



# CAUD8102

## Acoustics and Psychoacoustics

Session 1, In person-scheduled-weekday, North Ryde 2024

*Department of Linguistics*

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## General Information

Unit convenor and teaching staff

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Credit points

10

Prerequisites

Admission to MCLinAudiology

Corequisites

CAUD8101 and CAUD8103 and CAUD8104

Co-badged status

Unit description

The unit aims to provide you with the knowledge of sound, its physical properties, and fundamentals of auditory perception. In this unit you will learn about the perception of sound in normal hearing adults and the impact of hearing loss on auditory perception. The unit is essential for developing audiological clinical skills as you will learn to apply the principles of psychoacoustics to diagnostic audiology and auditory rehabilitation.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

**ULO1:** Apply the basic principles of acoustics, acoustic measures, and instrument calibration to diagnostic audiology. (Capability 1 Scientist & Scholar)

**ULO2:** Discuss the basic perceptual attributes of auditory sensation and be able to differentiate their physical/physiological correlates, examine how these are mediated by

hearing impairment and their impact on hearing impaired clients. (Capability 2 Practitioner)

**ULO3:** Describe and critically evaluate the properties and analysis of complex sounds, sound transmission, and speech perception including phonology. (Capability 1 Scientist & Scholar)

**ULO4:** Explain the functioning of the auditory system, and the importance of binaural hearing for localisation and listening in noise. (Capability 1 Scientist & Scholar)

## General Assessment Information

Grade descriptors and other information concerning grading are contained in the [Macquarie University Assessment Policy](#).

All final grades are determined by a grading committee, in accordance with the Macquarie University Assessment Policy, and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade and a mark which must correspond to the grade descriptors specified in the [Assessment Procedure](#) (clause 128).

To pass this unit, you must demonstrate sufficient evidence of achievement of the learning outcomes, meet any ungraded requirements, and achieve a final mark of 50 or better.

Further details for each assessment task will be available on iLearn.

## Late Submissions

Unless a Special Consideration request has been submitted and approved, a 5% penalty (OF THE TOTAL POSSIBLE MARK) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55pm. A 1-hour grace period is provided to students who experience a technical concern.

For example:

Number of days (hours) late	Total Possible Marks	Deduction	Raw mark	Final mark
1 day (1-24 hours)	100	5	75	70
2 days (24-48 hours)	100	10	75	65
3 days (48-72 hours)	100	15	75	60
7 days (144-168 hours)	100	35	75	40
>7 days (>168 hours)	100	-	75	0

Late submission of time sensitive tasks, such as timetabled tests/exams, scheduled performance assessments/presentations, scheduled practical assessments/labs, will be addressed by the unit convenor in a Special consideration application.

## Special Consideration

If you are unable to complete an assessment task on or by the specified date due to circumstances that are unexpected, unavoidable, significantly disruptive and beyond your control, you may apply for special consideration in accordance with the [special consideration policy](#). Applications for special consideration must be supported by appropriate evidence and submitted via [ask.mq.edu.au](http://ask.mq.edu.au).

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Quiz</a>	20%	No	18/03/2024
<a href="#">Report</a>	20%	No	15/04/2024
<a href="#">Case-based assessment</a>	20%	No	19/05/2024
<a href="#">Exam</a>	40%	No	Week 23 - 25

### Quiz

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **18/03/2024**

Weighting: **20%**

You will complete calculations relating to acoustic and psychoacoustic questions.

On successful completion you will be able to:

- Apply the basic principles of acoustics, acoustic measures, and instrument calibration to diagnostic audiology. (Capability 1 Scientist & Scholar)
- Discuss the basic perceptual attributes of auditory sensation and be able to differentiate their physical/physiological correlates, examine how these are mediated by hearing impairment and their impact on hearing impaired clients. (Capability 2 Practitioner)

### Report

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 10 hours

Due: **15/04/2024**

Weighting: **20%**

You will complete a report exploring your understanding of the acoustical and psychoacoustical principles underpinning the exercises completed as part of your practicum activity.

On successful completion you will be able to:

- Apply the basic principles of acoustics, acoustic measures, and instrument calibration to diagnostic audiology. (Capability 1 Scientist & Scholar)
- Discuss the basic perceptual attributes of auditory sensation and be able to differentiate their physical/physiological correlates, examine how these are mediated by hearing impairment and their impact on hearing impaired clients. (Capability 2 Practitioner)
- Explain the functioning of the auditory system, and the importance of binaural hearing for localisation and listening in noise. (Capability 1 Scientist & Scholar)

## Case-based assessment

Assessment Type <sup>1</sup>: Presentation

Indicative Time on Task <sup>2</sup>: 20 hours

Due: **19/05/2024**

Weighting: **20%**

You will apply both acoustic and psychoacoustic knowledge to a case study and provide a presentation demonstrating the importance of these principles in clinical practice

On successful completion you will be able to:

- Apply the basic principles of acoustics, acoustic measures, and instrument calibration to diagnostic audiology. (Capability 1 Scientist & Scholar)
- Discuss the basic perceptual attributes of auditory sensation and be able to differentiate their physical/physiological correlates, examine how these are mediated by hearing impairment and their impact on hearing impaired clients. (Capability 2 Practitioner)
- Describe and critically evaluate the properties and analysis of complex sounds, sound transmission, and speech perception including phonology. (Capability 1 Scientist & Scholar)
- Explain the functioning of the auditory system, and the importance of binaural hearing for

localisation and listening in noise. (Capability 1 Scientist & Scholar)

## Exam

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 30 hours

Due: **Week 23 - 25**

Weighting: **40%**

You will complete a final exam with short answers and calculations covering both acoustics, psychoacoustics and their relationship to clinical practice.

