Phil 210: *Introduction to Deductive Logic* *Autumn 2013*

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Lectures: Mondays and Wednesdays: 12:35–13:25. Adams Auditorium

Conference: 1 hour weekly—TBA (usually on Thursday or Friday).

Summary of Material. This course examines the main elements of *deductive logic*, one of the oldest and most important branches of philosophy, and which is primarily concerned with correctly deducing a *conclusion* from given *premises*, thus with what is often called *valid inference* or *argument* or *logical consequence* or (informally) 'following logically from'. The key ideas are introduced using a special language, FOL, which abbreviates 'first-order logic'. We develop this language first using a special case, where we have names for objects and then what we call *predicates* of those objects, corresponding to properties and simple relations. This gives rise to elementary sentences; we then look at some ways to connect them (with what we call *connectives*) to form more complex sentences. This yields what is often called (classical) *propositional logic*, an important part of logic expressed in a fragment of FOL. We give a precise definition of valid inference/logical consequence for this fragment; we then proceed to develop a *proof* or *deduction* system for this, i.e., a way of *deriving* logical consequences from given sentences as a starting point. (The proof/deduction system in effect is built on a small number of valid inferences, which can then be shown to yield *all* valid inferences.) selects a small Following this, we consider a more complex version of FOL, based on *quantifiers* and *variables*, which gives a correspondingly more complex means of expression, and along with this we expand to a correspondingly more complex system of *deduction*. (Again, a small number of valid inferences is selected, yielding *all* valid inferences.)

The exposition in the lectures will follow that of the textbook, which means that *the textbook is indispensable*, and regular reading of it is ESSENTIAL. Examples are to be found in abundance in the textbook, and should be worked through as a matter of **routine**, *without being instructed so to do*. The lectures will concentrate more on the *theoretical* side of the material rather than on examples; the exercises supply the examples. The aim is to understand *why* the mechanisms presented work, and not simply to be able to apply them. Correspondingly, a good proportion of the questions on the tests and assignments will be *theoretical* in nature. (***Please take note of this fact now!***) The questions on the exams and assignments will be somewhat similar in form to these. Some of them will be challenging, not just asking you to reiterate what you have learnt, but to use this in ways which at first might not be entirely familiar. Please note: *the final exam, worth 50% of the overall mark, will range over material from the whole course*.

Conferences: Formal logic is very much a subject where practice is essential, and where the exercises really instil familiarity with the material. In addition to the lectures, there will be one conference hour per week: the main purpose of these conferences will be to work through selected examples; **attendance at conferences is therefore strongly recommended**, and proper preparation for the conferences requires prior practice of the relevant exercises. *Note that conference size is limited; please sign-up promptly to get the time you desire.* Very early on, a guide to the course will be posted; this is to be regarded (as its title makes clear) as a *preliminary* schedule for the course. Nevertheless, it should be taken as a rough guide to the reading and the exercises you ought be doing at a given stage of the course.

Warning: Many students standardly find the second-half of the course much more difficult and complicated than the first part. Thus, finding the initial stages easy is not a sign that you will find the whole course so. Understanding the material is also by its nature cumulative; one cannot neglect the course for a few weeks, and then expect to understand the new material.

Handouts etc.:, Handouts, slides, assignments, mid-term exam will be distributed via *MyCourses*; announcements will also be distributed through the announcement/e-mail functions available there. Note that this system uses only your official McGill e-mail address, so this (and also *MyCourses*) should be checked regularly and routinely.

Reading Matter. The textbook for the course is:

- Barker-Plummer, Barwise, Etchemendy et al.: *Language, Proof and Logic. Second Edition.* (CSLI Publications).

This will be available from The Word Bookstore, 469 Milton Street (250 metres from the University Street Gates). **This text is essential. NB.** *Cheques and cash only; no credit cards.*

Software The CD also contains software essential for many of the exercises. There are 4 software programs which are to used to practice various aspects of the course, and a bank of files based on these programs. (The disc also contains a PDF copy of the software manual, as well as of the textbook itself.) The computer-based exercises standardly begin with one of these files, and your solutions to many of the exercises can be checked by submitting

them to an on-line marker, which you'll be encouraged to use. It is also strongly advised: (a) to copy the disc to your hard-drive, and/or onto the hard-drive space made available to you through McGill's computers; (b) make a careful note of the registration number on the CD, to be kept in a safe place (perhaps also e-mailed to yourself); (c) make a disc-copy of the CD for safe keeping; and (d) arrange for regular computer time in case you do not possess your own computer. Please read carefully the section *Essential Instructions about Homework Exercises*, pp. 5–10 of the book. (**IMPORTANT**: Please specify only your **OWN** e-mail address for the 'Submit' function.)

Marking and Assessment There will be two assignments, worth 12.5% each; one take-home mid-term test worth 25%; one formal, final exam worth 50%. *Extensions to deadlines set will be granted only in* ***very exceptional*** *circumstances, usually only for medical reasons and with a medical note, or for other, similar emergencies, appropriately documented.* **Please keep copies of work submitted.** $\underline{\mathcal{NB}}$

Policy for Late Work Late work will be penalised at the rate of a third of a full letter grade (or about 5%) per day overdue. Thus an assignment judged to be a B+ (or around 77%) but late one day will be assigned B (or 72%), late two days B− (67%), and so on. $\underline{\mathcal{NB}}$ $\underline{\mathcal{NB}}$

McGill Policies

1. *McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures. (See* `www.mcgill.ca/integrity` *for more information.)* $\underline{\mathcal{NB}}$

2. *In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change*.

3. *Students have the right, without seeking permisson, to submit work in French.*.