



Course Syllabus

# Physics 103

## Physics of Music Laboratory (ONLINE virtual classroom)

**PHYS 103**  
Fall 2020

### Learning Outcomes

This is a laboratory on the nature sound and music and its interpretations. It complements the lecture course of Physics 102. No mathematical skills are assumed beyond simple algebra and some knowledge of simple trigonometry and its functions.

The course is intended primarily for students who are not majoring in the physical sciences and who need to fulfill a General Education Natural Science Lab requirement. It may not fulfill general physical science course requirements

In this course you will explore:

- The properties of sound that we can quantify and measure
- What is the speed of sound. Measure the speed of sound
- Instrumentation to measure sound and reproduce music
- Measure your own hearing profile
- Introduction to Psychoacoustics

The course will be conducted **online via ZOOM and ELMS**. You must be able to download course material, the lab report templates and post the completed lab reports on ELMS. The report templates are WORD documents, You will have to participate in the scheduled virtual class session via ZOOM

### Required Resources

Course website: [www.elms.umd.edu](http://www.elms.umd.edu)  
Select Physics 103

### Required Text

**Physics 103 Laboratory Manual and Instruction Sheets**

*You will have to purchase online access to the Lab manual. Details are provided below.*

*Additional Instruction Sheets may be provided on ELMS as needed*

*You will have to prepare a lab report online while you are performing your experiments. You must answer the pre-lab questions online before the start of your scheduled class.*

**Prof. Andris Skuja**  
[skuja@umd.edu](mailto:skuja@umd.edu)

**Office Hours**  
by appointment via ELMS

### Class Sections

Section 101 Thursday  
11:00am to 12:50pm

Section 301 Thursday  
3:30pm to 5:20pm

Section 401 Friday 10:00am  
to 11:50am

Section 501 Friday  
12:00noon to 1:50pm

Section 701 Wednesday  
3:00pm to 4:50pm

Section 801 Wednesday  
1.00pm to 2:50pm

All sections meet online via  
ZOOM

### Teaching Assistants

### Graders

## *Headphones are required for Labs 9 and 10*

### **Course Overview:**

PHYS 103 PHYSICS OF MUSIC LABORATORY is a one (1) credit hour course that should be taken concurrently with PHYSICS 102 PHYSICS OF MUSIC to receive credit and may not be taken for credit by Physics Majors. The lab meets for two hours weekly, giving students hands-on in-depth experience with some of the topics covered in the Physics of Music lecture class. The Teaching Assistants will be the laboratory instructors. The lab reports will be graded by the TA's and the graders. **The lab classes will be conducted online via ZOOM at the scheduled time.**

The lab is a **participatory** activity, it is important that you attend all lab classes. It is also important that you prepare for your lab period by carefully reading the lab instruction sheets and doing the pre-lab questions. Pre-lab questions serve both as a review of important ideas and preparation for lab activities. If you do not do the pre-lab questions online before the start of the lab, you will receive no credit for them. If you do not understand the questions or have difficulty completing the assignment you may ask for clarification. Lab reports are completed online by the end of the lab period. You can access the lab report template online and download it to your laptop in advance.

You will carry out the lab individually and on your own. Discussion and cooperation with other students while doing the labs is encouraged. However, entry of observations and conclusions in the online Lab Report should be done by each student independently. Pre-lab questions should also be answered independently (after discussion when necessary). They pre-lab questions should be done online before coming to class.

Once you have completed your Lab Report you should post it on ELMS.

You will do each lab only once. **Additional credit** will **not** be given for repeating a lab.

If you **miss a lab**, your absence must be for a valid reason known as an excused absence. Please consult the following University website about missed classes:

<http://www.ugst.umd.edu/courserelatedpolicies.html>

If your absence is an excused absence you will be permitted to make up the missed lab without any loss of credit. You are encouraged to make up the missed lab by attending another lab session that week (at the discretion of the instructor) (see the lab schedule below). You may also make up the missed lab(s) by attending one or more of the lab sessions during make-up week as designated in the lab schedule. However, you shall get only half credit for any make-up labs which you missed during your regular lab sessions for unacceptable excuses. If you have to miss labs for

### **Prerequisites**

N/A

### **Course Communication**

Time-sensitive information regarding the course will be sent via an ELMS announcement. To discuss questions, appointments, absences, or accommodations, please contact your TA via ELMS.

religious reasons, you are encouraged to arrange for a make-up session before you miss the lab.

## **The Online Virtual Learning Experience:**

At *theexpertta* website you will find a list of experiments. By clicking on the experiment number you will open a list of options including the prelab questions. Open “Take Assignment” to complete the prelab questions.

Then open “View Printable Assignment”. Click on “Experiment Manual” for instruction sheet and links to videos and photos of measurements you are to make. Read the manual content and look at the videos. Then click on “Datasheet Download” to get the template for the lab report. The datasheet will also contain links to videos that will give you detailed instructions on data collection and data analysis.

