HANDBOOK

for the undergraduate course in

MATHEMATICS AND PHILOSOPHY

2007 – 2008

Joint Committee for Mathematics and Philosophy

UNIVERSITY OF OXFORD

General advice about using e-mail

The IT support staff in your college will set up an e-mail account for you. You are strongly advised to use it and to check it regularly (at least once a day) since important information about courses is sent out by e-mail and tutors counts on being able to make teaching arrangements by e-mail using University e-mail addresses. If you wish to continue using the e-mail address you were using before coming to Oxford you must set up an automatic forwarding facility from your Oxford University address—and check that it works—so that messages to that address reach you. Do not let your in-box accumulate messages beyond your user allocation so that you are always able to receive new mail.

Handbook
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1. About this Handbook and other sources of information

This Handbook is issued to all undergraduates reading Mathematics and Philosophy and gives information, advice and guidance about the course during your time here at Oxford. It should be read in conjunction with two publications which together stipulate the content of the course. One is the *University of Oxford Examination Regulations* (commonly referred to as the Grey Book on account of the colour of its binding). The other is the *Handbook for the Undergraduate Mathematics Courses* published, with Supplements, by the Mathematical Institute. The Mathematics Handbook and its Supplements are referred to collectively in this Handbook as the *Mathematics Course Handbook*. It specifies and describes in detail the mathematics component of the joint course, its aims and objectives, structure and specific content. The Supplements, issued as separate booklets available from the Mathematical Institute, cover the following: Honour Moderations in Mathematics, Honour School of Mathematics Part A and a separate booklet for Honour School of Mathematics and Philosophy Part A, Honour Schools of Mathematics and of Mathematics and Philosophy Part B, Honour Schools of Mathematics and of Mathematics and Philosophy Part C, and Mathematics Projects. The relevant portions of the *Examination Regulations* 2007 are "Special regulations for Honour Moderations in Mathematics and Philosophy", pp. 99-101; "Special regulations for Preliminary Examination in Mathematics and Philosophy", pp. 137-137 (available if a candidates fails or fails part of Honour Moderations in Mathematics and Philosophy or misses that examination through illness or other justified cause), "Special regulations for the Honour School of Mathematics and Philosophy", pp. 349-353, "Special regulations for Philosophy in all Honour Schools including Philosophy", pp. 423-431.

They are available on the web. The Handbook for Mathematics and Philosophy is at: http://www.philosophy.ox.ac.uk/handbooks/ . The Mathematics Course Handbook and Supplements are at http://www.maths.ox.ac.uk/current-students/undergraduates/ , which also has a link to this Handbook. The Examination Regulations are at http://www.admin.ox.ac.uk/examregs/ .

Other publications that give information relevant to the course include the following: Lecture lists for Mathematics and for Philosophy each term are available in the week before term and respectively on the Mathematics and the Philosophy websites. Printed copies are distributed to students by college tutors. The Mathematics list contains a section for the Mathematics and Philosophy course which lists for Mods and each Part of Finals the lectures both in Mathematics and in Philosophy for subjects that are compulsory or particularly relevant for that examination. A Philosophy Lectures Prospectus is published at the beginning of each term and gives a synopsis for each course and its intended audience. The Philosophy Lecture List and Prospectus for each term is available at http://www.philosophy.ox.ac.uk/links/lectures.shtml

Further sources of information to do with examinations are the following: past exam papers, available at http://www.oxam.ox.ac.uk , Examiners Notices to candidates, available at http://www.maths.ox.ac.uk/notices/undergrad/ , Examiners' reports available at http://www.maths.ox.ac.uk/notices/exam-reports/ and at http://www.philosophy.ox.ac.uk/past_papers/FHS_reports/ Other generally relevant information can be found in the Philosophy and the Mathematics websites, at http://www.philosophy.ox.ac.uk and http://www.maths.ox.ac.uk . Undergraduates should also read the *Proctors' and Assessor's Memorandum* for guidance about the University's facilities and requirements which affect students generally, on the web at http://www.admin.ox.ac.uk/proctors/info/pam/index.shtml .

