time
		Th Oct 19	HOMEWORK 2A DUE (over Lecs 12-17)
	20	F Oct 20	Spacetime: Gamma Factor Effects and Time as the 4th Dimension
8	21	M Oct 23	Spacetime Diagrams
	22	W Oct 25	E = m(c squared): Energy and Mass are Equivalent
	23	F Oct 27	E = m(c squared): Bombs, Stars, and Reactors
9	24	M Oct 30	Relativity in Action: Big Gamma Factors
	25	W Nov 1	The Equivalence Principle: Einstein
		Th Nov 2	HOMEWORK 2B DUE (over Lecs 18-24)
	26	F Nov 3	Curved Spacetime: Physics is Math
10	27	M Nov 6	Big Bang Cosmology
	28	W Nov 8	Black Holes and Dark Matter in the Universe: "Seeing" the Very Large
		Th Nov 9	HOMEWORK 2C DUE (over Lecs 25-28)
	29	F Nov 10	Atoms, Electrons, and Nuclei: "Seeing" the Very Small
11	30	M Nov 13	The Quantum Physics of Light: Planck, Spectra of Solids
	31	W Nov 15	Waves are Particles: Einstein, the Photoelectric Effect
		W Nov 15	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		Th Nov 16	HOUR EXAM ON UNIT 2 (Lecs 12-28) 7:15-8:15 pm 1300 Sterling
	32	F Nov 17	The Quantum Physics of Matter: Bohr, the Hydrogen Atom
12	33	M Nov 20	Particles are Waves: deBroglie, Schrodinger, and Born
	34	W Nov 22	The Uncertainty Principle: Heisenberg
		Th Nov 23	THANKSGIVING RECESS: no classes Nov 23, no broadcast Nov 24
13	35	M Nov 27	Quantum Physics in Action: Superconductivity
	36	W Nov 29	Quantum Physics in the Sky: Sunsets, Ozone, and the Greenhouse Effect
		Th Nov 30	HOMEWORK 3A DUE (over Lecs 29-34)
	37	F Dec 1	Quantized Energy Levels: Lasers and Atomic Clocks
14	38	M Dec 4	Quantum Electronics and Computer Chips
	39	W Dec 6	Quantum Field Theory: Feynman's Dynamics
		Th Dec 7	HOMEWORK 3B DUE (over Lecs 35-38)
	40	F Dec 8	Nature's Building Blocks: Particles, Quarks, and Leptons
15	41	M Dec 11	The Four Forces: Gauge Bosons
	42	W Dec 13	Inner Space/Outer Space: Particle Physics Meets Cosmology
		Th Dec 14	HOMEWORK 3C DUE (over Lecs 39-42)
	43	F Dec 15	The Nobel Prize: Tracing the Ideas of Modern Physics
16		M Dec 18	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		T Dec 19	HOUR EXAM ON UNIT 3 (Lecs 29-43) 2:45-3:45 pm 1300 Sterling

PHYSICS 107 THE IDEAS OF MODERN PHYSICS FALL 1995 TV ONLY!

