Physics 471 Class Schedule – Winter 2012 – Revised

	Monday	Tuesday	Wednesday	Thursday	Friday
January	2 **Holiday**	3	4 Lecture 1: Vector Calculus Reading: 0.1; syllabus; "What you should already know" handout	5	6 Lect.2: Maxwell Eqns Reading: 1.1-1.3
	9 Lect.3: Maxwell Eqns, cont. Reading: 1.4-1.5	10 HW 1	11 Lect.4: Materials, Wave eqn Reading: 1.6-1.7	12 HW 2	13 Lect.5: Complex numbers/ Plane waves/Index of refr. Reading: 0.2, complex numbers handout, 2.1-2.2
	16 **Holiday**	17 HW 3	18 Lect.6: Lorentz model Reading: 2.3	19 HW 4	20 Lect.7: Cond./Poynting/Irrad. Reading: 2.4-2.6
	23 Lect.8: Refraction/Reflection Reading: 3.1-3.3	24 HW 5	25 Lect.9: Brewster/T.I.R./metal Reading: 3.4-3.6	26 HW 6	27 Lect.10: Double interfaces Reading: 4.1
February	30 Lect.11: Interfaces at angles Reading: 4.2-4.3	31 HW 7	1 Lect.12: Fabry-Perot Reading: 4.4-4.6	2 HW 8	3 Lect.13: Multilayers Reading: 0.3, 4.7-4.8
	6 Lect.14: Light in crystals Reading: 5.1-5.2	7 HW 9	8 Lect.15: Uniaxial crystals Reading: 5.3-5.5	9 HW 10	10 HW 11; Lect.16: Exam 1 review **Begin Exam 1 (Ch 1-5)**
	13 Lect.17: Polarization states Reading: 6.1-6.3	14 (no HW) **End Exam 1**	15 Lect.18: Jones matrices Reading: 6.4-6.6	16 HW 12	17 Lect.19: Polar. & reflect/transm Reading: 6.7
	20 **Holiday**	21 L20: Group velocity Reading: 7.1-7.2	22 Lect.21: Fourier Theory/ Frequency Spectrum Reading: 0.4, 7.3	23 HW 13	24 Lect.22: Delta func./Convolution Reading: Delta function handout, Convolution handout
	27 Lect.23: Group delay (substitute) Reading:7.4-7.5 (skipping 7.6)	28 HW 14	29 Lect.24: Michelson/Temporal coherence (substitute) Reading: 8.1-8.2	1 HW 15	2 Lect.25: Visibility/Fourier Spectr. Reading: 8.3-8.4
March	5 Lect.26: Spatial coherence Reading: 8.5	6 HW 16	7 HW 17; Lect.27: Exam 2 review **Begin Exam 2 (Ch 6-8)**	8 (no HW)	**9** Lect.28: Rays Reading: 9.1-9.3 **Exam 2 ends Saturday night**
	12 Lect. 29: ABCD matr./Imaging Reading: 9.4-9.6	13 (no HW)	14 Lect.30: Complex imaging Reading: 9.7-9.8	15 HW 18	16 Lect.31: Aberrations Reading: 9.A
	19 Lect.32: Diffraction Reading: 10.1-10.3	20 HW 19	21 Lect.33: Fraunhofer approx. Reading: 10.4	23 HW 20	23 Lect.34: Array Thm/Gratings/ Spectrometer Reading: 11.3-11.5
	26 Lect.35: Cylindrical apertures Reading: 10.5 & Bessel functions handout	27 HW 21	28 Lect.36: Diffraction through lens Reading: 11.1-11.2	29 HW 22	30 HW 23*; L.37: Gaussian Beams Reading: 11.6-11.7, 11.A *HW 23 is due Saturday night
April	2 HW 24; Lect.38: Exam 3 review **Begin Exam 3 (Ch 9-11)**	3 (no HW)	4 Lect.39: Blackbody Radiation Reading: 13.1-13.3	5 (no HW)	6 Lect.40: Einstein A & B/Lasers Reading: 13.4 **End Exam 3**
	9 Lect.41: Color Reading: 2.A	10 HW 25	11 HW 26; Lect. 42: Color, cont. Reading: none	12 **Reading Day**	13 **Reading Day extra-credit papers due**

Homework assignments are due at 11 pm (building close), except for HW 11,17,24. Each problem is worth 4 pts unless otherwise indicated.

Exam 1 Assignments

1. P0.1; P0.6; P1.1; L1.10 (8 pts)
2. Colton 1; P1.3; P1.4; P1.11
3. P1.9 (8 pts); P0.14; P0.20; Colton 2
4. Colton 3; P2.2; P2.3 (8 pts); P2.4
5. P2.5; P2.6 (I didn't use the specified equations at all; I think there are typos in the book); P2.7; P2.8
6. P2.10; P3.1 (just derive the far right form of the eqns); P3.3 (6 pts); L3.4 (8 pts)
7. P3.12; P3.14 (additionally, make a plot of R_p); P3.15; P4.2; P4.4
8. P4.6; L4.7 (6 pts); P4.8; P4.9
9. P4.10; P4.13 (6 pts); P4.17 (6 pts); P4.18 (6 pts)
10. P5.2; P5.6 (6 pts); L5.7 (6 pts)
11. One problem from R19-R28 (8 pts) – special sign up & due time

Exam 2 Assignments

12. L6.3; P6.5 (2 pts)
13. P6.6; L6.9; P6.11; P0.24 (2 pts); P0.25 (2 pts)
14. P0.26(b); P0.28 (6 pts); Colton 4; P7.5
15. P7.6; P7.7; P7.8; P8.2
16. P8.3; P8.4 (for your plot, let $\omega_0 = 1$, $\Delta\omega = 0.1$, and have τ go between -100 and +100); P8.7; L8.8 (6 pts); P8.9
17. One problem from R42-R47 (8 pts) – special sign up & due time

Exam 3 Assignments

18. P9.5; P9.8
19. P9.11 (I used Mathematica to solve the four simultaneous eqns); P9.12; L9.13; P9.14
20. P9.15 (6 pts); L9.17; P10.1; P10.2 (6 pts)
21. P10.6 (6 pts; don't do the "make suitable approximations…" part. Hint: "on axis" means $\rho = 0$. Also note that $J_0(0) = 1$.); P10.9; Colton 5; P11.7 (you can use Eqn 11.28)
22. P11.8; Colton 6 (lab; 6 pts); L11.10; Colton 7 (lab; 2 pts)
23. P11.5 (6 pts; d is the distance to the screen); Colton 8 (6 pts); Colton 9 (lab; 6 pts); P11.15
24. One problem from R68-R74 (8 pts) – special sign up & due time

Assignments after exam 3

25. P13.4; Colton 11; Colton 12; Colton 13 (6 pts)
26. Colton 14 (6 pts); Colton 15; P2.13, but use the function $I(\lambda) = I_0 e^{-((\lambda - 500\,\text{nm})/(20\,\text{nm}))^2}$ instead of the given $I(\lambda)$. Hint: in Mathematica you can create a function from a two-column file of numbers like this: X=Interpolation[Import["c:/xfile.csv"]];