



# PHL 134

## Formal Logic

S2 Day 2015

*Dept of Philosophy*

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### Disclaimer

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## General Information

Unit convenor and teaching staff

Unit Convenor

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W6A 722

TBA

Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

Logic is concerned with the study of good reasoning. While PHL137 examines reasoning as it occurs in everyday life, this unit is a course in formal logic, where we look behind these particular contexts and consider what it is that makes a piece of reasoning good or bad: What makes one claim follow from another? People disagree about all sorts of things, but are there some claims and arguments that any rational person must accept? If so, what is special about those claims and arguments? In this unit, you will learn to use formal techniques to prove whether certain kinds of arguments are valid or invalid, and will examine some of the philosophical problems that arise in connection with the methods and assumptions of formal logic. The unit is suitable for those with an interest in the nature and philosophy of logic for its own sake, and for those who want to understand the techniques of formal logic for use in philosophy, or in other areas such as computing, mathematics and linguistics.

## 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:

Translate between English and the language of propositional logic

Use truth tables and variants to test formulas and arguments in propositional logic

Use trees to test formulas and arguments in propositional logic

Translate between English and the language of predicate logic.

Use trees to test formulas and arguments in predicate logic

Understand and apply fundamental logical concepts

Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

Demonstrate commitment to learning through regular engagement

## General Assessment Information

Requests for extensions for exercises or quizzes should be directed to Jenny as soon as possible, and will only be granted in cases of illness or misadventure. Exercises that are submitted late without an extension (or which are submitted after the extension date) will lose one mark for each day late, including weekends.

Anyone who misses an in-class test due to illness or misadventure should contact the convenor as soon as possible to arrange a supplementary test.

Other assessment problems should be discussed with the convenor as soon as they arise.

## Assessment Tasks

| Name                                   | Weighting | Due                        |
|--|-----------|----------------------------|
| <a href="#"><u>Online quiz 1</u></a>   | 5%        | 9pm, Friday, 14/8          |
| <a href="#"><u>Exercise 1</u></a>      | 10%       | In Wk 5 tuts (27&28/8)     |
| <a href="#"><u>In-class test 1</u></a> | 30%       | Thursday 10/9/15           |
| <a href="#"><u>Online quiz 2</u></a>   | 5%        | 9pm, Friday 16/10/15       |
| <a href="#"><u>Exercise 2</u></a>      | 10%       | In Wk 11 tuts (22 & 23/10) |
| <a href="#"><u>In-class test 2</u></a> | 30%       | Thursday 5/11/15           |
| <a href="#"><u>Participation</u></a>   | 10%       | Weeks 2-12                 |

### Online quiz 1

Due: **9pm, Friday, 14/8**

Weighting: **5%**

Online quiz 1 is available from 9am Monday August 10 until 9pm on Friday August 14 (week 3). It consists of five multiple choice questions, and you will have 20 minutes to complete it. Further instructions will be given through iLearn.

The quiz covers material from weeks 1 and 2, and is designed to give you early feedback on your progress in the unit.

On successful completion you will be able to:

- Translate between English and the language of propositional logic
- Understand and apply fundamental logical concepts

## Exercise 1

Due: **In Wk 5 tuts (27&28/8)**

Weighting: **10%**

A short exercise based on material from the first four weeks.

The exercise will be given out in your tutorial in week 4, and available online after the tutorials. It is due at the beginning of your tutorial in week 5. It will be returned in your tutorial in week 6.

**Anyone who will not be in the tutorial in week 5 must make arrangements to submit the exercise directly to Jenny before the tutorial time.**

On successful completion you will be able to:

- Translate between English and the language of propositional logic
- Use truth tables and variants to test formulas and arguments in propositional logic
- Use trees to test formulas and arguments in propositional logic
- Understand and apply fundamental logical concepts

## In-class test 1

Due: **Thursday 10/9/15**

Weighting: **30%**

The first in-class test will be held in the lecture on Thursday the 10th of September (Week 7). It will be a 50 minute test, covering material from weeks 1-6. The Wednesday lecture in week 7 will be used for test revision.

