



SPHL2216

Speech Acoustics

Session 2, In person-scheduled-weekday, North Ryde 2026

Department of Linguistics

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Unit Schedule</u>	6
<u>Policies and Procedures</u>	6
<u>Changes since First Published</u>	8

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Joshua Penney

joshua.penney@mq.edu.au

Iain Giblin

iain.giblin@mq.edu.au

Credit points

10

Prerequisites

LING217 or LING2217

Corequisites

Co-badged status

Unit description

Human speech makes use of the special acoustic properties of the vocal tract to generate the sounds of each language and to communicate them with an unlimited range of expression. In this unit, we explore the acoustic properties of speech which make this possible, and acoustic theories of speech production which describe its linguistic use. Topics include: general acoustics, source-filter theory, acoustics of vowels and consonants, acoustic description of Australian English and sounds in other languages, voice quality, speech variation, coarticulation, and prosody. Practical exercises include analysis of your own vowel space.

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: Explain how speech can be represented acoustically.

ULO2: Illustrate concepts pertinent to the acoustic theory of speech production.

ULO3: Analyse the acoustic features of consonants and vowels using standard methodologies.

ULO4: Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.

ULO5: Describe the acoustic characteristics of different speech source types and voice qualities.

ULO6: Demonstrate the ability to deconstruct coarticulated acoustic representations.

ULO7: Analyse and describe the acoustic correlates of prosody.

ULO8: Engage in a research-rich environment.

Assessment Tasks

Name	Weighting	Hurdle	Due	Groupwork/Individual	Short Extension	AI Approach
<u>Consonant Analysis</u>	30%	No	30/10/2026	Individual	Yes	Open
<u>Vowel Analysis</u>	30%	No	11/09/2026	Individual	Yes	Open
<u>Final Exam</u>	40%	No	Exam period	Individual	No	Observed

Consonant Analysis

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 27 hours

Due: **30/10/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The aim of this assignment is to examine the acoustic phonetic properties of English consonants in connected speech. Using the tools and techniques for spectrographic analysis developed in workshops, students will segment and quantify the consonants in speech recordings, and analyze and describe the allophonic and coarticulatory processes involved.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.
- Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.
- Describe the acoustic characteristics of different speech source types and voice qualities.
- Demonstrate the ability to deconstruct coarticulated acoustic representations.
- Analyse and describe the acoustic correlates of prosody.

- Engage in a research-rich environment.

Vowel Analysis

Assessment Type ¹: Written Submission

Indicative Time on Task ²: 27 hours

Due: **11/09/2026**

Weighting: **30%**

Groupwork/Individual: Individual

Short extension ³: Yes

AI Approach: Open

The aim of this assignment is to examine the acoustic phonetic properties of the vowels of a single speaker. Using the tools and techniques for spectrographic analysis developed in workshops, students will plot their own vowel space, and present a report describing the phonetic properties of their vowels in comparison with published vowel data.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.
- Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.
- Demonstrate the ability to deconstruct coarticulated acoustic representations.
- Engage in a research-rich environment.

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 30 hours

Due: **Exam period**

Weighting: **40%**

Groupwork/Individual: Individual

Short extension ³: No

AI Approach: Observed

Knowledge and understanding of the topics covered in the unit will be assessed in a closed book 90 minute examination, requiring written responses to a range of questions and problems.

On successful completion you will be able to:

- Explain how speech can be represented acoustically.
- Illustrate concepts pertinent to the acoustic theory of speech production.
- Analyse the acoustic features of consonants and vowels using standard methodologies.

- Differentiate the acoustic characteristics of segmental and voice quality aspects of speech.
 - Describe the acoustic characteristics of different speech source types and voice qualities.
 - Demonstrate the ability to deconstruct coarticulated acoustic representations.
 - Analyse and describe the acoustic correlates of prosody.
-

¹ 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
- [Academic Success](#) for academic skills support.

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

³ An automatic short extension is available for some assessments. Apply through the [Service Connect Portal](#).

Delivery and Resources

This unit is designed to foster a detailed understanding of speech acoustics, its relevance to phonetics and phonology, and methods used to study the acoustic properties of speech. These concepts will be studied through an extensive set of readings and multimedia resources, and will be consolidated in companion lectures, workshops and assessment tasks. The unit provides students with essential theoretical and practical skills that are fundamental to further study of speech and which assist clinicians in understanding and working with speech and auditory data.

Topics to be covered include: general acoustic theory; sound waves; spectrograms; resonance; turbulence; source-filter theory; formants; acoustic properties of vowels; acoustic properties of consonants; coarticulation; prosody; and digital representation and processing of speech.

Students are required to engage seriously with all learning materials following the schedule provided on iLearn. Announcements and discussion forums should be consulted regularly, and teaching materials must be reviewed in a timely manner to ensure that all participants are up-to-date with communications and aware of unit requirements. Active participation in the learning activities throughout the unit will require students to have access to computer. Students who do not own their own computer may use computing resources provided by the university library.

In workshops and assessment tasks, you will be presented with different types of speech data, and record your own speech for analysis, to consolidate your understanding of acoustic phonetics. These materials are designed to help you explore how speakers of different languages manipulate the acoustic properties of speech to generate phonological contrast, to signal linguistic information, and to communicate information about who we are.

Preparation for and attendance at all classes is expected. Classes are designed to consolidate

concepts introduced in readings, through explanation and presentation of examples, engagement with different types of data, questions, discussion, and seminar-type exercises. Learning the concepts necessary to gain a solid understanding of speech acoustics and speech analysis techniques requires dedication, practice, and engagement. We are here to support your learning and we can only do this successfully through structured contact to guide you through the materials and techniques. It is your responsibility to actively engage in the learning process with your teachers and peers.

Unit Schedule

Details of all topics, readings, class schedules, and assessment tasks are provided on iLearn, and updated each week. It is your responsibility to consult iLearn regularly and make sure you are prepared for each class by familiarizing yourself with all learning resources and requirements.

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 connect.mq.edu.au or if you are a Global

MBA student contact 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](#).

Student Support

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

Academic Success

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

- [Ask a Study Coach](#)
- [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 the [Service Connect Portal](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit <https://students.mq.edu.au/support/technology/service-desk>.

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.

Changes since First Published

Date	Description
22/07/2026	The due date for the vowel analysis assessment task was corrected.

Unit information based on version 2026.02 of the [Handbook](#)