New College of the Humanities

LOGIC Course Guide

Course	Logic: Formal and Philosophical	Faculty	Philosophy
Course code	NCH414	Course Leader	Dr Ioannis Votsis
Credits points	30	Author	Dr Brian Ball and Dr Ioannis Votsis
FHEQ level	Level 4	Date approved	
Core/optional	Core	Date modified	September 2019
Pre-requisites	None		

WELCOME

Welcome to Logic at NCH! We hope that you will thrive on this course and that it will help inform and improve your other studies too. Students often approach the study of logic with trepidation, only to find that it's the course they like best as it helps make learning philosophy easier. If you have any questions or concerns about the course don't hesitate to raise them with the course leader either by email (ioannis.votsis@nchlondon.ac.uk) or in person.

DESCRIPTION

This course introduces students to the languages and tools of classical elementary logic and addresses questions about the relations between formal and natural languages. It cultivates students' ability to translate complex natural language passages into formal claims and arguments, to assess their validity, and to engage with the further topics of: analyticity, apriority, necessity, descriptions, existence, identity, truth, meaning and reference. The course provides a strong foundation in philosophical knowledge and methodology for the later years of the degree. The course is divided into two parts. The first part covers Philosophical Logic and the second part covers Formal Logic.

AIMS

The course aims to:

- Provide a strong foundation in elementary formal logic, as well as philosophical methodology (especially relevant to the metaphysics module in year 2).
- Develop students' engagement with central logical vocabulary and techniques of formalization and philosophical questions surrounding the representation of arguments and reasoning.
- Promote an active understanding of the primary philosophical issues surrounding such logical notions as truth, meaning, reference, analyticity, apriority, necessity, descriptions, identity, and existence.

LEARNING OUTCOMES

On successful completion of the course, students should be able to:

KNOWLEDGE AND UNDERSTANDING

K1a Show knowledge and understanding of the techniques of formal logic and of key questions and debates in philosophical logic. (K1a PPE), (K1a PPH)

K1a Show familiarity with the theories of philosophers such as Quine, Russell, Kripke, and Lewis, amongst others.

K3a Show familiarity with the vocabulary of formal logic. (K1a PPE), (K1a PPH)

SUBJECT-SPECIFIC SKILLS

S1a Interpret and engage clearly with key notions involved in such formalization (e.g. truth, meaning, reference, etc.).

S2a &S3a Grasp the techniques of elementary formal logic, and of the formalization of natural language arguments. (S1a PPE), (S1a PPH)

TRANSFERABLE SKILLS

T1a & T2a Work independently, effectively, and to deadlines.

T3a Produce clear and persuasive presentations (especially written). (T2a PPE), (T2a PPH)

LEARNING AND TEACHING PLAN

The course is taught through participatory lecture-seminars and individual tutorials. Lecture-seminars are designed to enable independent reading and research and to encourage lively, structured, discussion. After the material has been covered there will be two mock examinations on which you will receive focused feedback. There will also be a revision session.

In the formal logic part of the course, a polling app is employed to allow interactive engagement with the students. Moreover, in the same part of the course, students may be urged to use software and/or an app to practice their skills solving formal logic

exercises. The polling app, called 'Poll Everywhere', is free and available for both Android and iOS devices. A browser can also be used to join polls via https://pollev.com/. More info on how to use the app can be found here: https://www.polleverywhere.com/pollev.

Further course information and PDFs of (some) set readings are available through the Moodle VLE 'Logic' page, to support structured independent reading and research.

Students are required to attend and participate in all timetabled sessions for this course. Students are also expected to engage in independent study, informed and structured by the regular assignments.

In what follows, reading indicated as 'Essential' is obligatory. 'Further' reading is strongly advised when students are writing formative essays on a given topic, or during revision of a topic in preparation for the final, summative exam. In the philosophical logic part of the course, reading indicated as 'Introductory' is optional: students should read as much of it as they feel is necessary in order to understand the essential reading; in practice, this is likely to be most or all of it.

