

**R.H. KING ACADEMY SCIENCE DEPARTMENT
COURSE OUTLINE AND EVALUATION
GRADE 12 UNIVERSITY PHYSICS**

COURSE OVERVIEW

This course enables students to deepen their understanding of physics concepts and theories. Students will continue their exploration of energy transformations and the forces that affect motion, and will investigate electrical, gravitational, and magnetic fields and electromagnetic radiation. Students will also explore the wave nature of light, quantum mechanics, and special relativity. They will further develop their scientific investigation skills, learning, for example, how to analyse, qualitatively and quantitatively, data related to a variety of physics concepts and principles. Students will also consider the impact of technological applications of physics on society and the environment.

TOPICS OF STUDY

Dynamics

In this unit students will:

- analyse technological devices that apply the principles of the dynamics of motion, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, forces involved in uniform circular motion and motion in a plane, and solve related problems;
- demonstrate an understanding of the forces involved in uniform circular motion and motion in a plane.

Energy and Momentum

In this unit students will:

- analyse, and propose ways to improve, technologies or procedures that apply principles related to energy and momentum, and assess the social and environmental impact of these technologies or procedures;
- investigate, in qualitative and quantitative terms, through laboratory inquiry or computer simulation, the relationship between the laws of conservation of energy and conservation of momentum, and solve related problems;
- demonstrate an understanding of work, energy, momentum, and the laws of conservation of energy and conservation of momentum, in one and two dimensions.

Gravitational Electric and Magnetic Fields

In this unit students will:

- analyse the operation of technologies that use gravitational, electric, or magnetic fields, and assess the technologies' social and environmental impact;
- investigate, in qualitative and quantitative terms, gravitational, electric, and magnetic fields, and solve related problems;
- demonstrate an understanding of the concepts, properties, principles, and laws related to gravitational, electric, and magnetic fields and their interactions with matter.

The Wave Nature of Light

In this unit students will:

- analyse technologies that use the wave nature of light, and assess their impact on society and the environment;
- investigate, in qualitative and quantitative terms, the properties of waves and light, and solve related problems;
- demonstrate an understanding of the properties of waves and light in relation to diffraction, refraction, interference, and polarization.

Revolutions in Modern Physics: Quantum Mechanics and Special Relativity

In this unit students will:

- analyse, with reference to quantum mechanics and relativity, how the introduction of new
- conceptual models and theories can influence and/or change scientific thought and lead to the development of new technologies;
- investigate special relativity and quantum mechanics, and solve related problems;
- demonstrate an understanding of the evidence that supports the basic concepts of quantum mechanics and Einstein's theory of special relativity.

COURSE TEXTBOOK: Nelson Physics 12

Replacement Cost: \$90

MATERIALS REQUIRED

binder, loose leaf paper, pens, pencils, eraser, ruler, calculator, graph paper, protractor

CALCULATION OF MARKS

Your final mark in Physics will be calculated as follows:

Knowledge	18 %
Inquiry	18 %
Communication	12 %
Application/Making Connections	12 %
Projects (K, I, C, A)	10 %
Final Exam	30 %

Knowledge and Understanding

- understanding of concepts, principles, laws, and theories (e.g. identifying assumptions, eliminating misconceptions, providing explanations)
- knowledge of facts and terms
- transfer of concepts to new contexts
- understanding of relationships between concepts

Thinking and Inquiry

- application of the skills and strategies of scientific inquiry (e.g. initiating and planning, performing and recording, analysing and interpretation, problem solving)
- application of technical skills and procedures
- use of tools, equipment and materials

Communication

- communication of information and ideas: use of scientific terminology, symbols, conventions and standard (SI) units, communication for different audiences and purposes
- use of various forms of communication (e.g. reports, essays)
- use of information technology for scientific purposes

Application and Making Connections

- understanding connections between science, technology, society and the environment
- analysis of social and economic issues involving science and technology
- assessment of impacts of science and technology on the environment
- proposing courses of practical action in relation to science and technology based problems

The instruments used to evaluate your performance in science include daily class work, reports, laboratory skills and reports, independent study projects, quizzes, tests and the final examination.

CLINIC

All students can benefit by attending clinic periods when they feel they need extra help. You may be required to commit to clinic with your Physics teacher based on marks, completion of work, disciplinary needs, or teacher request.

CHEATING AND PLAGIARISM

It is expected that all students at R.H. King Academy will practice academic honesty and build this into their career philosophies. They must acknowledge any input from peers, parents and secondary sources. Information gathered from the Internet is considered a secondary source. To submit any work that is not completely their own is considered plagiarism. "Loaning" completed work to other students is considered to be cheating.

Cheating will result in a mark of zero and may result in suspension and/or loss of credit.