

107-TV FALL 1997 SYLLABUS

NOTE: Each week's television lectures are broadcast from 3am-6am the previous Friday to allow videotaping in batches.

<i>Week</i>	<i>Lec</i>	<i>Date</i>	<i>Subject</i>	<i>Take notice!</i>
UNIT 1: CLASSICAL PHYSICS				
1	1	W Sep 3	The Earliest Science: Seasons and the Moon	Print Web materials!
	2	F Sep 5	Demystifying the Heavens: Tycho, Kepler, Galileo	
2	3	M Sep 8	Two Leaps of Logic: Galileo	
	4	W Sep 10	Falling Motion: Galileo's Kinematics	Last day to drop w/o record
	5	F Sep 12	Three Great Principles: Galileo	Last day to add
3	6	M Sep 15	Conservation of Momentum: Descartes and Huygens	
	7	W Sep 17	Three Great Laws of Motion: Newton's Dynamics	HW 1A and Surveys DUE
	8	F Sep 19	The Universal Law of Gravitation: Newton	
4	9	M Sep 22	Conservation of Energy	HW 1A back
	10	W Sep 24	Electric & Magnetic Forces & Fields: Coulomb, Ampère, & Faraday	
	11	F Sep 26	The First Unified Field Theory: Maxwell	END OF UNIT 1
UNIT 2: WAVES AND RELATIVITY				
5	12	M Sep 29	Waves: Simple Behavior of a Simple System	
	13	W Oct 1	Sound: Mechanical Waves in a Medium	HW 1B DUE
	14	F Oct 3	Light: Electromagnetic Waves in a Field	Rosh Hashanah Oct 2
6	15	M Oct 6	Chaos: Complex Behavior of a Simple System	HW 1B back
	Rev	M Oct 6	REVIEW SESSION, 7:00-8:30 pm, 1300 Sterling	Use Review Sheet 1
	Ex	T Oct 7	EXAM ON UNIT 1 (Lecs 1-11), 7:15-9:15 pm, Rooms 1300, 1313 Sterling, 1 page notes allowed	EXAM 1
	16	W Oct 8	Light Waves are Different: the Famous Missing Gamma Factor	
	17	F Oct 10	The Two Postulates of Special Relativity: Einstein	Yom Kippur Oct 11
7	18	M Oct 13	Gedanken Experiments on Simultaneity and Length	Exam 1 back
	19	W Oct 15	Gedanken Experiments on Clocks and Time	HW 2A DUE
	20	F Oct 17	Spacetime: Gamma Factor Effects and Time as the 4th Dimension	
8	21	M Oct 20	Spacetime Diagrams	HW 2A back
	22	W Oct 22	$E=mc^2$: Energy and Mass are Equivalent	
	23	F Oct 24	$E=mc^2$: Bombs, Stars, and Reactors	
9	24	M Oct 27	Relativity in Action: Big Gamma Factors	
	25	W Oct 29	The Equivalence Principle: Einstein	HW 2B DUE
	26	F Oct 31	Curved Spacetime: Physics is Math	Last day to drop
10	27	M Nov 3	Big Bang Cosmology	HW 2B back

28 W Nov 5 Black Holes and Dark Matter in the Universe: "Seeing" the Very Large **END OF UNIT 2**

UNIT 3: QUANTUM PHYSICS

29 F Nov 7 Atoms, Electrons, and Nuclei: "Seeing" the Very Small **HW 2C DUE**

11 30 M Nov 10 The Quantum Physics of Light: Planck, Spectra of Solids **HW 2C back**

Rev M Nov 10 **REVIEW SESSION, 7:00-8:30 pm, 1300 Sterling** **Use Review Sheet 2**

Ex T Nov 11 **EXAM ON UNIT 2 (Lecs 12-28), 7:15-9:15 pm, Rooms 1300, 1313 Sterling, 1 page notes allowed** **EXAM 2**

31 W Nov 12 Waves are Particles: Einstein, the Photoelectric Effect

32 F Nov 14 The Quantum Physics of Matter: Bohr, the Hydrogen Atom

12 33 M Nov 17 Particles are Waves: deBroglie, Schrödinger, and Born **Exam 2 back**

34 W Nov 19 The Uncertainty Principle: Heisenberg **Print Unit 3 notes!**

35 F Nov 21 Quantum Physics in Action: Superconductivity **HW 3A DUE, Last Day to Withdraw**

13 36 M Nov 24 Quantum Physics in the Sky: Sunsets, Ozone, Greenhouse Effect

37 W Nov 26 Quantized Energy Levels: Lasers and Atomic Clocks

Hol F Nov 28 **THANKSGIVING BREAK, NO LECTURE FRI**

14 38 M Dec 1 Quantum Electronics and Computer Chips **HW 3A back**

39 W Dec 3 Quantum Field Theory: Feynman's Dynamics

40 F Dec 5 Nature's Building Blocks: Particles, Quarks, and Leptons

15 41 M Dec 8 The Four Forces: Gauge Bosons

42 W Dec 10 Inner Space/Outer Space: Particle Physics Meets Cosmology

43 F Dec 12 The Nobel Prize: Tracing the Ideas of Modern Physics, Course Evaluation done by Web Surveys **HW 3B and Surveys DUE; END OF UNIT 3**

EXAM WEEK

16 Rev W Dec 17 **REVIEW SESSION, 7:00-8:30 pm, 1300 Sterling** **HW 3B back, Use Review Sheet 3**

Ex R Dec 18 **EXAM ON UNIT 3 (Lecs 29-43), 12:25-2:25 pm, Rooms 1300, 1313 Sterling, 1 page notes allowed**

Gr F Dec 19 **Final Grades finished, noon, 4205 Chamberlin** **Grades**

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Please email any questions, comments, or suggestions to Professor Bernice Durand, bdurand@theory3.physics.wisc.edu.

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