FEEDBACK

Students will receive oral feedback in lecture-seminars and in individual tutorials. The latter will concern formative essays and formal logic exercises. Students wishing to obtain written feedback on their exercises and essays must submit their work on time. See your individualised assessment planner for details on deadlines. Students may also obtain feedback during optional drop-in sessions; and their collection will provide an opportunity to discuss their progress in the course.

TEACHING SCHEDULE

Michaelmas Term **PHILOSOPHICAL LOGIC**		
Week	**Topic**	**Essential Reading** ***(Articles and Chapters)***
1	**The Analytic/Synthetic Distinction**	Quine (1951) 'Two Dogmas of Empiricism'.
2	**The Analytic/Synthetic Distinction: Discussion**	Grice and Strawson (1956) 'In Defence of a Dogma'.
3	**Truth**	Glanzberg (2018) 'Truth', sections 1-3.

Michaelmas Term PHILOSOPHICAL LOGIC		
Week	**Topic**	**Essential Reading** ***(Articles and Chapters)***
4	**Truth: Discussion**	Russell (1912) chapter 12.
5	**Modality and Possible Worlds**	Lewis (1973) *Counterfactuals*, section 4.1.
6	**Modality and Possible Worlds: Discussion**	Kripke (1980) *Naming and Necessity*, preface.
7	**READING WEEK**	
8	**Naming and Rigidity**	Kripke (1980) *Naming and Necessity*, lecture I.
9	**Naming and Rigidity: Discussion**	Kripke (1980) *Naming and Necessity*, lecture II.
10	**Essence and Transworld Identity**	Kripke (1980) *Naming and Necessity*, lecture III, and preface.
11	**Mock Exam I**	
12	**Collections**	

Hilary Term		
Week	**Topic** **FORMAL LOGIC**	**Essential Reading / Exercises**
1	**The Syntax of Propositional Logic**	Halbach (2010) chapter 1 (Sections 1.5-1.6) and chapter 2 (Sections 2.1 –

Hilary Term		
Week	**Topic** **FORMAL LOGIC**	**Essential Reading / Exercises**
		2.3).
2	**The Semantics of Propositional Logic**	Halbach (2010) chapter 2 (Section 2.4) and chapter 3.
3	**Solving Exercises in Class: Set 1**	Halbach's Exercises Booklet, exercises 1.7-1.8, 2.2, 2.6, 3.1, 3.4-3.5.
4	**Derivations in Propositional Logic**	Bergmann, Moor and Nelson (2014) chapter 5 (sections 5.1-5.3).
5	**Solving Exercises in Class: Set 2**	Bergmann, Moor and Nelson (2014), chapter 5, exercises 5.1.1E (1a-c, 2a-c), 5.1.2E (1a-b, 2a-c), 5.3E (1a, 2a, 5a).
6	**The Syntax of Predicate Logic with Identity**	Halbach (2010) chapter 4.
7	**READING WEEK**	
8	**Sets and Relations**	Halbach (2010) chapter 1 (sections 1.1 – 1.4).
9	**The Semantics of Predicate Logic with Identity**	Bergmann, Moor and Nelson (2014) chapter 8 (Sections 8.1 –

Hilary Term		
Week	**Topic** **FORMAL LOGIC**	**Essential Reading / Exercises**
		8.4).
10	**Solving Exercises in Class: Set 5**	Halbach's Exercises Booklet, exercises 1.4-1.5, 4.1, 4.3-4.4, 5.1 (i-ix).
11	**Mock Exam II**	
12	**Collections**	

Please refer to your CELCAT timetable for exact dates and times of lecture-seminars, tutorials, assignment deadlines and the exam. *Your tutorials will be scheduled to fit with the assignment deadlines.*

ASSESSMENT

FORMATIVE

There are four formative assignments with associated individual tutorials. The assignments consist of two 1500-word essays on Philosophical Logic topics plus two sets of exercises (#3 and 4) on Formal Logic topics.

Regular formative assignments (essays/exercises) prompt focused independent study and are important to develop the student's active understanding of what they have learnt in lectures and to improve their grasp of key logical techniques and concepts.

