

GRANDE PRAIRIE REGIONAL COLLEGE  
ACADEMIC UPGRADING DEPARTMENT

SEP. 05 2002

PHYSICS 0120  
COURSE OUTLINE  
FALL AND WINTER SEMESTER 2002 – 2003

**INSTRUCTOR:** Nancy Fraser

**OFFICE:** J - 216

**PHONE NUMBER:** 539-2980

**COURSE GOALS:** This course is designed to give the student an understanding of some basic concepts and principles of physical science involving heat, gases, and water, sound and light waves. The student will develop problem solving skills and gain an appreciation of the role of physics in modern society.

**FORMAT:** This course will be mainly lectures. There will also be a lab component and problem sessions.

**ATTENDANCE  
POLICY:**

Regular attendance is expected of all students, and is crucial to passing the course. Students who miss classes will soon find themselves falling behind and failing. Lateness will not be tolerated as it interrupts the instructor and fellow classmates.

If a student is going to miss a test or midterm he/she **must** contact the instructor prior to the test or midterm in order to be considered for a rewrite. Laboratory attendance to each specific experiment is compulsory. There are NO 'makeup' labs in this course. Missed labs will result in a grade of 0 %.

**OFFICE HOURS:** I will post office hours. If the posted times do not fit with your schedule alternate times can be arranged. **IF YOU ARE HAVING TROUBLE COME FOR HELP IMMEDIATELY!**

**EVALUATION:** Lab reports must be submitted on the required date and at the required time.

Penalties for late assignments are as follows:

1 day late – 20%, 1 days late – 50%, 3 days late – 0%

Penalties for late labs are as follows:

5 minutes after due time - 10 %, 24 hours after due time - 0%

Your final mark will be based on:

assignments	15%
labs	15%
*2 midterms	20%
tests	10%
1 Final Exam	<u>40%</u>
Total	100%

\* There will be two 'midterm' exams. One at the end of Unit 2 and the second at the end of Unit 5.

\*\* The final exam will be based on all the material after the first midterm.

### COURSE CONTENT:

#### Unit 1: Kinematics:

- |       |   |                    |
|-------|---|--------------------|
| i)    | vectors: resultant - components of a vector,  | 63 - 68, 72 - 77   |
| ii)   | relative velocity.  | 78 - 83            |
| iii)  | motion in two dimensions  |                    |
| iv)   | projectile motion.  | 83 - 91            |
| vi)   | balanced and unbalanced forces - net force  | 99 - 114, 116, 120 |
| vii)  | motion along an incline plane (including friction)  | 122 - 128          |
| viii) | work done in moving a load on an incline plane when the force is parallel to the incline. | 138 - 141          |

#### Unit 2: Circular Motion and Gravitation:

- |      |   |           |
|------|---|-----------|
| i)   | centripetal acceleration and centripetal force                      | 217 - 224 |
| ii)  | derive the related formulae   |           |
| iii) | circular motion in horizontal and vertical planes (as time permits) |           |

iv)	Kepler's three laws	235 – 238
v)	Newton's law of gravitation	227
vi)	planetary and satellite motion, period of a satellite, weight in space (as time permits)	"
vii)	mass of a planet from satellite from satellite data. (as time permits)	"

\* **Midterm I**

**Unit 3: Gases:**

i)	Kinetic molecular theory	348
ii)	Charles' law	338
iii)	Boyle's law	"
iv)	Combined gas law	"

**Unit 4: Waves:**

i)	Hooke's law and simple pendulum	418 – 420
ii)	Simple harmonic motion	"
iii)	Water waves and transverse waves	432 – 434
iv)	Reflection of water waves	439
v)	Refraction of water waves	"
vi)	Diffraction of water waves	439
vii)	Interference and principle of superposition.	437 – 439, 440 – 441

**Unit 5: Sound: (Chapter 14)**

i)	Longitudinal waves and nature of sound	434 – 455
ii)	Mach number	
iii)	Intensity and loudness	458 – 463
iv)	Reflection and Acoustics	463 – 464
v)	Refraction	"
vi)	Diffraction	"
vii)	Interference: Two point source	464 – 465
	Beats	466 – 467
	Herschel tube	
viii)	Mode of vibration and quality of sound:	
	Fundamental frequency	440 – 445
	Harmonics and overtones	440 – 445
	String laws	
ix)	Resonance	440 – 445

x)	Open and closed air columns	473 – 475
xi)	Doppler effect	467 – 470
xii)	Huygens' principle	690
xiii)	Supersonic velocities and the sound barrier	471 – 473

\* **Midterm 2**

**Unit 6: Light:**

i)	Sources of light	
ii)	Properties of light	
iii)	Wave-Particle duality	
iv)	Speed of light: Roemer's experiment Michelson's experiment	
v)	Pinhole camera	
vi)	Reflection, absorption, and transmission	688 – 690
vii)	Mirrors and spherical aberration	710 – 723
viii)	Refraction: Snell's law	690 – 695
	Critical angle	698 – 699
	Total internal reflection	"
	Rectangular prism (If time)	
	Apparent depth	696
ix)	Atmospheric refraction	"
x)	Lenses and spherical aberration	724 – 733
xi)	Lens maker equation (if time)	733 – 734
xii)	Interference: Young's double slit experiment	742 – 745
	Coherent light	
	Thin films	745 – 749
	Newton's rings	748 – 749
xiii)	Diffraction and diffraction gratings	750 – 747
xiv)	Polarization	757
xv)	Spectroscopy: Continuous, emission and absorption spectra	850 – 855, 653

Required Text:

**College Physics by Wilson (1980, 1984, and 1990 editions)**

Supplementary texts:

1. Elements of Physics by Smith and Copper (1979)
2. Physics: Principles and Problems, by Zitzewitz (any edition)
3. Modern Physics by Trenklein (1990, and 1994)