Please address queries or comments about the Mathematics and Philosophy course to the Chairman of the Joint Committee for Mathematics and Philosophy, who in 2006-7 is Daniel Isaacson, Faculty of Philosophy, 10 Merton Street, Oxford OX1 4JJ, daniel.isaacson@philosophy.ox.ac.uk.

2. The Course in Mathematics and Philosophy

(a) Nature of the Course

The joint course in Mathematics and Philosophy provides the opportunity to attain high levels of two quite different kinds of widely applicable skills. Mathematical knowledge and the ability to use it is a key element in tackling quantifiable problems and the most highly developed means of obtaining knowledge through purely abstract thinking, while philosophical training encourages the ability to analyze issues, often by questioning received assumptions, and to articulate that analysis clearly. Historically, there have been strong links between mathematics and philosophy. Philosophy of mathematics bridges the two subjects and has been of major importance to major philosophers (Plato, Aristotle, Kant, Frege, Russell, Wittgenstein) and to major mathematicians (Pythagoras, Bolzano, Cantor, Poincaré, Hilbert, Weyl, Brouwer). There are some (Descartes and Leibniz, notably) who have been both major philosophers and major mathematicians. Logic, the systematic study of reasoning, is also a bridge between the two subjects; it has been a branch of philosophy since Aristotle, and a branch of mathematics since the nineteenth century. The Oxford degree in Mathematics and Philosophy provides a strong background from which to pursue diverse careers or professional trainings upon completing the course, including graduate study in either mathematics or philosophy.

For the Aims and Objectives of undergraduate Mathematics courses in Oxford University, see the *Mathematics Course Handbook*, I, 1.2. In section I 1.2.1 are the Programme Outcomes together with teaching learning and assessment strategies for the mathematics courses.

For Aims and Objectives for Philosophy in all undergraduate courses with Philosophy in Oxford University see Appendix B of this *Handbook*.

(b) Structure of the Course; 3-year and 4-year degree

The Oxford course in Mathematics and Philosophy may be studied over three years, leading to the degree of Bachelor of Arts (B.A.) in Mathematics and Philosophy, or over four years, leading to the degree of Master of Mathematics and Philosophy (M,Math.Phil.). So long as your exam results in Parts A + B together are of honours standard you have the option either to leave with an honours B.A. or go on to the fourth year for the M.Math.Phil. No application for permission to go on to Part C is required. However, colleges need to know by December of the preceding year when they are admitting new students for the following year how many places they can offer, and candidates for Part B are asked to say in Michaelmas Term of the Third year whether they intend to go on to Part C.

There is a Joint Committee for Mathematics and Philosophy, consisting of members drawn from the Mathematics Faculty and the Philosophy Faculty, which has responsibility for the course. The syllabus is specified in examination regulations set by the joint committee with agreement of the Mathematics Faculty and Philosophy Faculty and various higher bodies of the University. The regulations determine the examinations for this course and the subjects to be examined. The University conducts the examinations through appointed examiners, who mark the scripts and any submitted work of candidates, and determine classifications. The University awards degrees on the basis of examination results. Teaching is provided both by the University (lectures and classes) and by the colleges (tutorials and classes). The colleges provide accommodation, meals, pastoral care, and an academic community within

which undergraduates can thrive and develop.

The examinations for each undergraduate degree course in Oxford consist of a First Public Examination and a Final Honour School (also sometimes just called 'Finals', or 'Honour School'). The First Public Examination may be classified, i.e. candidates who pass may earn an honours classification of First, Second, or Third (in which case it is called Honour Moderations, Honour Mods for short), or unclassified, i.e. Pass/Fail, though usually also with the possibility of award of a Distinction, in which case it is called a Preliminary Examination (Prelims for short) or (as in Physics and Philosophy) Moderations (as opposed to Honour Moderations). Study for a First Public Examination can be as brief as two terms (Preliminary Examination in PPP) or as extensive as five terms (Honour Moderations in Classics). The First Public Examination in Mathematics and Philosophy is an Honour Moderations, taken after three terms of study, i.e. at the end of the first year.

