

This syllabus is provided as a general informational guide. Some of the information may vary depending on the specific course section and instructor. Different sections of the same course may require different textbooks. Verify the section specific textbook information in the CUNY's Academic Course Schedule Web Page. Modifications of the grading system presented here will be communicated by the instructors of the sections when they meet the class.

BOROUGH OF MANHATTAN COMMUNITY COLLEGE
The City University of New York
Department of Science

Title of Course: THE PHYSICS OF MUSIC

Lecture Hours: 3

PHY 400; Credits: 4

Laboratory Hours per Week: 2

Semester:

Instructor Information (Phone#, Office#, email):

Course Description:

In this course we will use the concepts and techniques of Classical Physics, Mathematics and Psychoacoustics to investigate the nature of sound and especially music. The Production, propagation and perception of musical sound will form the heart of this course. The student will become acquainted with the tools and techniques used by modern producers and musicians.

Basic Skills: Basic first year college Liberal Arts Mathematics and Science concepts and skills.

Prerequisites: The concepts and skills required will be reviewed in the course as required.

Corequisites: None

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Student Learning Outcomes (Students will be able to...):	Measurements (means of assessment for student learning outcomes listed in first column):
1-Gather, interpret, and assess information from a variety of sources and points of view.	1. In-class discussion and student presentations.
2-Evaluate evidence and arguments critically or analytically.	2. In-class discussion, graded laboratory reports.
3-Produce well-reasoned written or oral arguments using evidence to support conclusions.	3. Graded examinations and in-class discussions.
4-Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world.	4. Graded laboratory reports and examinations.
5-Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.	5. In-class discussions and graded presentations on related topics.
6-Articulate and evaluate the empirical evidence supporting a scientific or formal theory.	6. Graded examinations and laboratory reports, in-class discussion and student presentations.

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	General Education Learning Outcomes:	Measurements (means of assessment for general education goals listed in first column):
X	Communication Skills- Students will be able to write, read, listen and speak critically and effectively.	Graded examinations and laboratory reports and in-class discussions and student presentations.
X	Quantitative Reasoning- Students will be able to use quantitative skills and the concepts and methods of mathematics to solve problems.	Graded examinations and laboratory reports.
X	Scientific Reasoning- Students will be able to apply the concepts and methods of the natural sciences.	Graded examinations and laboratory reports.
	Social and Behavioral Sciences- Students will be able to apply the concepts and methods of the social sciences.	
X	Arts & Humanities- Students will be able to develop knowledge and understanding of the arts and literature through critiques of works of art, music, theatre or literature.	In-class discussions.
X	Information & Technology Literacy- Students will be able to collect, evaluate and interpret information and effectively use information technologies.	In-class discussions and student presentations.
	Values- Students will be able to make informed choices based on an understanding of personal values, human diversity, multicultural awareness and social responsibility.	

Required Text:

“*Good Vibrations: The Physics of Music*” by Barry Parker, Johns Hopkins

Other Resources:

Use of Technology: Online resources will be suggested in class.

Evaluation and Requirements of Students:

Grading: 4 Examinations: 20% each

Laboratory: 20%

Students will be given a chance to earn extra credit by making a short, in-class presentation on a relevant topic.

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Class Participation

Participation in the academic activity of each course is a significant component of the learning process and plays a major role in determining overall student academic achievement. Academic activities may include, but are not limited to, attending class, submitting assignments, engaging in in-class or online activities, taking exams, and/or participating in group work. Each instructor has the right to establish their own class participation policy, and it is each student's responsibility to be familiar with and follow the participation policies for each course.

BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

Single Stop www.bmcc.cuny.edu/singlestop, room S230, 212-220-8195. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, come by the Single Stop Office for advice and assistance. Assistance is also available through the Office of Student Affairs, S350, 212-220- 8130.

Counseling Center www.bmcc.cuny.edu/counseling, room S343, 212-220-8140. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

Office of Compliance and Diversity www.bmcc.cuny.edu/aac, room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email olevy@bmcc.cuny.edu, or twade@bmcc.cuny.edu. If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

Office of Accessibility www.bmcc.cuny.edu/accessibility, room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

BMCC Policy on Plagiarism and Academic Integrity Statement

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's Web site, www.bmcc.cuny.edu. For further information on integrity and behavior, please consult the college bulletin (also available online).

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Outline of Topics:

Week	LECTURE	CHAPTER	LAB EXPERIMENT
1	Measurable quantities, Units, One Dimensional Motion and Newton's Laws		Acceleration Due to Gravity – Free Fall
2	Hooke's Law, The Simple Harmonic Oscillator, The Pendulum and Spring		Simple Harmonic Motion: The Simple Pendulum
3	Waves, The Fundamental Relation, Sound		Simple Harmonic Motion: The Vibrating Spring
4	Standing Waves, Modes of a Vibrating String, Overtones and Tinbre		Wave Motion Demonstration
5	Hearing, The Decibel Scale, The Fletcher-Munson Curves		The Musical Keyboard Demonstration
6	The Ear and the Voice		The Guitar Demonstraion
7	Basic Room Acoustics, Room Modes, Reverberation		Air-Column Resonance and the Speed of Sound
8	Resonance and Formants		The Signal Generator and Hearing Frequencies of Sound
9	Oscillators, Filters and Synthesizers		Student Presentations 1
10	Sampling and Sound Design		Student Presentations 2
11	The DAW, Signal Processing, Effects		Student Presentations 3
12	Psychoacoustics, Frequency Ranges and Frequency Masking		Producing Electronic Dance Music 1
13	Producing, Mixing and Mastering		Producing Electronic Dance Music 2
14	Mathematics in Classical and Modern Music, The Golden Mean, Fibonacci		To Be Announced
15			