COURSE OUTLINE

Course Name: Physics of Music

Course Number: PHYS 1190 **Number of Credits:** 3.0 **Effective Date:** May 1, 2017

Course Description:

This course surveys the physics concepts related to music and is aimed primarily at non-science students. The course covers the propagation of sound, as well as the production and perception of music. Physics concepts will be illustrated using demonstrations and hands-on laboratory activities. Students will have the opportunity to perform simple physics experiments on actual musical instruments.

School or Centre:

Arts and Science

Year of Study:

1st Year Post-secondary

Course History:

New Course

Name of Replacing Course (if applicable):

Course Pre-requisites (if applicable):

Precalculus 11 with a C or VCC MATH 0861/0871 with a C or 72% on the VCC Intermediate algebra assessment.

Course Co-requisites (if applicable):

PLAR (Prior Learning Assessment & Recognition) ☒ No ☐ Yes (details below):

Instructional Strategies:

Lectures, demonstrations, concept-development worksheets, hands-on activities, laboratory exercises, and projects. Laboratory exercises will include, for example, the phenomena of standing waves in taut strings and open-closed tubes as well as an audiometry lab. Projects will utilize free 'apps' to, for example, perform spectrum analysis of musical instruments and examine room acoustics. Demonstrations will make use of equipment such as wave tanks and oscilloscopes.

Course Learning Outcomes:

Upon successful completion of this course, the student will be able to:
-Perform simple calculations involving quantities related to vibrations, waves (including standing waves on a string), sound intensity and room acoustics.
-Define terms related to sound such as amplitude, compression, rarefaction etc...
-Explain simple phenomena related to sound using concepts such as reflection, absorption, refraction, diffraction, the Doppler shift, interference and beats.
-Explain how the human ear perceives sound properties such as loudness and pitch.
-Define terms related to melody, harmony, scales, intervals, and how music is organized in time.
-Describe the production of sound by percussion instruments and strings (including bowed strings).
-Define terms related to the electronic synthesis of sound
-Explain the concepts related to resonance such as the response curve and dissipation.
-Describe the production of sound by the human voice, blown pipes, flutes and blown reed instruments.
-Explain the basic principles of transducers, microphones, amplifiers, music recording, and loudspeakers.
-Perform calculations involving harmonic intervals and tuning as well as repetition frequency and the period of a complex wave.

Program Learning Outcomes:

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	20	
Project	20	1-2 Projects
Assignments	15	Weekly problem sheets
Midterm Exam	30	Two midterms that add up to 30%
Lab Work	15	At least 5 hands-on lab activities
Total	**100**	

Learning Environment/Type

Instruction Type	Hours Per Instruction Type	Comments
L - Classroom	50	
B - Lab (Computer, Chemistry...)	10	
Total	**60**	

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:

The Nature of Sound
Waves and Vibrations
Sources of Sound
Sound Propagation
Sound Intensity and Its Measurement
The Production of Music
Classes of Instruments
Sound Reproduction
The Perception of Music
The ingredients of Music (melodies, harmonies, scales etc...)

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:	February 21, 2017	**Approved by Education Council**:	March 14, 2017