At the end of your second year you will take Part A, which examines only Mathematics. At the end of your third year you will take Part B, which examines Mathematics studied in your third year, B1 Foundations (which you are recommended to have studied in your second year) and Philosophy (studied in your second and third years). You will then be assessed based on your performances in the Part A and Part B examinations. So long as your performance in Part A and Part B is of Honours standard you may proceed to Part C (fourth year of the course) where you may choose between being examined entirely in Mathematics, entirely in Philosophy, or in both. Upon successful completion of Part C you will be awarded the degree of M.Math.Phil. A candidate who is adjudged worthy of Honours in Parts A and B together may choose not to go on to Part C and instead take an Honours degree of B.A. in Mathematics and Philosophy. From 2007 onwards all Maths and Phil candidates in Part B, not just those taking the B.A., will be given a classification, and from 2008 candidates who proceed to the fourth year of the course will receive a separate classification for performance in Part C.

Part A consists of three papers of 2 ¼ hours duration, each with the weight of a 2 hour paper (the additional ¼ hour is to give time to settle into the exam) so a combined weight of two three-hour papers. Part B consists of six three-hour papers or equivalent. Part C consists of three units, which may be all in Philosophy, all in Mathematics, or split two and one either way. A unit in Mathematics is generally examined in one three hour paper (based on 32 hours of lectures and 12-14 hours of inter-collegiate classes) whereas a unit in Philosophy is examined in one three hour paper (based on eight tutorials) plus a 5000 word essay. A unit in Philosophy can also consist of a thesis and a unit in Mathematics can also consist of or include a Dissertation or Extended Essay.

Official specification of the structure of each degree course in Oxford University is set out in the University's *Examination Regulations*, familiarly known as "The Grey Book", published annually at the start of each academic year (and including in its title the year of its publication, i.e. the edition that governs the academic year 2007-2008 is entitled *Examination Regulations 2007*). The Grey Book also stipulates the content (syllabuses) of Philosophy subjects for examination.

Examination syllabuses stipulating the content of Mathematics subjects for examination in Honour Moderations in Mathematics and Philosophy and Part A Honour School of Mathematics and Philosophy are published in Supplements to the *Mathematics Course Handbook*; synopses of the lecture courses are also published in therin. For Parts B and C synopses of accompanying lectures for Mathematics subjects are also published in Supplements to the *Mathematics Course Handbook* but formal examination syllabi are generally not stipulated. Syllabuses for Philosophy subjects are stipulated in the *Examination Regulations* (Grey Book). The Philosophy Centre publishes a Philosophy Lectures Prospectus each term for all Philosophy lectures being given in that term.

The information about the Mathematics and Philosophy course given in this Handbook supplements rather than supplants the *Examination Regulations* (Grey Book), which you

should consult in conjunction with the Handbook. This Handbook provides explanations of the regulations in the Grey Book, but the Grey Book is always definitive.

(α) Honour Moderations

Honour Moderations in Mathematics and Philosophy, taken at the end of the first year, consists of four papers, each examined in a three-hour written examination. These are Pure Mathematics I, covering mainly Algebra, Pure Mathematics II, covering mainly Analysis, Elements of Deductive Logic, and Introduction to Philosophy, covering key topics in epistemology and metaphysics and Gottlob Frege's *Foundations of Arithmetic*. All subjects in MP Mods are compulsory.

There is also a Preliminary Examination in Mathematics and Philosophy set in September for candidates (there rarely are any) who have taken Honour Mods and not passed in both Mathematics and Philosophy, or been prevented by illness or other good cause from taking Mods (permission to take Prelims without having taken Mods requires consent of the Proctors). The same four subjects are examined in MP Prelims as for Honour Mods in MP but they are examined in two papers rather than four, one in Mathematics and one in Philosophy. Candidates in MP Prelims only take the paper in one subject if they have already passed the other subject in a previous examination.