Students should note that the reading that is relevant to a given week's formative assignment may not be the reading associated with that same week's scheduled lecture, but is rather that associated with the lecture(s) on the topic(s) of the seminar or tutorial.

Please refer to the 'formative and summative assessment planner' for **SUBMISSION DATES** of your formative and summative assignments. **Essay deadlines** in philosophical logic **may be prior to the week of the tutorial** devoted to them – please check your planner!

Note: There are three other sets of formal logic exercises (#1, 2 and 5) that students are expected to solve and present but are not expected to submit for marking and correction. Solutions to these will be discussed in specially designated lecture-seminars. See the Hilary term schedule above for details.

No.	Assignment Type	Details	Length
FA1/ AE1	*Essay/Presentation/Question set/Other*	*Title/Other*	*xx words/xx minutes*
FA1	Formative Essay	Write an essay on EITHER: (Q1) Is there an important and viable distinction between analytic and synthetic truths? OR (Q2) "Truth consists in correspondence with the facts" – do you agree? If so, why? If not, why not?	1500 words
FA2	Formative Essay	Write an essay on ONE OF: (Q3) What are possible worlds? Are there any? OR (Q4) Are names rigid designators? What, if anything, does your answer tell us about the prospects for the descriptive theory of names? OR (Q5) Are any of your properties essential to you? Could you exist in a world in which your parents never met?	1500 words
FA3	Formal Logic Exercise Set 3	Bergmann, Moor and Nelson (2014), chapter 5, exercises 5.1.1E (1d-f, 2d-f), 5.1.2E (1c-d, 2d), 5.3E (1b-c, 2b-c, 5b-c).	N/A

FA4	Formal Logic Exercise Set 4	Bergmann, Moor and Nelson (2014), chapter 8, exercises 8.1E (2b-e), 8.2E (1b-e), 8.3E (1b-e), 8.4E (1b-d).	N/A

SUMMATIVE ASSESSMENT: EXAM

The only summative assessment for this course is an exam that is scheduled to take place in the Trinity term. Details relating to the format of the exam including a sample exam can be found in the sections below.

Past examination questions can be found in the NCH External Examiner Reports section, on the Faculty Homepage, on Moodle.

READING

(See also the above Schedule of Lecture Topics and Reading)

All of the required – also called 'essential' – reading for the course is listed above (see the schedule of lecture topics and reading in the Learning and Teaching Plan section as well as the prefatory remarks in the section on Formative Assessment); full bibliographical details of these and other potentially useful works are below.

Halbach's Logic Exercises Booklet can be here: http://logicmanual.philosophy.ox.ac.uk/.

KEY TEXT BOOKS

Bergmann, M., J. Moor and J. Nelson (2014) *The Logic Book*. 6th edition, New York: McGraw Hill.

Halbach, V. (2010) *The Logic Manual.* Oxford: Oxford University Press.

Kripke, S. (1980) *Naming and Necessity*. Oxford: Blackwell.

FURTHER READING

MICHAELMAS TERM: PHILOSOPHICAL LOGIC

Topic: The Analytic/Synthetic Distinction

Kripke (1980) Naming and Necessity, pp. 34-39.

Williamson, T. (2007) The Philosophy of Philosophy. Oxford: Blackwell, chapters 3-4.

Introductory Reading:

Grayling, A.C. (1997) *An Introduction to Philosophical Logic*. 3rd edition, Oxford: Blackwell, chapter 3, especially pp. 33-4.

Topic: Truth

Blackburn, S. (2018) *On Truth*. Oxford: Oxford University Press.

Haack, S. (1976) 'The Pragmatist Theory of Truth', *The British Journal for the Philosophy of Science*, vol. 27(3): 231–49.

Introductory Reading:

Kirkham, R. L. (2001) *Theories of Truth: A Critical Introduction*, MIT Press.

Topic: Modality and Possible Worlds

Lewis, D.K. (1986) On the Plurality of Worlds. Oxford: Blackwell, sections 1.1-1.2.

Stalnaker, R. C. (1976) 'Possible Worlds', *Noûs*, 65-75.

Introductory Reading:

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, section 5.1.

