



THE UNIVERSITY
of EDINBURGH

Logic 2: Modal Logics (Spring 2017)

COURSE DETAILS

Course Organizer: Anders J. Schoubye (anders.schoubye@ed.ac.uk)

Course Secretary: Sam Bell (sam.bell@ed.ac.uk)

SEMINARS

Mondays 10-12, Dugald Stewart Building, Room 1.20

OFFICE HOURS

Mondays 13-15, Dugald Stewart Building, Office 4.05

ASSESSMENT

The course will feature two take home exams and one final in-class exam. The first take home exam will count for 20 percent of the total mark for the course, the second for 30 percent, and the final exam for 50 percent.

- **Take Home Exam I** (20 percent):
Available: **Tuesday 28/2 12:00**. Due: **Thursday 2/3 15:00**
- **Take Home Exam II** (30 percent):
Available: **Tuesday 21/3 12:00**. Due: **Thursday 23/3 15:00**
- **Final Exam**: TBD (50 percent)
(2 hours, in class, closed book)

READINGS

Lectures will be based on Rod Gire's books *Modal Logics and Philosophy* (Acumen, 2009) and *Possible Worlds* (Acumen, 2003). You will need to acquire these books. We may read select papers throughout the term, but these will be made available on Learn when necessary.

EXERCISE SETS

Two sets of exercises will be made available around week 2-3 and week 4-5, cf. schedule below. These will not be marked, but it is important that you do them. I will have extra office hours dedicated to going over these. During these sessions, I will see students in groups of about five people for roughly one hour. The dates for the revision sessions are listed below.

Exercise Set 1 (group meeting): Friday 27/1, 10-14

Sign-up: <http://doodle.com/poll/ix3ks2yf7ab4hmk5>

Exercise Set 2 (group meeting): Wednesday 15/2, 10-14

Sign-up: <http://doodle.com/poll/nda9mzheekgtpreb>

You should make an effort to attend both of these. However, if you're unable to make these sessions, you can attend my normal office hours instead.

A NOTE ON DATES

Please note that two lectures in February have been rescheduled for different days as I am out of town on those particular days, cf. the schedule below. Exact time and location will be determined later.

CONTENT

The aim of the course is to cover a range of so-called modal extensions of classical propositional and first-order logic. Modal logic is traditionally characterized as the logic of necessity and possibility both of which are crucial notions in philosophy in general. However, the systems initially developed to provide rigorous explications of logical necessity and possibility (and contingency, impossibility, etc.) are also used to characterize a wide array of other central notions in philosophy, e.g. *knowledge*, *belief*, *obligation*, *permission*, *time*, and *change*.

In the first part of this course, we focus on the standard Kripke semantics for normal modal logics covering systems such as **K**, **T**, **B**, **S₄**, and **S₅** (including fragments of modal predicate logic). We will then briefly consider a range of so-called non-normal modal logics and then proceed to a discussion of natural deduction and axiomatic proof systems. In addition, various meta-theoretical results may be discussed.

In the second part of the course, we focus on extensions of modal logic, mainly temporal, epistemic, and deontic logic. We will explore how notions such as knowledge/belief and obligation/permission can be explicated in formal terms and how the resulting logics can be used to shed light on core philosophical problems. For example, we will use we will use epistemic logic to provide precise characterisations of important closure principles in epistemology and various paradoxes (e.g. Moore's paradox and Fitch's paradox of knowability) and deontic logic to characterise (and solve) some apparent puzzles about obligations and permissions.

SCHEDULE

	TOPIC	READINGS
	<i>Section I: Argument and Modality</i>	
Monday 16.1	Argument and modality Simple modal logics	Girle (2009), ch.1 Girle (2009), ch.2
Monday 23.1	Possible Worlds Normal modal logics	Girle (2003), ch.2 Girle (2009), ch.3
	EXERCISE SET I	
Monday 30.1	Natural deduction and axiomatics	Girle (2009), ch.5
Thursday 2.2	Modal predicate logic Note: 4-6pm, 1.416, Teaching room 9 Doorway 3, Medical School	Girle (2003), ch.3-4
	EXERCISE SET II	
Thursday 16.2	Modal predicate logic (cont.) Note: 4-6pm, 1.416, Teaching room 9 Doorway 3, Medical School	Girle (2003), ch.3-4
	<i>Section II: Applications</i>	
Monday 27.2	Conditional logic	Girle (2009), ch.6
	TAKE HOME EXAM I	

	TOPIC	READINGS
Monday 6.3	Temporal logic	Girle (2009), ch. 10
Monday 13.3	Doxastic and epistemic logic	Girle (2003), ch.6-7
Monday 20.3	Deontic logic	Girle (2009), ch.13
	TAKE HOME EXAM II	
Monday 27.3	TBD	
Monday 3/4	Revision Week	
	FINAL EXAM	