Every undergraduate (other than those who already have a degree from another university and been granted Senior Status) must pass a First Public Examination before entering for a Final Honour School. Your college may require you to pass a First Public Examination before your fourth term from matriculating as a condition of continuing with your course.

(β) Final Honour School

In Part A, at the end of your second year, you will be examined on Mathematics subjects studied during the second year of the course. The examination consists of three two and a quarter hour papers which have the same weight in total as two three-hour papers. The subjects are Algebra, Analysis, and options in Pure Mathematics in Part A of the Honour School of Mathematics. Although study of Philosophy continues during the second year of the course, no Philosophy subjects are examined in Part A. There is no minimum standard in Part A required for Mathematics and Philosophy candidates in order to go on to Part B. To proceed to Part C a candidate must achieve Honours standard in Part A and Part B together.

In Part B, at the end of your third year, you will be examined on a total of six subjects or units. These must include at least two and not more than three Mathematics units, of which one must be B1 Foundations, and at least three and not more than four Philosophy subjects, of which two must be Knowledge and Reality (102) and Philosophy of Mathematics (122). Some of these subjects will have been studied in the second year alongside the Mathematics of Part A, the remainder in the third year. Each subject in Philosophy is examined in a three-hour paper. Assessment of some units and half units in Mathematics will be by an extended essay or project, but most units will be assessed by three-hour written examination papers.

In Part C, at the end of your fourth year, you will be examined in a total of three M-level units chosen in any combination from the lists for Mathematics and for Philosophy, subject to the constraint that no unit or half unit in Mathematics, and no subject in Philosophy, may be offered in both Part B and Part C. Units in Mathematics are taken from the schedule of units and half units for Part C (see Supplement to the Mathematics Handbook for Part C or on the web at http://www.maths.ox.ac.uk/current-students/undergraduates/handbooks-synopses/maths.shtml). Units in Philosophy consist of subjects 101, 103-118, 120 as specified in the Regulations for Philosophy in all Honour Schools including Philosophy, or the Rise of Modern Logic as specified in the Regulations for the Degree of Bachelor of Philosophy (*Examination Regulations* p. 515-518) or an M-level thesis of up to 20,000 words.

Most units and half units in Mathematics will be assessed through written examination papers of three hours for a unit and 1 1/2 hours for a half-unit, though some may be assessed through mini-projects, coursework, extended essays or dissertations. Each subject in Philosophy is examined by submitting an essay of at most 5000 words and sitting one three-hour paper.

(c) Choosing Options

(α) General comments on choosing options

In general, when choosing options, go for what interests you, provided that your tutors think you are suited to it, but it's also a good idea to pay attention to the effect your present choice may have on future choices. For example, to offer Functional Analysis in Part C you are recommended to have studied B4 Analysis in Part B, and for B4 Analysis, Topology and Integration from Part A are desirable. History of Philosophy from Descartes to Kant (101) is normally prerequisite to Philosophy of Kant (112). In the case of Philosophy options it's also worth bearing in mind is that in Part C a Philosophy subject is studied at greater depth than in Part B, by writing an essay of up to 5000 words in addition to preparing for a three-hour exam paper, so that for two Philosophy subjects one of which you will study in Part B and the other in Part C and neither prerequisite to the other, it will be sensible to leave the one that interests you more deeply to Part C.

The official syllabuses for all Philosophy subjects are published in the Grey Book. For Mathematics official syllabuses are to found in the Supplements to the *Mathematics Course Handbook* (for Part A there is a Supplement specifically for the Honour School of Mathematics and Philosophy). Official syllabuses form the framework within which exam questions on a paper must be set. But to help your choices informal descriptions of the subjects, followed in some cases by suggested introductory reading, have been set out in the *Mathematics Course Handbook* for mathematics and logic courses and in appendix A of this Handbook for philosophy courses. For discussion about choosing whether or not to do a Philosophy thesis or a Mathematics dissertation see below.

