

University of St. Andrews

School of Philosophical and Anthropological Studies

Departments of Philosophy

PY1003: Introduction to Logic

Credits: 10.0

Semester: 2, 2005-6

Class Hour: 11 a.m. Tuesday and 11a.m. Friday, Physics B

Enrolment: 11 a.m. Tuesday, February 7th, 2006. Physics B

Description: This course is devoted to the analysis of arguments and inferences and introduces a set of formal methods for doing this. We constantly engage in reasoning from premises to conclusions. How is this possible? By what rules should this be done? What patterns and principles of inference are sound and what is meant by the notion of a sound principle? What are proofs and why are they important? We shall be looking at the semantics and proof theory of propositional and predicate logic in order to explicitly answer some of these questions. We shall also be greatly extending the study of techniques of formalization and formal methods of evaluating inferences. We shall lay great stress on some important notions along the way, such as consistency, validity, models and counterexamples. For further information you can check out the following web-site which has a nice essay on learning logic in St Andrews on it by a former student <http://www.standrews.ac.uk/saltire/studyskills/Winners2003.shtml>

Module coordinator and lecturers: Dr Carrie Jenkins (room 19.5, Arché Research Centre, 17-19 College Street; tel.: 461794; email: csj6) will be course coordinator. Dr Philip Ebert (room 17.5, Arché Research Centre, 17-19 College Street, tel.: 461775; email: pae1) and Dr Marcus Rossberg (room 19.4, Arché Research Centre, 17-19 College Street; tel.: 461779; email: mr30) will be course teachers. Any student is welcome to come and see us during our office hours about matters arising from lectures, tutorials or reading. Carrie Jenkins's office hours are Thursday 9-10 and 10-11, Philip Ebert's office hours are Monday 3-4 and Friday 10-11, and Marcus Rossberg's office hours are Thursday 10-12. For access to the Arché building, 17-19 College Street, please contact the staff member you intend to visit in advance by phone or email, or alternatively contact the Arché secretary, Ms Sharon Coull (room B03, Edgecliffe; tel.: 46 2480; email: sc27) for access. You are also very welcome to make an appointment to

see us at another time if you wish. Please do this through the School Secretary, Room G09, Edgecliffe, or by contacting us by telephone or by email.

Teaching: Two lectures per week Tuesday and Friday at 11.00am, plus weekly example classes (see timetable below) starting in the third week. There are eight example classes. You should attempt the example sheets before the class and your tutor will work through them with you each week. Example class work is not assessed but it is an absolutely integral part of the learning process in the course; if you attempt the sheets each week and learn the skills as we go along you will pass the course easily. The real motto is: do not get left behind, do the work as it comes along each week and you will find logic easy and rewarding. Do not miss lectures; if you keep up with the lectures you will find everything straightforward. If you don't go to lectures you will quickly get lost and fall behind, with inevitable consequences following on. Just do the work as it comes along.

Assessment

Continuous assessment (in the form of two class tests) = 50%

One and half hour examination = 50%

Requirements: Adequate reading and preparation are required as part of the work of the course. Regular attendance at examples classes is also a requirement. (For details of all regulations covering the course including those governing permission to proceed, see section six of the *Philosophy Sub-Honours Handbook*.) Please note that students are required to pass *both* the continuous assessment component (the two class tests) *and* the examination in order to pass the module as a whole.

Grading

17-20 Distinction/First Class

14-16 High Merit/Upper Second

11-13 Low Merit/Lower Second

8-10 Third

5-7 Pass

0-4 Fail

Reading and Course Texts: The course text is *Logic with Trees*, by Colin Howson (1997, Routledge ISBN 0145133424). Copies are available for purchase from Blackwells in the Union and also from <http://www.amazon.co.uk>. A limited number of copies are available in the short loan section of the Main Library. Other texts that you will find helpful are *Modern Logic* by

Graeme Forbes, *Formal Logic: Its Scope and Limits* by Richard Jeffrey and *Logic* by Wilfrid Hodges. Copies are available in the Main Library and in the Philosophy Library. Course materials will be available online at <http://www.st-andrews.ac.uk/~csj6/details/PY1003>.

Course Timetable

Week One

7th February: Enrolment (CJ, PE, MR)

10th February: Introduction – What is an argument? What is validity? Why logic? (CJ)

Week Two

14th February: Sentential Logic revisited I – formalisation (CJ)

17th February: Sentential Logic revisited II – truth-tables, validity,
tautologies, contradictions (CJ)

Week Three

21st February: Trees for Sentential Logic I – the rules for \vee , \wedge , \neg , \rightarrow , \leftrightarrow (CJ)

24th February: Trees for Sentential Logic II – the rules for negated formulae (CJ)

EXAMPLE CLASS 1: Sentential Logic revisited

Week Four

28th February: Trees for Sentential Logic III – consistency, tautology, contradiction (CJ)

3rd March: Trees for Sentential Logic IV – validity (CJ)

EXAMPLE CLASS 2: Trees for Sentential Logic I

Week Five

7th March: Trees for Sentential Logic V - summary (CJ)

10th March: Predicate Logic I – the existential quantifier (PE)

EXAMPLE CLASS 3: Trees for Sentential Logic II

Week Six

14th March: Predicate Logic II – the universal quantifier (PE)

17th March: CLASS TEST (CJ, PE, MR)

EXAMPLE CLASS 4: Predicate Logic

Week Seven

21st March: Trees for Predicate Logic I – the rules for quantifiers (PE)

24th March: Trees for Predicate Logic II – using both rules (PE)

27th March – 7th April: UNIVERSITY VACATION PERIOD

Week Eight

11th April: Interpretations and counterexamples (MR)

14th April: Many-place predicates (MR)

EXAMPLE CLASS 5: Trees for Predicate Logic I

Week Nine

18th April: Multiple generality (MR)

21st April: Identity (MR)

EXAMPLE CLASS 6: Trees for Predicate Logic II

Week Ten

25th April: Definite descriptions (MR)

28th April: Recapitulation: Sentential Logic (MR)

EXAMPLE CLASS 7: Interpretations and counterexamples; many-place predicates

Week Eleven

2nd May: Recapitulation: Predicate Logic (PE)

5th May: CLASS TEST (CJ, PE, MR)

EXAMPLE CLASS 8: Multiple generality; identity