Professor Bernice Durand bdurand@wishep.physics.wisc.edu 262-3827

CABLE 15 MWF 9-10 am start Sep 6 CH 21 T 3-6 am start Sep 5 with Lecs 1,2,3

Prof's Discs 3331 Sterling M 1:20, 7:30 T 2:25, 4:35 Th 11, 1:20 start Sep 11

WEEK	LEC	DATE	SUBJECT
1	1	W Sep 6	The Earliest Science: Seasons and the Moon
	2	F Sep 8	Demystifying the Heavens: Tycho, Kepler, Galileo
2	3	M Sep 11	Two Leaps of Logic: Galileo
	4	W Sep 13	Falling Motion: Galileo's Kinematics
	5	F Sep 15	Three Great Principles: Galileo
3	6	M Sep 18	Conservation of Momentum: Descartes and Huygens
	7	W Sep 20	Three Great Laws of Motion: Newton's Dynamics
		Th Sep 21	HOMEWORK 1A DUE (over Lecs 1-6)
	8	F Sep 22	The Universal Law of Gravitation: Newton
4	9	M Sep 25	Conservation of Energy
	10	W Sep 27	Electric and Magnetic Forces and Fields: Coulomb, Ampere, and Faraday
	11	F Sep 29	The First Unified Field Theory: Maxwell
5	12	M Oct 2	Waves: Simple Behavior of a Simple System
	13	M Oct 4	Sound: Mechanical Waves in a Medium
		Th Oct 5	HOMEWORK 1B DUE (over Lecs 7-11)
	14	F Oct 6	Light: Electromagnetic Waves in a Field
6	15	M Oct 9	Chaos: Complex Behavior of a Simple System
	16	W Oct 11	Light Waves are Different: the Famous Missing Gamma Factor
		W Oct 11	REVIEW SESSION 7:00-8:30 pm 1300 Sterling
		Th Oct 12	HOUR EXAM ON UNIT 1 (Lecs 1-11) 7:15-8:15 pm 1300 Sterling
	17	F Oct 13	The Two Postulates of Special Relativity: Einstein
7	18	M Oct 16	Gedanken Experiments on Simultaneity and Length
	19	W Oct 18	Gedanken Experiments on Clocks and Time
		Th Oct 19	HOMEWORK 2A DUE (over Lecs 12-17)
	20	F Oct 20	Spacetime: Gamma Factor Effects and Time as the 4th Dimension
8	21	M Oct 23	Spacetime Diagrams
	22	W Oct 25	E = m(c squared): Energy and Mass are Equivalent
	23	F Oct 27	E = m(c squared): Bombs, Stars, and Reactors
9	24	M Oct 30	Relativity in Action: Big Gamma Factors
	25	W Nov 1	The Equivalence Principle: Einstein
		Th Nov 2	HOMEWORK 2B DUE (over Lecs 18-24)
	26	F Nov 3	Curved Spacetime: Physics is Math
10	27	M Nov 6	Big Bang Cosmology
	28	W Nov 8	Black Holes and Dark Matter in the Universe:

"Seeing" the
Very Large
Th Nov 9 HOMEWORK 2C DUE (over Lecs 25-28)
29 F Nov 10 Atoms, Electrons, and Nuclei: "Seeing" the Very Small
11 30 M Nov 13 The Quantum Physics of Light: Planck, Spectra of Solids
31 W Nov 15 Waves are Particles: Einstein, the Photoelectric Effect
W Nov 15 REVIEW SESSION 7:00-8:30 pm 1300 Sterling
Th Nov 16 HOUR EXAM ON UNIT 2 (Lecs 12-28) 7:15-8:15 pm 1300 Sterling
32 F Nov 17 The Quantum Physics of Matter: Bohr, the Hydrogen Atom
12 33 M Nov 20 Particles are Waves: deBroglie, Schrodinger, and Born
34 W Nov 22 The Uncertainty Principle: Heisenberg
Th Nov 23 THANKSGIVING RECESS: no classes Nov 23, no broadcast Nov 24
13 35 M Nov 27 Quantum Physics in Action: Superconductivity
36 W Nov 29 Quantum Physics in the Sky: Sunsets, Ozone, and the
Greenhouse Effect
Th Nov 30 HOMEWORK 3A DUE (over Lecs 29-34)
37 F Dec 1 Quantized Energy Levels: Lasers and Atomic Clocks
14 38 M Dec 4 Quantum Electronics and Computer Chips
39 W Dec 6 Quantum Field Theory: Feynman's Dynamics
Th Dec 7 HOMEWORK 3B DUE (over Lecs 35-38)
40 F Dec 8 Nature's Building Blocks: Particles, Quarks, and Leptons
15 41 M Dec 11 The Four Forces: Gauge Bosons
42 W Dec 13 Inner Space/Outer Space: Particle Physics Meets Cosmology
Th Dec 14 HOMEWORK 3C DUE (over Lecs 39-42)
43 F Dec 15 The Nobel Prize: Tracing the Ideas of Modern Physics
16 M Dec 18 REVIEW SESSION 7:00-8:30 pm 1300 Sterling
T Dec 19 HOUR EXAM ON UNIT 3 (Lecs 29-43) 2:45-3:45 pm 1300 Sterling

INFORMATION ABOUT PHYSICS 107-TV
The Ideas of Modern Physics

Professor Bernice Durand, 262-3827, 4205 Chamberlin Hall, mailbox on 2nd floor of Chamberlin, email address: bdurand@wishep.physics.wisc.edu. Do not call me at home except for an emergency. Mailing address: Prof. Bernice Durand, Dept. of Physics, 1150 University Ave., Madison, WI 53706-1390.