(β) Choosing Options for Parts A, B and C

The specification of Mathematics courses to be examined in Part A together with syllabuses and synopses of supporting lecture courses is distributed to all Mathematics and Philosophy students at the end of their first year. As well as the compulsory core courses in Algebra and Analysis, candidates are expected to prepare 1½-2 units chosen from the Pure Mathematics Options for Part A of the Honour School of Mathematics. Provided they have the support of their college tutors, candidates may also apply for approval to offer for examination other options from Part A of Mathematics.

The Mathematics subjects in Parts B and C are published as supplements to the *Mathematics Course Handbook* no later than the beginning of the Michaelmas Term in the academic year of the examination.

The Philosophy subjects for both Parts B and C are taken from among those specified in the "Regulations for Philosophy in all Honour Schools including Philosophy" (*Examination Regulations 2003*, pp. 423 ff), with the addition of Rise of Modern Logic in Part C and also the option of writing an M-level thesis.

In Part B candidates are required to offer a total of six subjects and units counted together which must include at least two units in Mathematics (of those units specified as 'Mathematics Department Units') and at least three subjects in Philosophy. The Mathematics units must include B1 Foundations. The Philosophy subjects must include 102 Knowledge and Reality, and 122 Philosophy of Mathematics. Because B1 Foundations provides important background for 122 Philosophy of Mathematics, it is recommended that MP students should study B1 in their second year. For Part B Philosophy the required additional subject (which with subjects 102 and 122 constitutes the minimum of three Philosophy subjects in Part B), and the optional further Philosophy subject (i.e. up to a maximum of four, if the minimum of two Mathematics units is chosen), are to be taken from among subjects 101, 103-118, 120, and 199 Philosophy Thesis (for which the word limit is 15,000 words). (Subject 119 Formal Logic, which overlaps with B1 Foundations and the Part C course on Gödel Incompleteness Theorems, is not available in MP; 121 Advanced Philosophy of Physics, which requires substantial background in Physics, is available only in the four-year

Honour Schools of Physics, and Physics and Philosophy; the subjects numbered in the 130s, which require study of texts in ancient Greek, are available only in Greats.)

Part C Mathematics includes one and a half units in Mathematical Logic (Model Theory, Axiomatic Set Theory, and Gödel's Incompleteness Theorems).

Part C Philosophy units may be chosen from the subjects 101, 103-18, 120 as specified in the Regulations for Philosophy in all Honour Schools including Philosophy, plus The Rise of Modern Logic as specified in the Regulations for the Degree of Bachelor of Philosophy (see Appendix A for informal descriptions for these subjects) and an M-level Philosophy Thesis (for which the word limit is 20,000 words). Each specified subject unit is examined in one three hour paper together with a 5000 word essay.

The prescribed topics for M-level essays for each permitted Philosophy subject consists of the questions set for that subject in the examinations for Honour Schools with Philosophy in 2006, with the exception that question 13 on the paper for Plato: Republic (115) and question 13 on the paper for Aristotle Nicomachean Ethics (116) (which are passages for comment from the set text and so not suitable as an essay topic). Past exam papers can be downloaded from http://www.oxam.ox.ac.uk . You may apply for approval of essay topics not prescribed by writing to the Chairman of the Philosophy Faculty Board, c/o the Administrator, Philosophy Centre, 10 Merton Street, giving the title you propose, together with an explanation of the subject and enclosing a letter form your tutor attesting to the suitability of this topic for you. Any such application must be received no later than Friday of the sixth week of the Hilary Term preceding the Part C examination for which the essay is to be submitted. Any such application shall be accepted or rejected by the Board within two weeks of its being received.

(d) Tutors

Anybody to whom you go for tutorials or college classes counts as one of your tutors. For the Mathematics and Philosophy course you are bound to have at least two of them, and there are likely to be several more over the years. Some will be tutorial fellows or lecturers of your own college; some may be tutorial fellows or lecturers of other colleges, or research fellows, or graduate students. The overall responsibility for giving or arranging your tuition will lie with tutorial fellows or lecturers of your own college, probably one in each of Mathematics and Philosophy. Behind them stands the Senior Tutor, who must see that proper arrangements are made if one of these people is absent through illness or on leave.