You may have to attend the virtual class via ZOOM for clarification. The lab classes will be conducted online via ZOOM at the scheduled time. The TA on ZOOM will help you complete your report. It must be posted at the end of each scheduled virtual class as appropriate

**Grading** will be based on the total point accumulation for the 10 labs, each lab being worth a maximum of 30 points. The lab reports will constitute 85% of your grade. Your pre-lab responses will be worth 15% of your grade.

Final Grade Cutoffs								
+	97.00%	+	87.00%	+	77.00%	+	67.00%	
A	92.00%	B	82.00%	C	72.00%	D	62.00%	F <60.0%
-	90.00%	-	80.00%	-	70.00%	-	60.00%	

To qualify for an A, you must distinguish yourself among your peers. All these grade assignments are nominal and are based on previous experience of student participation in the course. In the unexpected circumstance that all students complete the labs with reasonable grades, failing letter grades will not be given.

**It is mandatory to do all labs. Missing one lab will lower your grade by one letter grade; missing two labs will result in a D grade and missing more than two labs will result in a grade of F. If you miss a lab for any reason you must make it up as explained previously if you do not want to be penalized in the manner just described. Credit for make-up labs will be given as explained previously.**

**Lab Manual:** You must purchase electronic access to the Experimental Instructions set. Access is available at

[theexpertta.com](http://theexpertta.com)

You can go to the site to register. Login and read/complete the introduction to *theexpertta*.

You will have to enter an access code by your class section number and follow instructions

The access codes are the ones starting with USH22MD below.

If you go to the link as posted below directly you will access the correct section corresponding to the appropriate code

Section	**Class Registration URL	
0101	<a href="http://goeta.link/USH22MD-0980CB-21E">http://goeta.link/USH22MD-0980CB-21E</a>	Th 11:00am - 12:50pm
0301	<a href="http://goeta.link/USH22MD-091A3F-21F">http://goeta.link/USH22MD-091A3F-21F</a>	Th 3:30pm - 5:20pm
0401	<a href="http://goeta.link/USH22MD-42EAD1-21I">http://goeta.link/USH22MD-42EAD1-21I</a>	F 10:00am - 11:50am
0501	<a href="http://goeta.link/USH22MD-0449FF-21J">http://goeta.link/USH22MD-0449FF-21J</a>	F 12:00pm - 1:50pm
0701	<a href="http://goeta.link/USH22MD-FFE306-21L">http://goeta.link/USH22MD-FFE306-21L</a>	W 3:00pm - 5:00pm
0801	<a href="http://goeta.link/USH22MD-33323A-21O">http://goeta.link/USH22MD-33323A-21O</a>	W 1:00pm - 2:50pm

**Preparation for Lab #1:** (a) Obtain your access, (b) Read the Introduction and the Lab #1 write-up and prepared the lab report as much as possible and then ask questions if you do not understand the material, (c) Answer the pre-lab questions before joining your class

## Schedule of Experiments:

Complete the pre-lab questions before coming to class

Week	Date	Experimental Topic			Lab Rep
1	Sept 2, 3 & 4	<b>No Lab. First week of Classes</b>			
2	Sept.8, 9 & 10	<b>Experiment 1:</b> Simple Harmonic Motion			Due at end of session
3	Sept. 16, 17 & 18	<b>Experiment 2:</b> Introduction to Electronic Instruments			Due at end of session
4	Sept. 23, 24 & 25	<b>Experiment 3:</b> Sound Quality and Wave Shape			Due at end of session
5	Sept. 30 & Oct. 1 & 2	<b>Experiment 4:</b> Speed of Sound in Air			Due at end of session
6	Oct. 7, 8 & 9	<b>Experiment 5:</b> Standing Waves in Stretched Strings			Due at end of Session
7	Oct. 14, 15 & 16	<b>Experiment 6:</b> Standing Waves in Air Columns			Due at end of Session
8	Oct. 21, 22 & 23	<b>Experiment 7:</b> Fourier Synthesis			Due at end of Session
9	Oct. 28, 29 & 30	<b>Experiment 8:</b> Fourier Analysis			Due at end of Session
10	Nov. 4, 5 & 6	<b>Experiment 9:</b> Our Hearing Profiles			Due at end of Session
11	Nov. 11, 12 & 13	<b>Experiment 10:</b> Psychoacoustics			Due at end of Session
12	Nov. 17, 18 & 19	<b>Make up week. You must get Approval to do a make-up lab</b>			Due at end of session
13	Nov. 25, 26 & 27	<b>Thanksgiving Week No Labs</b>			
13	Dec. 2, 3 & 4	No Labs. Special Consideration			
14	Dec. 9, 10 & 11	No Labs. Special Consideration			
15	<b>Dec. 16, 17 &amp; 18</b>	<b>Final Exam Week: No Labs</b>			

**You must finish all 10 labs and hand in the corresponding reports to successfully complete the course for full credit**

## Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit

[www.ugst.umd.edu/courserelatedpolicies.html](http://www.ugst.umd.edu/courserelatedpolicies.html) for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