Topic: Naming and Rigidity

Frege, G. (1892) 'On Sense and Reference' (any translation).

Mill, J.S. (1843) 'Of Names', in *A System of Logic* (any edition).

Soames, S. (1998) 'The modal argument: wide scope and rigidified descriptions', *Noûs*, 32(1): 1-22.

Stanley, J. (1997) 'Names and Rigid Designation', in Hale and Wright (eds.), *A Companion to the Philosophy of Language*. Oxford: Blackwell.

Introductory Reading:

Cumming, S. (2013) 'Names', *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Spring 2013. Metaphysics Research Lab, Stanford University.

https://plato.stanford.edu/archives/spr2013/entries/names/

Laporte, J. (2016) 'Rigid Designators', *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Spring 2016. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/spr2016/entries/rigid-designators/

Topic: Essence and Transworld Identity

Lewis, D.K. (1968) 'Counterpart Theory and Quantified Modal Logic', *Journal of Philosophy*, 113-126.

Williamson, T. (2002) 'Necessary Existents', in O'Hear (ed.), *Logic, Thought and Language*. Cambridge: CUP.

Introductory Reading:

Grayling, A.C. (1997) *An Introduction to Philosophical Logic*. 3rd edition, Oxford: Blackwell, chapter 3, especially pp.49-81.

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, sections 5.3-5.11.

HILARY TERM: FORMAL LOGIC

Topic: The Syntax of Propositional Logic

Bergmann, Moor and Nelson (2014) *The Logic Book*, chapters 1-2.

Grayling, A.C. (1997) *An Introduction to Philosophical Logic*. 3rd edition, Oxford: Blackwell, chapter 2.

Papineau, D. (2012) *Philosophical Devices*. Oxford: Oxford University Press, chapter 10.

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, chapter 1.

Topic: The Semantics of Propositional Logic

Bergmann, Moor and Nelson (2014) *The Logic Book*, chapter 3.

Hodges, W. (2001) *Logic: An Introduction to Elementary Logic*, 2nd edition, London: Penguin Books, sections 16-18, 23-24.

Papineau, D. (2012) *Philosophical Devices*. Oxford: Oxford University Press, chapter 10.

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, chapter 2.

Topic: Derivations in Propositional Logic

Halbach (2010) *The Logic Manual*, chapter 6 (Section 6.1).

Hodges, W. (2001) *Logic: An Introduction to Elementary Logic*, 2nd edition, London: Penguin Books, sections 9-11, 19-22, 25.

Topic: The Syntax of Predicate Logic with Identity

Bergmann, Moor and Nelson (2014) *The Logic Book*, chapter 7.

Hodges, W. (2001) *Logic: An Introduction to Elementary Logic*, 2nd edition, London: Penguin Books, sections 34-38.

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, chapter 4 (sections 4.1, 4.3-4.15).

Topic: Sets and Relations

Machover, M. (1998) *Set Theory, Logic and their Limitations*, Cambridge: Cambridge University Press.

Papineau, D. (2012) *Philosophical Devices*. Oxford: Oxford University Press, chapter 1.

Topic: The Semantics of Predicate Logic with Identity

Halbach (2010) *The Logic Manual*, chapter 5.

Bergmann, Moor and Nelson (2014) *The Logic Book*, chapter 8 (sections 8.5-8.6).

Hodges, W. (2001) *Logic: An Introduction to Elementary Logic*, 2nd edition, London: Penguin Books, section 39.

Papineau, D. (2012) *Philosophical Devices*. Oxford: Oxford University Press, chapter 1.

Sainsbury, R.M. (2001) *Logical Forms*. 2nd edition, Oxford: Blackwell, chapter 4 (section 4.2).

OTHER READING SOURCES

Students are encouraged to make use of the *Stanford Encyclopedia of Philosophy* (http://plato.stanford.edu), or SEP, and the *Internet Encyclopedia of Philosophy* (https://www.iep.utm.edu/), or IEP - both excellent online resources. Further suggestions are also available from the course leader on request.