### **In-class test 'safety net'**

Any student who makes a serious attempt at the first in-class test but receives a mark under 50% for it, will be given the opportunity to complete some additional work as determined by the convenor, and sit a supplementary test on a Pass/Fail basis (ie for a maximum mark of 50%) at a time to be negotiated with the convenor, no later than the end of week 9. No extensions of time will be given. This opportunity is only available for the first in-class test, and is intended to help ensure that all students meet the learning outcomes for the first part of the course required for success in the second half.

On successful completion you will be able to:

- Translate between English and the language of propositional logic

- Use truth tables and variants to test formulas and arguments in propositional logic
- Use trees to test formulas and arguments in propositional logic
- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## Online quiz 2

Due: **9pm, Friday 16/10/15**

Weighting: **5%**

Online quiz 2 is available from 9am Monday October 12 until 9pm on Friday October 16 (week 10). It consists of five multiple choice questions, covering material from weeks 8 and 9, and you will have 20 minutes to complete it. Further instructions will be given through iLearn.

On successful completion you will be able to:

- Translate between English and the language of predicate logic.
- Understand and apply fundamental logical concepts

## Exercise 2

Due: **In Wk 11 tuts (22 & 23/10)**

Weighting: **10%**

A short exercise based on material from weeks 8-10.

The exercise will be given out in your tutorial in week 10, and available online after the tutorials. It is due at the beginning of your tutorial in week 11. It will be returned in your tutorial in week 12. **Anyone who will not be in the tutorial in week 11 must make arrangements to submit the exercise directly to Jenny before the tutorial time.**

On successful completion you will be able to:

- Translate between English and the language of predicate logic.
- Use trees to test formulas and arguments in predicate logic
- Understand and apply fundamental logical concepts

## In-class test 2

Due: **Thursday 5/11/15**

Weighting: **30%**

The second in-class test will be held in the lecture on Thursday the 5th of November (Week 13). It will be a 50 minute test, covering material from weeks 8-12. The Wednesday lecture in week 13 will be used for test revision.

On successful completion you will be able to:

- Translate between English and the language of predicate logic.
- Use trees to test formulas and arguments in predicate logic
- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## Participation

Due: **Weeks 2-12**

Weighting: **10%**

Participation is an essential part of this unit, since you will be developing a set of skills that are formed through practice. You will therefore be assessed on your level of engagement with the content throughout the unit.

Internal students will be assessed on participation in weekly tutorials (weeks 2-6 and 8-12). This is not merely a matter of attendance, but involves coming prepared, engaging in class discussions, asking and answering questions etc. Your mark for participation will depend on your level of engagement, rather than on how many answers you get right. Asking questions is as good a demonstration of engagement as answering them.

On successful completion you will be able to:

- Translate between English and the language of propositional logic
- Use truth tables and variants to test formulas and arguments in propositional logic
- Use trees to test formulas and arguments in propositional logic
- Translate between English and the language of predicate logic.
- Use trees to test formulas and arguments in predicate logic
- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.
- Demonstrate commitment to learning through regular engagement

## Delivery and Resources

### CLASSES

**Internal students** are required to attend two lectures and one tutorial each week. The tutorials for each week follow on directly from the lectures, so we will be discussing each week's lecture topics in the same week's tutorials. Tutorials begin in week 2. There are no tutorials after the in-class tests in weeks 7 and 13. Jenny Duke-Yonge is the lecturer and tutor for this unit.

The timetable for this unit can be found at <https://timetables.mq.edu.au>. You should check the timetable prior to the start of the Session for any updates.

**Please note that this unit is not offered with an internal iLearn only option.** This is partly because the tutorials run directly on from the lectures, and partly because of the in-class assessments in Weeks 7 and 13.

