Grande Prairie Regional College

Department of Science and Technology

PC 1300 – Waves, Sound and Optics
Fall 1998
U of A Equivalent – Physics 130

Course Outline

Instructor	Jaime P. Santiago J209, 539-2865 santiago@gprc.ab.ca		
Lecture	M TR	2:00 – 2:50 p.m. 9:30 – 10:20 a.m.	Room J228 Room J226
Laboratory	T	3:00 – 5:50 p.m.	Room J226
Topics Covered	Oscillations and waves; sound; the wave nature of light, geometrical and physical optics		
Textbook	Fundamentals of Physics, 5th Edittion by David Halliday, Robert Resnick and Jearl Walker John Wiley & Sons, Inc.		
Laboratory Manual	Physics Laboratory Manual by Department of Physics, University of Alberta McGraw-Hill Ryerson		
Mark Distribution	Laboratory Work Problem Sets Midterm Exam Final Exam	20% 20% 20% 40%	

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Problem Sets

There are 11 problem sets assigned. The last problem set is for practice purposes only and will not be marked. Due dates for the first 10 problem sets are indicated in the class schedule. Problem sets are worth 20% of the final mark. No late assignments will be accepted.

Laboratory Work

Laboratory experiments are performed every other week alternating with chemistry labs. There is no lab midterm exam. The lab final exam is equivalent to one experiment. Laboratory work is worth 20% of the final mark.

Printed group lab reports are due 1 week after the lab is performed. Reports must be in Microsoft Word and Excel format.

Students are expected to attend all laboratory periods. Absences due to illness must be substantiated by presenting suitable evidence to the Instructor/Lab Technician. An opportunity to make-up a lab will be given only for excused absences.

A student must pass the lab component of the course in order to pass the whole course.

Midterm Exam

The midterm exam is worth 20% of the final mark. Please refer to the class schedule when the exam will be written. Failure to write an exam is covered by a college policy. Please refer to your college calendar.

Final Exam

The final exam is worth 40% of the final mark. Please refer to your college calendar for the college policy on final examinations.

Problem Sets

Set No.	Chapter	Problems
1	16	23P, 25P, 30P, 48P, 89P
2	17	8E, 28P, 32P, 35P, 38P
3	17	42P(note: there are two answers to the problem), 46E, 56P, 57P, 66P
4	18	11P, 18P, 21P, 26P, 43P
5	18	54P, 58P, 60P, 63P, 79P
6	34	53P, 65P, 70P, 82P, 83P
7	35	12P, 13P, 16P(this problem is worth 2x), 17P
8	35	21P, 23P, 36P, 38P, 39P
9	36	10P, 15P, 22E, 28P, 34P
10	36	39P, 41P, 54P, 62P, 70P
11	37	17P, 23E, 43P, 52P

Course Schedule

Date	Day	Chapter	Topic	Problem Set Due	Laboratory
02-Sep-98	W		Fall session begins		
03-Sep-98	R	16	Course introduction; Qualitative description of simple harmonic motion (SHM)		
07-Sep-98	M		Labour Day		
08-Sep-98	T	16	Position, velocity and acceleration in simple harmonic motion; SHM and uniform circular motion		
10-Sep-98	R	16	The force law in SHM		
14-Sep-98	M	16	Energy in SHM; the torsion pendulum		
15-Sep-98	T	16	The simple pendulum, physical pendulum, moment of inertia		Lab 1: Oscillations of a Spring
17-Sep-98	R	16	Damped oscillations, forced oscillations and resonance		
21-Sep-98	M	17	The wave concept, types of waves, wavelength, frequency, speed of wave	Problem Set 1	
22-Sep-98	T	17	Waves on a stretched string, energy and power		Lab 1: Oscillations of a Spring
24-Sep-98	R	17	Superposition principle, interference of waves		
28-Sep-98	M	17	Phasors	Problem Set 2	
29-Sep-98	T	17	Standing waves and resonance		Lab 2: Standing Waves on a String
01-Oct-98	R	18	Sound waves, speed of sound		
05-Oct-98	M	18	Traveling sound waves	Problem Set 3	
06-Oct-98	T	18	Interference of sound waves		Lab 2: Standing Waves on a String
08-Oct-98	R	18	Intensity and sound level		
12-Oct-98	M		Thanksgiving Day		
13-Oct-98	T	18	Sources of musical sound; Beats	Problem Set 4	
14-Oct-98	R		Midterm Exam		
19-Oct-98	M	18	The Doppler effect		
20-Oct-98	T	34	Light as a wave, electromagnetic spectrum, speed of light, index of refraction		Lab 3: Speed of Sound in Air
22-Oct-98	R	34	Variation of intensity with distance, radiation pressure, polarization		
26-Oct-98	M	34	Reflection and refraction	Problem Set 5	
27-Oct-98	T	34	Snell's Law; chromatic dispersion		Lab 3: Speed of Sound in Air
29-Oct-98	R	34	Total internal reflection; polarization by reflection		
02-Nov-98	M	35	Plane and spherical mirrors	Problem Set 6	
03-Nov-98	T	35	Spherical mirrors		Lab 4: Geometrical Optics
05-Nov-98	R	35	Spherical mirrors		
09-Nov-98	M	35	Spherical refracting surfaces	Problem Set 7	
10-Nov-98	T	35	Thin lenses		Lab 4: Geometrical Optics
12-Nov-98	R	35	Thin lenses		
16-Nov-98	M	35	Optical instruments	Problem Set 8	
17-Nov-98	T	36	Interference and diffraction		Lab 5: Interference of Light
19-Nov-98	R	36	Coherence; Young's experiment		
23-Nov-98	M	36	Intensity in double slit	Problem Set 9	
24-Nov-98	T	36	Thin films		Lab 5: Interference of Light
26-Nov-98	R	37	Single slit diffraction		
30-Nov-98	M	37	Intensity in single slit diffraction	Problem Set 10	
01-Dec-98	T	37	Diffraction by circular aperture		Lab Test
03-Dec-98	R	37	Diffraction by double slit, multiple slits; the diffraction grating		
04-Dec-98	F		Last day of fall classes		