It will probably be a rule of your college that you call on these in-college tutors at the beginning of term to arrange tuition, and at the end of term to arrange vacation study and next term's subject. In any case it is a very good idea to pay such calls, if necessary on your own initiative. Colleges have different rules about when term begins. The official start is Sunday of First Week of Full Term, but you will certainly be expected to be in residence before then, and you should try to ensure that by the Sunday you know who your tutors for the term will be, have met or corresponded with them, and have been set work and assigned tutorial times by them.

If you would like to receive tuition from a particular person in Oxford, ask the in-college tutor concerned; do not approach the person yourself, who cannot take you on without a request from your college. If you feel strongly that you are not getting on with one of your tutors, and that a change of tutor would be helpful, then say so to the tutor concerned, if that is not too embarrassing. Otherwise don't just do nothing, but take the problem to someone else in your college, e.g. another of your tutors, your College Adviser, the Senior Tutor, the Women's Adviser, the Chaplain, or even the Head of College, if your difficulty is serious. Most such problems arise from a personality-clash that has proved intractable; but since in a university of Oxford's size there are almost certain to be alternative tutors for all your subjects, there is no need to put up with a relationship which is impeding your academic progress. In these circumstances you can usually expect a change, but not necessarily to the particular tutor whom you would prefer.

(e) Tutorials, Classes and Collections

What you are expected to bring to a Philosophy tutorial is knowledge of the readings which was set for it (or a variant on your own initiative if some items prove really inaccessible)and almost always also an essay in which you address some aspect of the topic covered the readings. For Mathematics tutorials you will have been set a problem sheet and should bring (or send to your tutor in advance, if that is the agreed procedure) your solutions to those problems. What you have a right to expect is your tutor's attention (shared with one or sometimes two or more other tutees if the tutorial is for a pair or small group) and guidance throughout the hour agreed. Styles differ, depending on how many students are sharing the tutorial, the nature of the topic, and above all the habits and personality of your tutor. You must not expect uniformity, and you will gain most if you adapt to differences.

For MP Mods it is necessary to prepare four papers in your first year, and for MP Finals it is necessary to prepare eight papers in your second and third years, and three papers in Philosophy or in Mathematics or the equivalent in your fourth year. So you will normally have more than one tutorial a week, often two a week, and you can expect to be set written work for every tutorial. Some of it, especially in philosophy, will be tutorial essays. You will quickly learn what is expected, though it may take many terms' practice to perfect your technique of getting a philosophical argument across.

A typical pattern of Philosophy tutorials for MP Mods is:

	Mathematics	**Philosophy**
MT	8	8 (Logic/General Philosophy)
HT	8	8 (General Philosophy/Logic)
TT	8	8 (Frege, and revision)

This pattern may vary from college to college and particular where class teaching is used rather than tutorials.

For the most part you will find that you are sharing tuition in Mathematics with those who are reading straight mathematics, and tuition in Philosophy with those who are reading some other subject that involves philosophy (e.g. PPE). (There are a few subjects that are special to this joint school, principally in the philosophy of mathematics, but usually you are not on your own. It is, however, desirable that your tutorials in Logic in Michaelmas Term (of your first year) are conducted at a more mathematically sophisticated level than would be the case if you were paired with a student from another joint School. There is a list of tutors willing to give such tutorials, possibly pairing you with an MP student from another college, and your own college tutor should be aware of this.) Get to know those who are reading the same subjects as you, and talk to them about your work (as well as other things). Undergraduates learn a great deal from one another.