If you are unable to attend one or both of the lectures on a regular basis, you should:

1. Consider enrolling as an external student, or
2. Enrol in a tutorial that gives you time to catch up on the iLectures before coming to the tutorial, and ensure that you do so. You will still need to make arrangements to come to the Thursday lectures in weeks 7 and 13, when the in-class tests are held.

## REQUIRED TEXT

The textbook for the unit is Logic Greg Restall (UCL Press, ISBN 9780415400688). This book will be used throughout the course and you will need a copy of it. It is available at the Co-op Bookshop.

## UNIT WEBPAGE AND TECHNOLOGY USED AND REQUIRED

This unit has an online presence. Login is via: <https://ilearn.mq.edu.au/> Students are required to have regular access to a computer and the internet. Mobile devices alone are not sufficient.

- For technical support go to: [http://mq.edu.au/about\\_us/offices\\_and\\_units/informatics/help](http://mq.edu.au/about_us/offices_and_units/informatics/help) - For student quick guides on the use of iLearn go to: [http://mq.edu.au/iLearn/student\\_info/guides.htm](http://mq.edu.au/iLearn/student_info/guides.htm)

## PASS (Peer Assisted Study Sessions)

Peer Assisted Study Sessions (PASS) are now operating in this unit.

PASS sessions are not compulsory, but are highly recommended for all students taking this unit.

PASS sessions are 1 hour weekly study groups where students get together to consolidate their understanding of the course material; reinforce key concepts and develop effective study strategies. Students work in small study groups facilitated by skilled leaders who will specifically guide your learning. PASS Leaders are former students of this unit who achieved excellent results themselves, and who have been trained as PASS leaders to help you get the most out of the unit.

PASS is for everyone – it is not a remedial program for struggling students, but a program for all students who want to improve their performance.

More information about PASS sessions will be given in the first lecture, and through iLearn.

# Unit Schedule

| Week                  |   | Reading                                     |
|-----------------------|---|---|
|                       | <b><i>Formal propositional logic</i></b>                                  |   |
| Week 1<br>29 & 30/7   | Introduction; Propositions and Arguments<br><i>No tutorials this week</i> | Restall, Chapter 1                          |
| Week 2<br>5 & 6/8     | Translation: Connectives and argument forms                               | Restall, Chapter 2                          |
| Week 3<br>12 & 13/8   | Truth tables<br><i>First online quiz this week</i>                        | Restall, Chapter 3                          |
| Week 4<br>19 & 20/8   | Trees   | Restall, Chapter 4                          |
|                       | <b><i>Problems in the Philosophy of Logic (1)</i></b>                     |   |
| Week 5<br>26 & 27/8   | Vagueness and bivalence<br><i>Exercise 1 due this week</i>                | Restall, Chapters 5                         |
| Week 6<br>2 & 3/9     | Conditionality  | Restall, Chapter 6                          |
| Week 7<br>9 & 10/9    | Revision (Wednesday); Test (Thursday)<br><i>No tutorials this week</i>    |   |
|                       | Midsemester break   |   |
|                       | <b><i>Formal predicate logic</i></b>                                      |   |
| Week 8<br>30/9 & 1/10 | Introduction to predicate logic: predicates, names and quantifiers        | Restall, Chapter 8                          |
| Week 9<br>7 & 8/10    | Trees for predicate logic   | Restall, Chapter 10                         |
| Week 10<br>14 & 15/10 | Identity<br><i>Online quiz 2 this week</i>                                | Restall, Chapter 11 (excluding "Functions") |



|                       | <i>Problems in the Philosophy of Logic (2)</i>                            |                             |
|-----------------------|---|-----------------------------|
| Week 11<br>21 & 22/10 | Definite Descriptions<br>Non-existence<br><i>Exercise 2 due this week</i> | Restall, Chapters 12 and 13 |
| Week 12<br>28 & 29/10 | What is a predicate? What is logic?                                       | Restall, Chapters 14 and 15 |
| Week 13<br>4 & 5/11   | Revision (Wednesday); Test (Thursday)<br><i>No tutorials this week</i>    |                             |

## Learning and Teaching Activities

### Lectures

Internal students attend two lectures each week. These cover the required content for each week, but are also interactive, providing a forum for skills practice and discussion. External students will listen to or watch the lectures online, and should do the activities set in class while doing so.