Reference *Physics for Poets, 3rd Ed.*, R.H. March, McGraw-Hill, 1992. Not required, but recommended and very useful. The reference book used to be required as a text, but over a quarter of the lectures are not covered in the book, so don't count on the book to bail you out!

Schedule See the gray schedule sheet (syllabus). Please become familiar with it.

Goals Physics 107 is a concepts course designed to acquaint you with

- the vocabulary of physics
- the personalities and methods of some great physicists
- the two great ideas of twentieth century physics, relativity and quantum theory
- the physics subjects you will most likely be reading about in the future.

My aim is for you to understand the concepts and how to apply them in a very simple way, not for you to become an expert problem solver. I will not ask you to be creative in physics!

Description There are three units. **Unit 1** sweeps from Aristotle through Maxwell, covering more than 2000 years in four weeks. While partly historical, and heavily descriptive, this unit does include simple mathematical formulas associated with some of the physics accomplishments of Galileo, Kepler, Descartes, and Newton. In Unit 1 you will learn much of the necessary vocabulary and methodology for the course, so the whole class will have the same background as we start 20th Century physics.

Unit 2 is the longest unit. It starts with the classical subjects of waves and chaos, then it centers on Einstein's theory of special relativity, published in 1905 and one of the two great concepts of modern physics. During these three weeks you will not only grasp the logic behind the relativistic distortion of space and time, but also learn to calculate the magnitude of that distortion. We close the unit with general relativity, also Einstein's theory, then modern cosmology, or how the whole universe evolves. This is a difficult and rewarding unit, which has cured most students of math anxiety.

Unit 3 first races through basic quantum mechanics, the second great concept of twentieth century physics, in just two weeks. Since Planck introduced the "quantum" in 1900, physics has exploded, as has the number of physicists. We will become familiar with the work of many Nobel Physics laureates. In our final three weeks we come up to date with a crash course in modern applications of quantum physics, quantum field theory, and particle physics.

Lectures MWF 9:00-10:00 am, Cable Channel 15, starting Wed, Sep 6; and T 3:00-6:00 am, Channel 21 ("VCR Semester"), starting Tue, Sep 5 with Lectures 1, 2, 3. Every Tuesday on Channel 21 the Wed, Fri, Mon lectures for the next week will be shown. I recommend that you tape the lectures. This course was videotaped in the spring of 1995, to be shown this semester on TV. In addition to the lecture hall presentations, which include demonstrations (experiments) and my commentary on the concepts and physicists we are studying, each televised lecture has an opener of a demonstration I couldn't do in the lecture hall, or a visit to a lab, or an interview.

Tips Tape the lectures, or use tapes on reserve in one of the libraries (see other side of this sheet). That way you can replay parts you miss. Don't try to copy quotes (for interest only) or take many notes on the introductory scenes. I say what I write on the board as I write it, so if you miss what's written, listen to my words. The titles of sections in the lecture will appear on your screen to help you find subjects.

Discussion Sections DISCUSSION SECTIONS START MONDAY, SEPTEMBER 11. These are really HOMEWORK HELP SESSIONS, and they are optional but *very useful*. If you make an appointment with me to get help just before homework is due, and you haven't been to discussion sections, I won't be happy. Homework is due and exams are given on Thursdays, and there are six discussion times leading into Thursdays. I will start each discussion by answering questions about lectures or text material, then *I will go systematically through the homework which is related to the lectures since the previous discussion.* I will do similar math problems, discuss essay questions, and answer all questions except "what exact words should I use?" **Discussions all meet in Room 3331 Sterling, and I (Prof. Durand) will lead all of them. They start Monday, September 11. The schedule is**

Monday at	1:20	Tuesday at	2:25	Thursday at	11:00
	7:30 pm		4:35		1:20

Reserve Materials Tapes of all lectures, all handouts, and a copy of the reference book will be on reserve in the **Physics Library**, 4220 Chamberlin, hours M-Th 8-9, F 8-5, Sat and Sun 1-5, 262-9500. Tapes of all lectures will also be on reserve at the **College and Steenbock Libraries**, along with a copy of the text. Tell the librarian or me if you have a problem with a tape.