MOCK EXAMS

Students are strongly advised to take the mock exams as they prompt consolidation and synthesis of what they have learnt and allow them to focus on written clarity and precision. There will be two mock exams, each of which will be one hour long. The first will cover material from the Philosophical Logic part of the course and will be conducted in week 11 of Michaelmas term. The second will cover material from the Formal Logic part of the course and will be conducted in week 11 of Hilary term.

APPENDIX 1 GRADE MARKING SCALE

Generic Grading Criteria Marking Band*	Grade Mark	Numeric Equivalent
Exceptional in most / all aspects, substantially exceeding expectations for this level	A1	100
	A2	92
Excellent quality, exceeding expectations for this level in many aspects	A3	83
	A4	74
Meets all the intended learning outcomes and exceeds the threshold expectations for this level in several of them	B1	68
	B2	65
	B3	62
Meets all the intended learning outcomes and exceeds the threshold expectations for this level in some of them	C1	58
	C2	55
	C3	52
Meets all the intended learning outcomes at, but rarely exceeding the threshold expectations for this level	D1	48
	D2	45
	D3	42
Fails to meet all of the intended learning outcomes and is marginally inadequate for this level	F1	35
Fails to meet all of the intended learning outcomes and is inadequate for this level	F2	20
	F3	15
Submitted	S	1
Non-submission	N	0

APPENDIX 2 GENERIC GRADE CRITERIA

GENERIC CRITERIA LEVEL 4						
KNOWLEDGE AND UNDERSTANDING						
A1/A2	**A3/4**	**B1/B2/B3**	**C1/C2/C3**	**D1/D2**	**F1**	**F2/F3**
Exceptional breadth and depth for work at this level.	Accurate and coherent in breadth, with depth in many areas.	Accurate in breadth, with depth in several areas.	Accurate, with depth in some aspects.	Largely accurate across most areas, with limited depth.	Inaccuracies/omissions in some areas, depth limited.	Substantial inaccuracies, omissions, irrelevancies.
Excellent understanding of concepts/theories (some of them abstract) and/or current practice, and several of their applications and implications.	Thorough understanding of concepts and theories (some of them abstract) and/or current practice, and some of their implications and applications.	Clear understanding of concepts and theories (some of them abstract) and/or practice and some of their implications and applications.	Satisfactory understanding of the relevant concepts, theories and/or practice; Shows some ability to deal with unfamiliar and abstract ideas.	Adequate understanding of the main concepts, theories, and/or practice; Engagement with unfamiliar/ abstract ideas or implications and applications is slight.	Occasional errors in understanding of main concepts, theories and/or practice; Struggles to engage with unfamiliar/ abstract ideas and complexities.	Substantial errors in understanding of concepts, theories and/or practice, or none.

GENERIC CRITERIA LEVEL 4						
SUBJECT SPECIFIC						
A1/A2	**A3/A4**	**B1/B2/B3**	**C1/C2/C3**	**D1/D2**	**F1**	**F2/F3**
Selects and applies appropriate methods to address/solve complex and often unfamiliar and unpredictable problems.	Applies appropriate methods to address/solve complex issues/problems, some unfamiliar/ Unpredictable.	Uses appropriate given methods to address complex issues/ problems, some unfamiliar /unpredictable.	Uses given methods to analyse issues/ problems, some unfamiliar /unpredictable and complex.	Analysis using given methods is adequate.	Superficial analysis.	Analysis absent or with significant errors/ Omissions.
Exceptional judgement in selection, analysis and evaluation of information and application of learning to different contexts.	Exercises judgement in selection, analysis and evaluation of information and application of learning to a different context.	Exercises judgement in selection and analysis of information, with some evaluation, and application of learning in a different context.	Satisfactory selection and analysis of information, with little evaluation; Applies some aspect of learning in a different context.	Limited ability to apply learning to complex, unfamiliar or unpredictable contexts or issues.	Some failure to apply learning complex, unfamiliar or unpredictable issues/contexts.	Fails to apply learning.
Excellent investigative skills generate well-founded and evidenced conclusions /practical solutions.	Thorough investigation generates well-founded conclusions/practical solutions.	Investigation generates well-founded conclusions /practical solutions.	Investigation generates some conclusions/ practical solutions.	Tendency to description and reliance on familiar/ given methods and approaches.	Overly descriptive and reliant on familiar/given material or approaches.	Descriptive and heavily reliant on very restricted range of given/familiar material and approaches, poorly understood.
Explores and	Explores and	Locates and	Locates and	Locates and	Range of	Range of

