



# SPH 312

## Auditory Physiology and Psychoacoustics

S1 Day 2015

*Dept of Linguistics*

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## General Information

### Unit convenor and teaching staff

Convenor

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Margaret Wood

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### Credit points

3

### Prerequisites

6cp in LING units at 200 level including (LING210(P) or LING217(P))

### Corequisites

### Co-badged status

### Unit description

This unit is a detailed examination of human auditory anatomy and physiology, and also of psychoacoustics and speech perception. The structure of the outer, middle and inner ear, the auditory nerve, the auditory brainstem and the auditory cortex are examined, as are the mechanisms of hearing and the physiology of the auditory system. Another major focus of this unit is the psychoacoustics of hearing and speech perception, which are examined both in lectures and in practicals.

## 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:

to develop an understanding of the auditory system and how it functions and the need for binaural hearing

to develop an understanding of how we perceive and process speech sounds

to develop an understanding of how we perceive and process simple and complex non-speech soundsspeech sounds

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>OAE report</u></a>	20%	23/03/2015
<a href="#"><u>Psychoacoustic report</u></a>	20%	27/04/2015
<a href="#"><u>Speech perception report</u></a>	20%	8/06/2015
<a href="#"><u>Final examination</u></a>	40%	Examination period

### OAE report

Due: **23/03/2015**

Weighting: **20%**

The measuring of otoacoustic emissions (OAEs) is important for detecting inner ear problems. This practicum will introduce you to this important audiological procedure. You will be asked to interpret the generated data and write a research report outlining your findings.

On successful completion you will be able to:

- to develop an understanding of the auditory system and how it functions and the need for binaural hearing

### Psychoacoustic report

Due: **27/04/2015**

Weighting: **20%**

Psychoacoustics is the use of various, very often simple, sounds that enable us to better understand the workings of the auditory system. In this workshop you will learn how to carry out an example of a psychoacoustic procedure (and you will also be asked to participate in the data collection as a participant in the experiment). The procedure involves listening to simple sounds and responding with a simple response (e.g. yes-no, same-different, etc). You will be asked to interpret the generated data to determine how the auditory system processes these simple sounds and to deduce what this can tell us about the auditory processing of more complex sounds, such as speech and music.

On successful completion you will be able to:

- to develop an understanding of how we perceive and process simple and complex non-speech sounds

### Speech perception report

Due: **8/06/2015**

Weighting: **20%**

In this practicum you will examine simple speech sounds (most likely single syllable words) that have been distorted or modified in some way. You will be asked to determine how these distortions or modifications have affected the perception of these words and will also be asked to think about the extent to which this type of procedure might provide insights into both unimpaired speech perception as well as speech perception of people with hearing loss.

On successful completion you will be able to:

- to develop an understanding of how we perceive and process speech sounds

## Final examination

Due: **Examination period**

Weighting: **40%**

Short essay structure

On successful completion you will be able to:

- to develop an understanding of the auditory system and how it functions and the need for binaural hearing
- to develop an understanding of how we perceive and process speech sounds
- to develop an understanding of how we perceive and process simple and complex non-speech sounds

## Delivery and Resources

This unit has a presence on iLearn (ilearn.mq.edu.au)

Use of the Audiology lab and the Speech Perception lab for workshops

The unit requires a range of audiological technology that form part of the audiological teaching laboratories. The unit also utilises the AHH speech perception laboratory which is equipped with computers and computer based speech perception and psychoacoustics software, as well as equipment for the careful determination of sound levels presented to the students.

## Unit Schedule

1. The Ear: An overview
2. Cochlear anatomy / physiology (with OAE practicum)
3. Cochlear transduction
4. Neural function
5. Brainstem nuclei and efferent pathways

6. Psychoacoustics I
7. Psychoacoustics II (with psychoacoustics practicum)
8. Psychoacoustics III
9. Speech perception I
10. Speech perception II (with speech perception practicum)
11. Speech perception III
12. Auditory Cortex

## Policies and Procedures

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

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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](http://ask.mq.edu.au).

## Student Support

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

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

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

## Graduate Capabilities

### Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### Learning outcomes

- to develop an understanding of the auditory system and how it functions and the need for binaural hearing
- to develop an understanding of how we perceive and process speech sounds
- to develop an understanding of how we perceive and process simple and complex non-speech sounds

### Assessment tasks

- OAE report
- Psychoacoustic report

- Speech perception report
- Final examination

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

### Learning outcomes

- to develop an understanding of the auditory system and how it functions and the need for binaural hearing
- to develop an understanding of how we perceive and process speech sounds
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### Assessment tasks

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- Final examination

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

### Learning outcomes

- to develop an understanding of the auditory system and how it functions and the need for binaural hearing
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## Assessment tasks

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## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

## Assessment tasks

- OAE report
- Psychoacoustic report
- Speech perception report
- Final examination