To Get Help Read this sheet for course information. Go to discussions for lecture and homework help. See me for help beyond discussion section or for special problems. ASK ME—I'LL BE HAPPY TO ANSWER! Call or email.

Office Hours I prefer that you make an appointment, since if you need to see me beyond discussion sections it is probably for something pretty serious. I don't want to sit at my desk for some fixed time each week with no students showing up, when I might need to be doing something elsewhere. I am usually in my office, but call to check. I answer messages on my answering machine or email as soon as I get them.
Before exams and if necessary before homework is due I will hold "open house" office hours, to be announced in discussion and by email. I also have a review session the evening before every exam.

Grade **60%** from *three hour exams*, **40%** from *eight homework sets*. There will be no *comprehensive final exam*, but the *third hour exam will be given at the assigned final examination time*. **The three hour exams will be performance weighted:** your best exam counts the most and your poorest counts the least. The weights will be *25% - 20% - 15%*. My curve is likely to be A 90-100, AB 87-89, B 75-86, BC 72-74, C 60-71, D 50-59.

Homework 40% of your grade will be based on required homework questions, about one from each lecture. Homework assignments are on blue paper. You should do each question right after the lecture related to that question, so if you don't understand it you can get help in discussion section. Much of the homework will be short essays and some will be math problems. Don't be lulled—writing a paragraph about a concept is not easy! For help, come to discussion sections. For serious math or physics anxiety help, make an appointment with me. The exams will draw heavily on homework. The graders will try to have your work back to you by the dates on the schedule.

Working together I encourage you to work together on homework, but *you must ultimately write your own answers.* **IT IS CHEATING TO TURN IN IDENTICAL ANSWERS!** These include identical essay answers AND glaringly identical numerical answers, so *WRITE YOUR OWN ANSWERS!* You will get zero for identical solutions and may end up with a written reprimand in your university record. We will form study groups from those who indicate an interest on their initial blue sheet.

Exams THE FIRST TWO EXAMS WILL BE ON THURSDAY EVENINGS AT 7:15 PM, OCTOBER 12 AND NOVEMBER 16. SEE, CALL, OR EMAIL ME IF YOU HAVE A CONFLICT. THE THIRD EXAM IS TUESDAY, DECEMBER 19 AT 2:45 PM. **DO NOT MAKE TRAVEL PLANS TO LEAVE BEFORE THEN.** THERE WILL BE NO LATE EXAMS GIVEN, EXCEPT FOR VALIDATED MEDICAL OR FAMILY EMERGENCIES. **ANY ARRANGEMENTS FOR ANY ALTERNATIVE EXAM TIMES OR EXTENDED TIME ON EXAMS MUST BE MADE WELL IN ADVANCE!** See me *soon* if you have serious test anxiety, or other problems which necessitate special exam arrangements. Extended time Exams 1 and 2 will be in Room 1313 Sterling at 7:00 pm. The first two exams will be 60% objective, 40% short answer. The third exam will be all objective. Your green review sheet before each exam is taken from recent exams (with answers), to help you prepare for the exam. You may bring *one* $8\frac{1}{2} \times 11$ *page of notes* (both sides) to each exam. **The notes must be your own, not my handouts.** You may bring outlines for essay questions, but not complete paragraphs. Do not photocopy reduced versions of my handouts for your notes!

Exam Reviews The night before all three exams I will hold a question-and-answer review session in Room 1300. The week before the exam you will receive a review sheet, and we will go over that plus other questions at the review session.

Math There will not be much emphasis on math as a tool, but to understand physics conceptually you must use some high-school level math. Homework, essays, and exams will emphasize writing more than mathematics. See me *soon* if you have serious math anxiety.

Regrades If you don't understand how a homework or exam question was graded, first read my solution—you may then understand. If not, write me a note stating which question you want me to regrade, and why. Staple or clip the note to your *whole* homework set or exam, and give it to me. I will process it as soon as possible. (I may not raise the grade, but I'll explain why.) Also give your homework or exam to me if the score is mis-added.

Tutors *I do not recommend getting a tutor for this course.* The University Physics Society, Room 2321 Sterling, 263-2805, does have a tutoring service, but unfortunately many physics majors have not yet studied the material in Units 2 and 3, or are unlikely to be able to discuss the material in words instead of equations. Please just ask me for help, and start early to get help!