### Tutorials

Students attend one tutorial each week. In tutorials, we will go through exercises from the text and discuss anything that students might be having trouble with. Some weeks involve more philosophical reflection on the course material. Attendance and participation are assessed.

### Reading and exercises

Each week, there will be reading set from the textbook. You can do this either before or after the lectures: whichever you find works best for you. There are exercises at the end of each chapter, some of which we will go through in tuts or PASS sessions, but any we don't get through should be attempted for extra practice. Exercise solutions will be posted online at the end of each week.

### Online resources

The website will contain lecture slides, audio/video lecture recordings, summaries and a discussion forum which you are encouraged to use. Additional resources will be posted online for you to make use of as you wish. This year, these will include further revision materials to assist students who need them, but also advanced materials for students who are interested in going beyond the required material.

### PASS sessions

PASS sessions are optional but highly recommended sessions, led by a trained student volunteer who performed well in this unit last year. The sessions are open to anyone who wants to attend. The PASS sessions will be used for further exercises and discussion. The sessions

are open to anyone who wants to attend. The PASS sessions will be used for further exercises and discussion. These are only available on-campus, but any external students who are able to make it are welcome.

## 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

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

#### Learning outcome

- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

#### Assessment tasks

- In-class test 1
- In-class test 2
- Participation

### Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

#### Learning outcome

- Understand and apply fundamental logical concepts

## Assessment task

- Participation

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

## Learning outcomes

- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.
- Demonstrate commitment to learning through regular engagement

## Assessment tasks

- In-class test 1
- In-class test 2
- Participation

## 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

- Translate between English and the language of propositional logic
- Use truth tables and variants to test formulas and arguments in propositional logic
- Use trees to test formulas and arguments in propositional logic
- Translate between English and the language of predicate logic.
- Use trees to test formulas and arguments in predicate logic
- Understand and apply fundamental logical concepts

- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## **Assessment tasks**

- Online quiz 1
- Exercise 1
- In-class test 1
- Online quiz 2
- Exercise 2
- In-class test 2
- Participation

## **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**

- Translate between English and the language of propositional logic
- Translate between English and the language of predicate logic.
- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## **Assessment tasks**

- Exercise 1
- In-class test 1
- Exercise 2
- In-class test 2
- Participation

## **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**

- Translate between English and the language of propositional logic
- Use truth tables and variants to test formulas and arguments in propositional logic
- Use trees to test formulas and arguments in propositional logic
- Translate between English and the language of predicate logic.
- Use trees to test formulas and arguments in predicate logic
- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## **Assessment tasks**

- Exercise 1
- In-class test 1
- Exercise 2
- In-class test 2
- Participation

## **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:

## **Learning outcomes**

- Understand and apply fundamental logical concepts
- Understand and explain some central problems in the philosophy of logic arising out of the formal methods studied, and some of the main responses to those problems.

## **Assessment tasks**

- Exercise 1
- In-class test 1
- Exercise 2
- In-class test 2
- Participation

## Changes from Previous Offering

Additional feedback for external students will be available this year.

## On-campus sessions

There will be two on-campus sessions for external students, on **Saturday 12th of September** and **Saturday 7th of November** from **10am-3pm**. Check the timetable or the external students' forum closer to those dates for confirmation of the location of the sessions.

All external students **must** attend from 2-3pm, to complete the in-class tests, each worth 30% of the assessment for the course.

On each of these days the morning sessions from 10am are optional but strongly recommended sessions for exercises, discussion, revision and test preparation.