On successful completion you will be able to:

- Apply the basic principles of acoustics, acoustic measures, and instrument calibration to diagnostic audiology. (Capability 1 Scientist & Scholar)
- Discuss the basic perceptual attributes of auditory sensation and be able to differentiate their physical/physiological correlates, examine how these are mediated by hearing impairment and their impact on hearing impaired clients. (Capability 2 Practitioner)
- Describe and critically evaluate the properties and analysis of complex sounds, sound transmission, and speech perception including phonology. (Capability 1 Scientist & Scholar)
- Explain the functioning of the auditory system, and the importance of binaural hearing for localisation and listening in noise. (Capability 1 Scientist & Scholar)

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Delivery and Resources

This is a blended unit with in-person consolidations and practicals, alongside pre-recorded online content. It is expected that students will complete the pre-recorded content in preparation for upcoming consolidation classes. Students will be informed of content release and expected

tasks to complete prior to attending the consolidation class.

### Recommended Readings

These are provided on the iLearn site and include publications which align with the learning material. These are recommended to deepen your understanding of course content.

### Technology Used

Active participation in the learning activities throughout the unit may require students to have access to a tablet, laptop or similar device. Students who do not own their own laptop computer may borrow one from the university library.

## Unit Schedule

Consolidation Sessions	Week
1 - Acoustics: Basic physical concepts	Week 9
2 – Nature of Sound	Week 9
3 – Measurement of Sound	Week 10
<b>Practicum: Sound level meters</b>	Week 10
4 – Fundamentals of Acoustic Masking	Week 10
<b>Practicum: Math Camps</b>	Week 11
5 – Calibration	Week 12
<b>Practicum: Psychoacoustics</b>	Week 12
6 – General Psychoacoustics and Bone Conduction Hearing	Week 13
7 – Speech acoustics and perception	Week 15
8 – Analysis of Sound	Week 15
9 – Complex Sounds	Week 18
10 - Room Acoustics	Week 19
11 - Introduction to Auditory processing	Week 20
12 - Spatial Hearing and Scene Analysis	Week 21
13 – Unit Review	Week 22

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

### Declaration of Generative AI and AI-assisted technologies used in assessment tasks

In line with the [Academic Integrity Policy](#), the following use of Generative Artificial Intelligence Tools (GAITs) in assessment tasks constitutes academic misconduct:

"Occurs when a student uses material produced by a generative artificial intelligence in an

academic exercise, without authorisation and submits it as their own work."

Unauthorised use of generative artificial intelligence	Unauthorised use of generative artificial intelligence may include using generative artificial intelligence to: <ol style="list-style-type: none"><li>1. produce or retrieve information and then using that information in an academic exercise;</li><li>1. paraphrase text;</li><li>1. increase or enhance the quality of an academic exercise, beyond the purposes permitted within the academic exercise;</li><li>1. produce an answer for a task or quiz; and / or</li><li>1. produce non-text-based work and then using that non-text-based work in an academic exercise</li></ol>
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Each assessment task may have different guidelines on the accepted use of GAITs. Please ensure you check each assessment task instruction sheet carefully and follow the guidelines to avoid penalty. If you have doubts about what is permitted for each assessment, please check with your unit convenor. Please visit the [AI Tools at Macquarie University - For Students](#), for more resources.

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

### The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)

- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

## Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Inclusion and diversity

Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others based on their sex, gender, race, marital status, carers' responsibilities, disability, sexual orientation, age, political conviction or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone. Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others based on their sex, gender, race, marital status, carers' responsibilities, disability, sexual orientation, age, political conviction or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone.

## Professionalism

In the Faculty of Medicine, Health and Human Sciences, professionalism is a key capability

embedded in all our courses.

As part of developing professionalism, students are expected to attend all small group interactive sessions including clinical, practical, laboratory, work-integrated learning (e.g., PACE placements), and team-based learning activities. Some learning activities are recorded (e.g., face-to-face lectures), however, you are encouraged to avoid relying upon such material as they do not recreate the whole learning experience and technical issues can and do occur. As an adult learner, we respect your decision to choose how you engage with your learning, but we would remind you that the learning opportunities we create for you have been done so to enable your success and that by not engaging you may impact your ability to successfully complete this unit. We equally expect that you show respect for the academic staff who have worked hard to develop meaningful activities and prioritise your learning by communicating with them in advance if you are unable to attend a small group interactive session.

Another dimension of professionalism is having respect for your peers. It is the right of every student to learn in an environment that is free of disruption and distraction. Please arrive to all learning activities on time, and if you are unavoidably detained, please join activity as quietly as possible to minimise disruption. Phones and other electronic devices that produce noise and other distractions must be turned off prior to entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to avoid distraction to you and others. Please treat your fellow students with the utmost respect. If you are uncomfortable participating in any specific activity, please let the relevant academic know.

## Changes since First Published

Date	Description
13/02/2024	Jorg Buchholz added to teaching staff.

Unit information based on version 2024.02 of the [Handbook](#)