Physics Museum Two museum rooms, to the right as you enter Sterling Hall, have demonstrations of physics phenomena which are both fun and instructive. There is an interactive computer animation of some Physics 107 demonstrations, on one of the Macintoshes in the second room.

PHYSICS 107-TV SYLLABUS FALL 1995 PROF. B. DURAND

Week	*Lec*	*Date*	*Subject*	*Take notice!*
1	1	W Sep 6	The Earliest Science: Seasons and the Moon	Course Info, HW1A Assignment TURN IN YOUR BLUE SHEET!!
	2	F Sep 8	Demystifying the Heavens: Tycho, Kepler, Galileo	
2	3	M Sep 11	Two Leaps of Logic: Galileo	
	4	W Sep 13	Falling Motion: Galileo's Kinematics	Last day to drop w/o record
	5	F Sep 15	Three Great Principles: Galileo	Last day to add
3	6	M Sep 18	Conservation of Momentum: Descartes and Huygens	T Sep 19 HW1B Assign
	7	W Sep 20	Three Great Laws of Motion: Newton's Dynamics	TH SEP 21 HW 1A DUE
	8	F Sep 22	The Universal Law of Gravitation: Newton	
4	9	M Sep 25	Conservation of Energy	
	10	W Sep 27	Electric and Magnetic Forces and Fields: Coulomb, Ampère, and Faraday	Th Sep 28 HW 1A back, HW2A Assign
	11	F Sep 29	The First Unified Field Theory: Maxwell ... END OF UNIT 1	
5	12	M Oct 2	Waves: Simple Behavior of a Simple System	
	13	W Oct 4	Sound: Mechanical Waves in a Medium	TH OCT 5 HW 1B DUE, Rev Sheet 1
	14	F Oct 6	Light: Electromagnetic Waves in a Field	
6	15	M Oct 9	Chaos: Complex Behavior of a Simple System	
	16	W Oct 11	Light Waves are Different: the Famous Missing Gamma Factor	
	Rev	W Oct 11	REVIEW SESSION, 7:00-8:30 pm, 1300 Sterling	HW 1B back, use Review Sheet 1
	Exam	Th Oct 12	EXAM ON UNIT 1 (1-11), 7:15-8:15 pm, 1300 Sterling Extended time exam 7:00, 1313 Sterling	EXAM 1 1 page notes allowed
	17	F Oct 13	The Two Postulates of Special Relativity: Einstein	
7	18	M Oct 16	Gedanken Experiments on Simultaneity and Length	T Oct 17 HW 2B Assign
	19	W Oct 18	Gedanken Experiments on Clocks and Time	TH OCT 19 HW 2A DUE, EX 1 back
	20	F Oct 20	Spacetime: Gamma Factor Effects and Time as the Fourth Dimension	
8	21	M Oct 23	Spacetime Diagrams	
	22	W Oct 25	$E = mc^2$: Energy and Mass are Equivalent	Th Oct 26 HW 2A back
	23	F Oct 27	$E = mc^2$: Bombs, Stars, and Reactors	
9	24	M Oct 30	Relativity in Action: Big Gamma Factors	T Oct 31 HW 2C Assign
	25	W Nov 1	The Equivalence Principle: Einstein	TH NOV 2 HW 2B DUE
	26	F Nov 3	Curved Spacetime: Physics is Math	Last day to drop
10	27	M Nov 6	Big Bang Cosmology	
	28	W Nov 8	Black Holes and Dark Matter in the Universe: "Seeing" the Very Large ... END OF UNIT 2	TH NOV 9 HW2C DUE, HW 2B back, Rev Sht 2, HW 3A Assign, Unit 3 Packet
	29	F Nov 10	Atoms, Electrons, and Nuclei: "Seeing" the Very Small	
11	30	M Nov 13	The Quantum Physics of Light: Planck, Spectra of Solids	
	31	W Nov 15	Waves are Particles: Einstein, the Photoelectric Effect	
	Rev	W Nov 15	REVIEW SESSION, 7:00-8:30 pm, 1300 Sterling	HW 2C back, Use Review Sheet 2
	Exam	Th Nov 16	EXAM ON UNIT 2 (12-28), 7:15-8:15 pm, 1300 Sterling Extended time exam 7:00, 1313 Sterling	EXAM 2 1 page notes allowed
	32	F Nov 17	The Quantum Physics of Matter: Bohr, the Hydrogen Atom	
12	33	M Nov 20	Particles are Waves: deBroglie, Schrödinger, and Born	T Nov 21 HW 3B Assign
	34	W Nov 22	The Uncertainty Principle: Heisenberg	Last Day to Withdraw Nov 24
	Hol	Nov 23-24	THANKSGIVING RECESS TH, F	No Broadcast Nov 24
13	35	M Nov 27	Quantum Physics in Action: Superconductivity	Supercond Sheet
	36	W Nov 29	Quantum Physics in the Sky: Sunsets, Ozone, and the Greenhouse Effect	Sky Sheet TH NOV 30 HW 3A DUE, EX 2 back
	37	F Dec 1	Quantized Energy Levels: Lasers and Atomic Clocks	Energy Levels Sheet
14	38	M Dec 4	Quantum Electronics and Computer Chips	Electronics/Chips Sheet T Dec 5 HW 3C Assign
	39	W Dec 6	Quantum Field Theory: Feynman's Dynamics	TH DEC 7 HW3B DUE, HW3A back
	40	F Dec 8	Nature's Building Blocks: Particles, Quarks, and Leptons	Building Blocks Sheet
15	41	M Dec 11	The Four Forces: Gauge Bosons, Course Evaluation This Week	Four Forces Sheet
	42	W Dec 13	Inner Space/Outer Space: Particle Physics Meets Cosmology	Inner Space/Outer Space Sheet TH DEC 14 HW3C DUE, HW3B back, Review Sheet 3
	43	F Dec 15	The Nobel Prize: Tracing the Ideas of Modern Physics ... END OF UNIT 3	Nobel Sheets
16	Rev	M Dec 18	REVIEW SESSION 7:00-8:30 pm, 1300 Sterling	HW 3C back, Use Review Sheet 3
	Exam	T Dec 19	EXAM ON UNIT 3 (29-43), 2:45-3:45 pm, Room 1300 Sterling	EXAM 3 1 page notes allowed
	Gr	W Dec 20	Final Grades posted, noon, 4205 Chamberlin	Grades