GENERIC CRITERIA LEVEL 4						
SUBJECT SPECIFIC						
A1/A2	**A3/A4**	**B1/B2/B3**	**C1/C2/C3**	**D1/D2**	**F1**	**F2/F3**
evaluates information/ideas from a wide range of sources (may include primary sources).	deploys information from a wide range of mostly secondary sources.	organises a wide range of information/evidence.	organises a satisfactory range of information/evidence, some of it beyond the given/familiar.	organises an acceptable range of information/evidence mostly from given/ familiar secondary sources.	information limited to the familiar/ given with some errors in organisation.	information inadequate and disorganised.
Competence in all the required specialised practical, technical, creative, scholarly or work-related skills. exceeds expectations for this level.	Competence in all the required specialised practical, technical, creative, scholarly or work-related skills, exceeds expectations for this level in some aspects.	Competently uses all the required specialised practical, technical, creative, scholarly or work-related skills, with indications of more developed ability in some areas.	Competently uses all of the required specialised practical, technical, creative, scholarly or work-related skills, with more developed capability in at least one area.	Use of all the required specialised practical, technical, creative, scholarly, or work-related skills is adequate.	Use of some of the required specialised practical, technical, creative, scholarly or work-related skills is inadequate.	Inadequate use of many/all of the required specialised practical, technical, creative, scholarly or work related skills.

GENERIC CRITERIA LEVEL 4						
TRANSFERABLE SKILLS						
A1/A2	**A3/A4**	**B1/B2/B3**	**C1/C2/C3**	**D1/D2**	**F1**	**F2/F3**
Excellent presentation and organisation of work and lucid communication in all contexts.	Excellent presentation and organisation of work and lucid communication in most contexts.	Presentation and organisation of work appropriate to context and purpose, communication clear.	Satisfactory organisation and presentation of work, communications mostly appropriate to the context/purpose.	Organisation and presentation of work and communications adequate in most contexts; some mistakes/irrelevancies.	Elements of disorganisation/ poor presentation/ poor or inappropriate communication or expression.	Work is disorganised, poorly presented with poor inappropriate communication and expression.
Exemplary referencing/citation.	Extensive, accurate referencing/citation.	Referencing consistent and accurate.	Referencing mostly consistent/accurate.	Some errors in referencing.	Errors/omissions in referencing, or none.	Substantial errors in referencing, or none.
Work demonstrates independence and initiative beyond level expectations, setting objectives and taking responsibility for outcomes.	Work demonstrates independence and some initiative in setting objectives and taking responsibility for outcomes.	Work demonstrates independence in setting some objectives beyond those given and taking responsibility for outcomes.	Work demonstrates satisfactory independence in addressing objectives and taking responsibility for outcomes.	Work demonstrates adequate independence in taking responsibility for outcomes.	Work demonstrates insufficient independence in attempting to address given objectives and taking responsibility for outcomes.	Work fails to address objectives and take responsibility for outcomes.
Evidences developed team-working and indications of leadership ability.	Evidences developed team-working skills.	Evidences a high level of team-working skills.	Evidences team-working and basic leadership skills.	Tendency to rely on support/direction from others.	Over-reliance on support/direction from others.	Fails to engage in /shows deficiencies in team working.

GENERIC CRITERIA LEVEL 4						
TRANSFERABLE SKILLS						
A1/A2	**A3/A4**	**B1/B2/B3**	**C1/C2/C3**	**D1/D2**	**F1**	**F2/F3**
Critical reflection/self-evaluation exceptional for this level.	Reflection and self-evaluation often critical and insightful.	Reflection generates a number of critical insights.	Satisfactory reflection with some insights.	Limited reflection with few insights	Minimal reflection lacks insight.	Reflection inadequate/absent with no insight.