



Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Audiology & Speech Pathology Department

AS313 Acoustics

First Semester 2021-2022

Course Catalog

2 Credit Hours. This course provides a study of basic perceptual and acoustical concepts of sound production, transmission, and effects on the auditory system. The relationships between the characteristics of the sounds that enter the ear and the sensations that they produce are also described in simple terms. Wherever it is possible, these relationships will be linked to the clinical practice, allowing the students to gain the fully understanding of course content.

Text Book

Title	An Introduction to the Psychology of Hearing
Author(s)	Brain C. J. Moore
Edition	6th Edition
Short Name	Ref# 1
Other Information	The book will be available in pdf format through the following link: https://justedujomy.sharepoint.com/:b:/g/personal/salqudah_just_edu_jo/Eb4w4O5OKRJOjtl09otDJB0BVOF1Y0ciYGedESosD6EUPw?e=NCLuZ

Instructor

Name	Dr. Safa Alqudah
Office Location	-
Office Hours	Mon : 11:30 - 12:30 Tue : 09:30 - 11:30 Tue : 12:30 - 13:30 Wed : 08:30 - 09:30 Thu : 12:30 - 13:30
Email	salqudah@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Sun : 11:30 - 12:30

Room: M3304

Section 2:

Lecture Time: Tue : 11:30 - 12:30

Room: M3304

Prerequisites

Line Number	Course Name	Prerequisite Type
1142141	AS214 Phonetics	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Class introduction Definition of Acoustics and scope	
Week 2	Physical characteristics of sound	Ch 4+6 From Ref# 1
Week 3	Introduction to Sound Intensity	Ch 4+6 From Ref# 1
Week 4	Exercises on Sound Intensity	Ch 4+6 From Ref# 1
Week 5	Applications on Sound Intensity	Ch 4+6 From Ref# 1
Week 6	Perceptual characteristics of sound	Ch 2 From Ref# 1
Week 7	Masking	Ch 3 From Ref# 1
Week 8	Auditory filters Auditory signal processing	Ch 3 From Ref# 1
Week 9	Speech production and signal representations	Ch 3, 5, 7, 8 From Ref# 1
Week 10	Vocal tract and Ear Resonances	Ch 3, 5, 7, 8 From Ref# 1
Week 11	Binaural hearing, spatial hearing, and localization	Ch 7, 9 From Ref# 1
Week 12	Room acoustics	Ch 8 From Ref# 1
Week 13	Digital Processing	Ch 10 From Ref# 1

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Define the science of acoustics and its scopes	1%	
Differentiate between sinusoidal and complex sound waves	3%	
Know the physical characteristics, such as frequency, amplitude, and phase.	5%	

Identify the perceptual outcomes of acoustical signals, including the loudness and pitch.	5%	
Demonstrate the relationship between the sound intensity and sound pressure level.	2%	
Describe the approaches used to measure loudness level.	5%	
Know the factors affecting the loudness level and loudness growth.	8%	
Determine how to calculate the hearing threshold, most comfortable level of hearing, and dynamic range of hearing.	2%	
Define the masking phenomenon, types of masking, and difference between quiet and masking thresholds.	3%	
Describe the types of non-simultaneous masking and the usage for each type in the clinical and research settings.	2%	
Discuss the link between the function of auditory filters inside the ear and masking principle.	5%	
Explain the mechanisms of the auditory system responsible for frequency effect on absolute threshold.	2%	
Understand the role of source filter theory in explaining speech production.	8%	
Describe how to calculate the resonant frequency of the external ear and pay attention to the clinical application of losing this feature when wearing amplification device	3%	
Describe how to calculate the formants of the external ear.	3%	
Illustrate the transfer functions of different external ear components.	2%	
Learn the physical role of the middle ear in the auditory system as transformer.	2%	
Define the types of acoustical filters in the inner ear, and know some filter terminologies, such as bandwidth, pass-band, and stop-band.	7%	
State the advantages of binaural hearing over monaural hearing.	3%	
Explain the binaural summation, binaural squelch, and sound localization mechanisms in the ear.	5%	
Demonstrate the cues to sound localization, which are interaural time differences (ITD) and interaural level differences (ILD).	3%	
Get familiar with the basic principles of designing acoustic rooms.	5%	
Know the environmental effects on speech communication.	3%	
Analyze the negative consequence of reverberation on the auditory perception.	3%	
Explain the digital signal processing components	10%	

Policy

Exams	<p>1) The course will be broken into 2 exams. Exams will include short essay, multiple-choice, True/ False, and sentence completion questions</p> <p>2) Make-up exam including quizzes will be granted for excused absence only.</p> <p>3) Extenuating circumstances(PRIOR approval should be obtained or direct contact made with the instructor within 24 hours).</p> <p>4) The student has one week from the time any exam is returned to the class to appeal the grade</p>
Cheating	The instructor will follow JUST's rules and regulation
Attendance	<p>1) Attendance will not be counted for points in this class.</p> <p>2) The student is responsible for any information discussed in lecture.</p> <p>3) It is not imperative to attend all classes.</p>
Expected work load	Students are expected to work hard in order to ensure a high quality learning
Feedback	<p>Concerns or complaints should be expressed in the first instance to the course instructor Questions about the material covered in the lecture, notes on the content of the course, the teaching and assessment methods can be also sent by e-mail to the following address:</p> <p>salqudah@just.edu.jo</p>

Date Printed: 2021-11-14