THURSDAYS ARE BIG DAYS IN PHYSICS 107-TV!

Important dates for you are when you hand in homework or take exams. Those all happen on Thursdays this semester, except the third exam on a Tuesday. You must hand in your own homework, to me at discussion or at my office (4205 Chamberlin, under the door if I'm not there), or mail it — all so I get it by 4:00 Thursday afternoon. Call me (262-3827) or email me by the deadline if something happens which makes you late. Follow the homework instructions. New assignments and graded exams or homework may be picked up in discussion or at my office, ready by the dates indicated below. Call me if you can't pick it up. Graded work will be accompanied by solutions. Sometimes I'll have graded work ready sooner, which I'll announce in discussion and on email.

DATE			TURN IN	PICK UP
Now	Aug 28	or asap	blue sheet	Information Packet
Tue	Sep 19			Homework (HW) 1B Assignment
Thu	Sep 21	by 4:00 pm	Homework 1A	
Thu	Sep 28			Graded HW 1A, HW 2A Assignment
Thu	Oct 5	by 4:00 pm	Homework 1B	Review Sheet 1
Wed	Oct 11	7:00 pm		Graded Homework 1B
Thu	Oct 12	7:15 pm	Take Exam 1	
Tue	Oct 17			Homework 2B Assignment
Thu	Oct 19	by 4:00 pm	Homework 2A	Graded Exam 1
Thu	Oct 26			Graded Homework 2A
Tue	Oct 31			Homework 2C Assignment
Thu	Nov 2	by 4:00 pm	Homework 2B	
Thu	Nov 9	by 4:00 pm	Homework 2C	Graded HW 2B, Review Sheet 2, HW 3A Assignment, Unit 3 Packet
Wed	Nov 15	7:00 pm		Graded Homework 2C
Thu	Nov 16	7:15 pm	Take Exam 2	
Tue	Nov 21			Homework 3B Assignment
Thu	Nov 30	by 4:00 pm	Homework 3A	Graded Exam 2
Tue	Dec 5			Homework 3C Assignment
Thu	Dec 7	by 4:00 pm	Homework 3B	Graded Homework 3A
Thu	Dec 14	by 4:00 pm	Homework 3C	Graded HW 3B, Review Sheet 3
Mon	Dec 18	7:00 pm		Graded Homework 3C
Tue	Dec 19	2:45 pm	Take Exam 3	
Wed	Dec 20	noon		Grades Posted at my Office

