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

COURSE OVERVIEW

This course develops students' understanding of the basic concepts of physics. Students will explore these concepts with respect to motion; mechanical, electrical, electromagnetic, energy transformation, hydraulic, and pneumatic systems; and the operation of commonly used tools and machines. They will develop their scientific investigation skills as they test laws of physics and solve both assigned problems and those emerging from their investigations. Students will also consider the impact of technological applications of physics on society and the environment.

Prerequisite: Grade 10 Science, Academic or Applied **Credit Value:** 1.0

TOPICS OF STUDY

Motion and Its Applications

In this unit students will:

- analyse selected technologies that are used to move objects or track their motion, and evaluate their impact on society and the environment, including their contribution to scientific knowledge;
- investigate, in qualitative and quantitative terms, the linear uniform and non-uniform motion of objects, and solve related problems;
- demonstrate an understanding of different kinds of motion and the relationships between speed, acceleration, displacement, and distance.

Mechanical Systems

In this unit students will:

- analyse common mechanical systems that use friction and applied forces, and evaluate their effectiveness in meeting social or environmental challenges;
- investigate forces, torque, work, coefficients of friction, simple machines, and mechanical advantage, and interpret related data;
- demonstrate an understanding of concepts related to forces and mechanical advantage in relation to mechanical systems.

Electricity and Magnetism

In this unit students will:

- analyse the development of selected electrical and electromagnetic technologies, and evaluate their impact on society and the environment;
- investigate real and simulated mixed direct current circuits and the nature of magnetism and electromagnetism, and analyse related data;
- demonstrate an understanding of the basic principles of electricity and magnetism.

Energy Transformations

In this unit students will:

- evaluate the impact on society and the environment of energy-transformation technologies, and propose ways to improve the sustainability of one such technology;
- investigate energy transformations and the law of conservation of energy, and solve related problems;
- demonstrate an understanding of diverse forms of energy, energy transformations, and efficiency.

Hydraulic and Pneumatic Systems

In this unit students will:

- analyse the development of technological applications related to hydraulic and pneumatic systems, and assess some of the social and environmental effects of these systems;
- investigate fluid statics, fluid dynamics, and simple hydraulic and pneumatic systems;
- demonstrate an understanding of the scientific principles related to fluid statics, fluid dynamics, and hydraulic and pneumatic systems.

MATERIALS REQUIRED: binder, loose leaf paper, pens, pencils, eraser, ruler, calculator, graph paper

CALCULATION OF MARKS

Your final mark in Physics will be calculated as follows:

Tests	25 %
Labs	20 %
Quiz/Assignment	15 %
ISU	10 %
Final Exam	30 %

Student work will be assessed and/or evaluated in a BALANCED manner with respect to the FOUR categories, and that achievement of particular expectations will be considered within the appropriate categories

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

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.