

## EASTERN SCHOOL DISTRICT

### Course Description

(June 2, 2006)

**Course:** Physics 2204

**Subject Area:** Science

**Text:** Irwin Physics

#### **Description:**

This course is common to all four Atlantic Provinces and is intended to further their study of physics, building on Science 1206. Core topics Kinematics, Dynamics, Work & Energy, and Waves. Each unit contains specific Core Laboratory Activities and Science, Technology, Society, and Environment (STSE) activities.

#### **Sequencing:**

Physics 2204 will be completed in the following sequence.

#### **Unit 1: Kinematics**

25 hours

- 1) Vector representation of position, displacement, velocity, and acceleration.
- 2) Graphical representation of position, displacement, velocity, and acceleration.
- 3) Mathematical representation of position, displacement, velocity, and acceleration.
- 4) Frames of Reference for fixed frames, and moving frames.

Core Lab 1: *Acceleration due to Gravity*

Core STSE 1: *Physics of Tailgating*

#### **Unit 2: Dynamics**

30 hours

- 1) Forces (*Vector Representation, Vector Decomposition, Free Body Diagrams*)
- 2) Newton's Law of Motion (*Newton's First Law, Newton's Second Law, Newton's Third Law*)
- 3) Frictional Forces (*Gravitational Forces, Normal Force, Static & Kinetic Friction*)
- 4) Momentum and Impulse (*Law of Conservation of Momentum, Impulse, Elastic & Inelastic Collisions*)

Core Lab 2: *Newton's Second Law*  
 Core Lab 3: *Kinetic Friction*  
 Core Lab 4: *Linear Momentum*  
 Core STSE 2: *The Physics of Karate*

### Unit 3: Work and Energy

25 hours

- 1) Work (*Force and Distance, Power & Time*)
- 2) Energy (*Gravitational, Kinetic, Elastic*)
- 3) Conservation of Energy (*Potential & Kinetic, Potential, Kinetic & Work*)

Core Lab 5: *Work Energy Theorem*  
 Core Lab 6: *Conservation of Energy*  
 Core STSE 3: *The Physics of Bungee Jumping*

### Unit 4: Waves

30 Hours

- 1) Characteristics (*Transverse, Longitudinal, Energy*)
- 2) Interference (*Constructive, Destructive, Superposition*)
- 3) Universal Wave Equation
- 4) Light (*Reflection, Refraction, Diffraction, Doppler Effect, Snell's Law, Single & Double Slit Interference Patterns*)
- 5) Sound (*Production & Transmission, Media, Mach Numbers, Sound Intensity Levels, Doppler Effect, Standing Wave Pattern, Interference and Reflection*)

Core Lab 7: *Snell's Law*  
 Core Lab 8: *Speed of Sound*  
 Core STSE 4: *The Physics of Guitars*

### Evaluation Guidelines:

Summative evaluation of students in Physics 2204 shall utilize a variety of evaluation instruments. Primarily, these are designed to test students' basic knowledge of content, their understanding and ability to apply content, and ability to synthesize and problem solve (higher thinking skills) with respect to the content.

Summative evaluation of students in science courses must involve a variety of evaluation instruments. **Midyear examinations, final examinations, and unit tests/quizzes**, completed by students are traditional instruments which must be a part of any summative student evaluation scheme. As well, **Performance Assessment** instruments shall be used for a portion of the summative evaluation.

**Unit Tests/Quizzes:**

All unit tests are based on the learning outcomes of the course and the objectives. The tests include a variety of testing techniques such as multiple choice and essay items. There is at least one test after each unit and sometimes the unit can be broken into several sections for the purpose of testing if the teacher deems it necessary. Each test is designed for completion in a single class period.

**Performance Assessment:**

Performance assessment instruments shall be used for a portion of the summative evaluation. *Examples of performance assessment instruments are assignments, written homework, science fair, class observations, science projects, laboratory reports, in-class presentation, in-class cooperative education, practical laboratory tests, observation checklist, computer assisted evaluation and teacher-student interviews, research reports, field trip reports, portfolios, etc.*

Teachers can determine the performance assessment instruments used in Physics 2204. However, a variety of instruments shall be used to accurately assess students' understanding of learning outcomes, with a focus on core labs and STSE topics.

**Cumulative Midyear Examination:**

The mid-year examination tests all course objectives to that point. It will include multiple choice, essay items and short answer questions on elective units. The test is designed to be completed in a 2 hour time period.

**Final Examination:**

The final examination is based on the course objectives for the entire year. It uses the same testing techniques used in the mid-year examination. The test is designed to be completed in a 2 hour time period.

**Weighting of Evaluation Component:**

Tests/Quizzes	25%
Performance Assessment	20%
Comprehensive Midyear Exam	20%
Final Examination	35%

**Notes:**

- 1) To parallel the evaluation for Physics 3204, performance assessments in Physics 2204 should primarily focus on STSE and core lab outcomes.
- 2) Student grades for the November reporting period comprised of results obtained from tests/quizzes (80%) and Performance Assessment (20%).

**Table of Specifications:**

A Table of Specifications is used for two main reasons. First, it guides the construction of examinations by outlining a percent value for each cognitive level and unit of study. Secondly, the total percentage for each unit directly corresponds to the suggested time for teaching that unit.

Unit	Cognitive Level %			
	1	2	3	Total %
Kinematics	5	13	5	23
Dynamics	5	17	5	27
Work and Energy	5	13	5	23
Waves	5	17	5	27
<b>Total %</b>	<b>20</b>	<b>60</b>	<b>20</b>	<b>100</b>

***The evaluation instrument will contain 15-20% of core lab and STSE (Science, Technology, Society, and the environment) content.***

**Final Examination Blue Print:** (Follows format of public exam)

A) Selected Response:

Unit	Number of Selected Response Questions			
	1	2	3	Total #
Kinematics	5	4	3	12
Dynamics	5	5	3	13
Work and Energy	5	4	3	12
Waves	5	5	3	13
<b>Total %</b>	<b>20</b>	<b>18</b>	<b>12</b>	<b>50</b>

B) Constructed Response Blue Print:

Unit	Number of Marks			
	1	2	3	Total #
Kinematics	0	9	2	11
Dynamics	0	12	2	14
Work and Energy	0	9	2	11
Waves	0	12	2	14
<b>Total %</b>	<b>0</b>	<b>42</b>	<b>8</b>	<b>50</b>