COURSE OUTLINE

Course Name: Physics 2

Course Number: PHYS 1200 **Number of Credits:** 4.0 **Effective Date:** January 2016

Course Description:

This course covers the second half of a standard 1st year calculus-based physics course (PHYS 1100 is the first half). Topics include electricity and magnetism, geometric optics, physical optics and quantum physics (including radioactivity). Students will perform a number of laboratory experiments connected to these topics. In addition, students will perform six introductory engineering laboratory experiments in order to familiarize themselves with operating lab instruments such as linear power supplies, digital multi-meters, function generators and oscilloscopes. Students will also learn proper bread boarding and printed wiring board assembly techniques.

School or Centre:

School of Access

Year of Study:

1st Year Post-secondary

Course History:

Revised Course

Name of Replacing Course (if applicable):

Course Pre-requisites (if applicable):

Physics 1 (PHYS 1100)

Course Co-requisites (if applicable):

Calculus 2 (MATH 1200)

PLAR (Prior Learning Assessment & Recognition)

☒ No ☐ Yes (details below):

Instructional Strategies:

Lecture periods will emphasize an activity-based learning environment. This environment will be created through student investigation activities, problem-solving worksheets, discussion of concepts in class and interactive demonstrations. Four lab exercises will be based around topics such as wave optics, electricity and magnetism, and quantum physics. Six introductory engineering lab experiments will cover operating lab instruments such as linear power supplies, digital multi-meters, function generators and oscilloscopes.

Course Learning Outcomes:

At the end of the course the student will be able to:
-Discuss electric, magnetic and wave phenomena through the use of various models and the principle of superposition.
-Apply a structured knowledge of concepts, such as Coulomb's law, electric field, dipoles, electric potential energy and potential, Ohm's law, Kirchhoff's rules, magnetic field and force, Ampere's law, Faraday's law, Lenz's law, reflection and refraction, interference and diffraction and non-classical physics, when solving related problems.
-Use a step-by-step problem solving strategy to tackle sophisticated problems.
-Apply concepts such as symmetry, flux and integral calculus in electricity and magnetism.
-Perform appropriate data collection and analysis to investigate a physical relationship.
-Apply skills such as measurement taking, uncertainty propagation, graphical analysis, statistics and formal report writing, when working in the lab.
-Set a current limit and measure voltages and currents using a digital multi-meter.
-Simulate a simple circuit using a computer program (LT Spice).
-Set-up and operate an oscilloscope (including channel and trigger control, measuring signal parameters, reducing noise in signals and saving screen images to a computer).
-Display an AC waveform on an oscilloscope using a function generator.
-Design a PCB for circuit with two OPAMPs using the Eagle software package.
-Construct a simple RC circuit on a bread board.
-Observe the frequency response of an RC circuit using an oscilloscope.

Program Learning Outcomes:

If this course is taken as a requirement or an elective in the following first year, University Transfer Certificate programs, the learning outcomes are found in the Program Content Guides available at the Counselling and Advising Service areas.

University Transfer Arts Certificate
University Transfer Pathway to Health Sciences Certificate
University Transfer Science Certificate
University Transfer Engineering Certificate
University Transfer Computing Science and Software Systems Certificate

Evaluation/Grading System

Grading System	Specify if 'Other':	Specify Passing Grade:
Letter Grades		D

Components and Weighting of the Assessment/Evaluation Plan:

Type	Percentage	Evaluation Plan (provide a brief explanation for each component especially if value exceeds 35%):
Final Exam	30	
Lab Work	30	Formal lab reports, informal labs and a project
Assignments	10	
Midterm Exam	30	At least two midterms
Total	**100**	

Learning Environment/Type

Instruction Type	Hours Per Instruction Type	Comments
L - Classroom	120	classroom/lab
Total	**120**	

Resource Material(s):

Resources are items in addition to tuition that the student is responsible for purchasing. Course resource information will be supplied by the department/instructor.

Course Topics:

-Light and Wave Optics
-Optical Instruments
-Spectra and Quantization
-Electric forces and fields
-Gauss's law
-Current and Conductivity
-Electric Potential and Field
-DC Circuits
-Power Supplies and DMM
-Function Generators and Oscilloscopes
-Soldering and PCB design
-RC Frequency Response and Phase Difference
-RC Time Constant
-Magnetic Fields
-Electromagnetic Induction and AC circuits

VCC Education and Education Support Policies

There are a number of **Education** and **Education Support** policies that govern your educational experience at VCC, please familiarize yourself with them.

The policies are located on the VCC web site at:

http://www.vcc.ca/about/governance--policies/policies/

To find out how this course transfers, visit the BC Transfer Guide at www.bctransferguide.ca.

FOR COMMITTEE USE ONLY

Approved by Curriculum Committee:	Oct 20, 2015	**Approved by Education Council**:	Nov. 10, 2015