PHYSICS 107-TV
INFORMATION PACKET
FALL 1995
Professor Bernice Durand

Welcome to Physics 107-TV, the Ideas of Modern Physics for nonscience majors. I rely on printed handouts to communicate with you about homework, exams, etc. Printed materials will always be available in discussion or at my office. I will also send you email messages once the course gets going.

First, fill out and leave in the Physics Department Office the single blue sheet with your name, email address, phone number, and other important information. I must have this now! Also pick up the information on how to get an email account, which you must have for this course. (Call me if this is a problem, and we'll work out some alternative.) The gray part of this first packet tells you the schedule and basic facts about this course, including a sheet to remind you of important dates. The blue part is your first homework assignment.

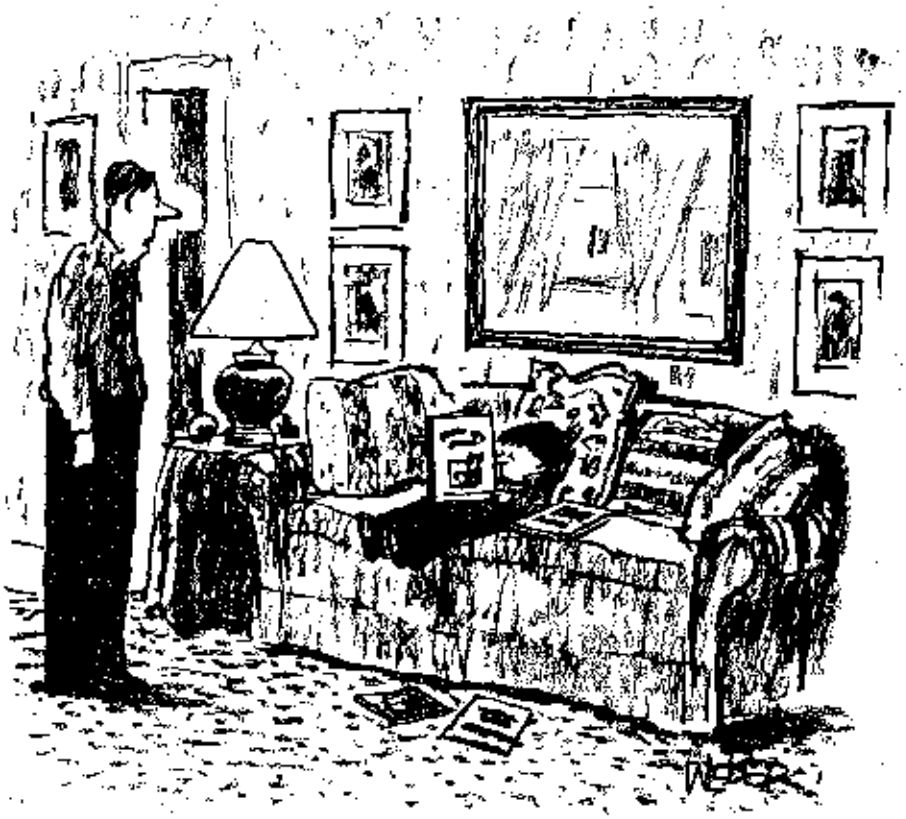
I hope I can get to know many of you. Please come to discussions, one or more per week, and don't be shy about asking questions. Also, I will answer telephone and email questions promptly. A good rule on this campus is to always start by clearly telling your name. Now: read on! Everything I could think of about the course follows.

COLOR CODING FOR HANDOUTS

Gray—Course information
Gold or White—Special announcements
Buff—Supplementary reading material
Blue—Homework assignments
Yellow—Homework solutions
Green—Review sheets for exams
White—Exams
Pink—Exam solutions, Grades

TODAY'S HANDOUTS

1-page blue to hand in now
3-page gray information
1-page white email information
2-page blue homework
1-page gray summary schedule



"Timothy, if you never watch TV you'll never know what's going on in the world."