

# Physics 20 Course Outline

## Instructor

Mr. B. Loewen

## Texts

The required textbook for this section of Physics 20 is Merrill Physics, Principles and Problems. Another book, which is strongly recommended, is the Physics 20 Notes & Problems Wayne Ladner, 2002. It is available from the office for about \$9.

## Pre-requisites

The pre-requisite for Physics 20 is Science 10. NOTE: A minimum mark of 65% in Physics 20 is recommended to take Physics 30.

## Units

Review	Science 10 Physics material	1 week
Unit I	Kinematics & Dynamics	7 weeks
Unit II	Circular Motion & Gravitation	4 weeks
Unit III	Mechanical Waves	3 weeks
Unit IV	Light (Mirrors & Lenses)	4 weeks
Review	Physics 20	1 week

## Evaluation

➤ Each Unit will consist of:

Labs-Actual & Virtual-worth 30% of the Unit mark  
Quizzes & Tests-worth 20% of the Unit mark  
Homework-worth 20% of the Unit mark  
Unit Final-worth 30% of the Unit mark



These cumulative Unit marks are then combined to make up 65% of the total course mark

Course work throughout the semester	65%
Final Exam	35%
Total	100%

### Homework

Homework and Lab Reports must be completed as assigned. Marks may be allotted for completed work and lost for incomplete work.

- Late assignments will be penalized 10% per 24hrs(or any portion thereof) when handed in after the assignment is due.

### Absences

- Unexcused absences for missed quizzes/tests/exams/assignments are assigned zero.
- Excused absence means you can make-up what you missed, but this must be done within 1 week of your return to school and the work you complete may be a modified version of the work completed by the rest of the class.
- An excused absence requires a medical or parental note.
- Missed tests/exams require prior notification in the form of a parental note unless due to illness/injury.
- ***It is the responsibility of the student - not the teacher - to follow up on missed assignments/quizzes/exams/homework/etc***

### Other Policies and Expectations

- You must bring your own supplies and textbook(s) to class every day.
- No cell phones or PDAs in class (on or off). No other electronic devices during quizzes/tests/exams or lecture time. Calculators will be cleared. Calculators, which cannot be cleared, cannot be used. Any game playing on calculators will result in confiscation of calculator until games can be erased.
- All lab reports and assignments must be completed in a neat and organized manner. Messy or unorganized work may be returned to be redone in an appropriate fashion
- Homework checks for marks will occur randomly.
- Any form of communication during a test is considered cheating. Any form of assistance on a test which the entire class does not have access to is considered cheating. See your Student Handbook for SHS policy on cheating.
- No washroom breaks while the class is in session. Go before or after - not during.
- If a quiz or assignment has been started when you arrive late for class, you will still be expected to complete the work at the same time as the rest of your class.
- No food or drinks in the Physics class at any time.
- Unsafe behaviour in the class or lab will be dealt with severely.

In an effort to maintain the reputation of being polite and courteous to fellow students and teachers, students are reminded of Section 12 of the Alberta School Act (2000), Section 12.

“A student shall conduct himself so as to reasonable comply with the following code of conduct:

- a) be diligent in pursuing his studies.
- b) attend school regularly and punctually.
- c) co-operate fully with everyone authorized by the board to provide education and other services.
- d) comply with the rules of the school.
- e) account to his/her teachers for his/her conduct.
- f) respect the rights of others.”



## OVERVIEW OF REQUIRED PORTIONS OF COURSE

### 1) Kinematics & Dynamics

#### ***Kinematics in One Dimension (Linear):*** pages 1-61

Introduction to Physics, units of measurement, accuracy and percentage error, significant digits, graphing data, uniform motion, uniform accelerated motion, gravity, freely falling objects, graphical analysis of motion, slope, area under curves.

#### ***Kinematics in Two Dimensions:*** pages 63-89

concept of a vector, vectors diagrams, components and resultant vectors, projectile motion, objects thrown horizontally or at an angle.

#### ***Dynamics:*** pages 90-132

Newton's First Law of Motion - forces, vectors, net force, Newton's Second Law of Motion - force due to gravity (weight), normal force, force due to friction, tension, free body diagrams, Newton's Third Law of Motion - energy, work power, work-energy theorem, potential and kinetic energy, conservation of mechanical energy.

### 2) Circular Motion and Gravitation:

 pages 133-165

uniform circular motion, vertical circular motion, banked curves, Kepler and planetary motion, Newton and universal gravitation, concept of fields, gravity, launching satellites and satellites in orbit,

\*\*\* exclude angular motion sections on pages 166-171

### 3) Mechanical Waves:

 pages 177-211

simple harmonic motion, Hooke's Law for springs, pendulums, conservation of energy applications in pendulums and springs, waves as a transfer of energy, longitudinal and transverse waves, properties of waves, sound as a wave, behaviour of waves at boundaries, reflection, refraction, diffraction, interference.

\*\*\* parts of "sound" sections on pages 213-230 will be used as extensions

### 4) Light:

 pages 239-304

historical debate on the structure of light (wave vs. particle), properties of light, behaviour of light at boundaries: reflection and refraction, ray diagrams, mirrors and lenses - geometric optics, speed of light, the visible light spectrum - ROYGBIV, color mixing, the electromagnetic spectrum, polarization

\* relativity - what happens when we approach "c", Einstein and  $E = mc^2$