

**Course title:** Acoustics 1

**Course code:** 19016112

**Year/term:** Year 2/term 2

**Credit points:** 4

**Contact time:** 2-hour lecture & 4-hour lab

**Prerequisite:** None

**Online teaching platform:** Google Meet

**Lecturer and student contact via** Google classroom

### **Course Learning Outcomes**

1. Students will be able to describe and explain the properties of sound wave in the course of the generation at the source, the transmission in the medium and the reception by human ears or microphones.
2. Students will be able to employ the knowledge of standing wave and the Fourier synthesis/analysis to explain how musical sounds are created and modified by various instruments.
3. Students will be able to describe the primary factors and associated parameters that determine the acoustical characteristics of performance space.
4. Students will be able to use microphones and loudspeakers to measure and analyze the signal level, sound pressure level, and room acoustic parameters.

### **Generic learning outcome**

- G1. students are able to communicate and speak well in public
- G2. students are responsible for all assigned work on time
- G3. students are able to work as team.
- G4. students can use their knowledge to analyse, develop and create their own work.
- G5. students has a good skill in English communication, especially, the technical communication relates to sound and acoustic engineering

### Learning & Teaching Activities

Name	Learning outcome	Remarks
Lecture	1, 2, 3	Every week
Lab	1, 2, 3, 4	Every week
Homework (lab note)	1, 2, 3, 4, G2	Every lecture chapter and every lab topic
Group presentation	1, 2, 3, 4, G1, G3, G5	At the term end

### Assessment

Name	%	Learning outcome	Remarks
Exam	40	1, 2, 3	Midterm (20%), final (20%)
Quiz	25	1, 2, 3	~6 quizzes
Lab note	30	1, 2, 3, 4	
Group presentation	5	1, 2, 3, 4	At the term end

### Feedback

Activities	Remarks
Grade quiz and announce the score	After every quiz
Grade midterm and final exam, announce the score, and provide model answers	Within one week after midterm and final exam period
Return the graded lab note to students.	Within two weeks after the submission of lab notes.

## Time table

Week no.	Lecture topics	Lab topics
1	Introduction; simple harmonic motion	No lab
2	Simple harmonic motion	Essential Python programming
3	Waves and sound	Simple harmonic motion
4	Waves and sound	No lab; extra lecture on standing waves
5	Standing waves	Standing wave on string
6	Sound intensity level	Standing waves in air tube
7	Complex waves	SPL measurement I (indoor)
8	Complex waves	Complex waves on Python
9	Room acoustics	SPL measurement II (outdoor)
10	Room acoustics	Reverberation time measurement
11	Room acoustics	Room Mode
12	Sound recording & reproduction	No lab (public holiday)
13	Sound recording & reproduction	Stereophony I (amplitude panning)
14	Musical acoustics	Group presentation
15	Musical acoustics	No lab (public holiday)