Work on a tutorial essay in philosophy involves library searches, reading, thinking, and writing. It should occupy a minimum of three days. Read attentively and thoughtfully, skipping bits that obviously do not bear on your topic: one hour of that is worth many hours of 'summarising' paragraph by paragraph with the music on. As your reading progresses, think up a structure for your essay (but do not write an elaborate plan which you won't have time to execute). Expect to have to worry out your thoughts, both during and after reading. Use essays to develop an argument, not as places to store information. You may assume that your tutor knows what is in the reading set, and is not interested in a simple re-hash of that. But he or she will be interested in your critical appraisal of what you have read, and any arguments of your own that bear upon the topic. At the same time, it is important that the relation of what you say in your essay to what you have read can be made explicit if discussion in tutorial turns on it, and for this reason, it is important to include page references to your readings for points you criticise or make use of.

You will learn a lot if you share and discuss ideas with your fellow students, and if you chance your arm in tutorials. Be enterprising, and be prepared to be wrong, for that is how one learns. (Remember that Oxford's system is not one of continuous assessment; it is what you can do at the end that matters, and not the various mistakes that you will inevitably make on the way.) And bear in mind that tutorials are not designed as a substitute for lectures, or for accumulating information, but to develop the capacity to think on the spot and to articulate your thinking clearly in responding to issues raised about ideas in the essay you or a tutorial partner are presenting. This means that note-taking, if it occurs in a tutorial at all, should be incidental to the dialogue.

Producing essays for philosophy tutorials gives excellent training in writing, and particularly in writing to a deadline. You will need to equip yourself with a writer's tools, most crucially a dictionary, such as the *Concise Oxford Dictionary* or the on-line *Oxford English Dictionary* (accessible on the Oxford University web site), also a thesaurus, and a grammar such as Fowler's *Modern English Usage*.

Tutorials in mathematics will vary from college to college and subject to subject. You are likely to have between one and three other students with you. You will be set some work to do for each tutorial, and in the tutorial you will discuss this work and will probably have an opportunity to ask about any difficulties you may have. In order to get the best out of a tutorial it is very important that you are well prepared. You should have done the work and handed it in if this is expected (even if you have not been able to solve every problem). It is also a good idea to make a note of anything you want to ask about. Be sure to arrive on time.

For Mathematics Parts B and C most students attend inter-collegiate classes rather than tutorials. Classes consist of between five and ten (or occasionally up to 12) students from a number of different colleges and are run by a tutor and a teaching assistant. For Part B there are generally 4 one-and-a-half hour classes for each 16 lecture course, and for Part C there are generally seven one-hour classes for each 16 hour lecture course. There may, however, be some variation in this, particularly for courses involving a practical component. Students are given problem sheets and work has to be submitted to the Teaching Assistant by a specific time. The problems are then discussed in the class. You will receive information about the organisation of these classes from your college tutor, but generally the arrangements are announced at the first lecture of each course.

You will be asked to give feedback on tutorial teaching to your college, and on class teaching to the faculty that has provided it. The various colleges and the two faculties differ in the exact questions asked to elicit your assessment of tutorials or classes, but in general they will ask your views on the amount and quality of teaching, reading materials, timeliness of comments on essays and tutorial performance, and feedback on your progress on the course. Colleges also arrange for you to hear or read reports written by your tutors and to make comments on them, and also for you to submit your own self-assessment of your progress to date and your academic goals.

Most colleges will require you to sit college examinations, called 'collections', before the start of each term. The objects are to test your comprehension of work already covered, and to give you practice in writing timed papers. Make sure at the end of each term that you know the times and subjects of next term's collections.

(f) Lectures

Lecture lists for Mathematics and for Philosophy are published each term. Get copies of both lists from your main subject tutors when you meet before the beginning of term and take the copies to meetings with any other tutors you have for that term, so that each tutor can advise you on which lectures to attend. A brief description of the usual lecture programme is set out below. Each subject specified for examination in the *Examination Regulations* or by the Mathematics Teaching Committee has lectures which cover the syllabus specified for that subject. Up to date information about lectures is available at the two websites whose addresses appear on the front of this handbook.

Lectures form the backbone of mathematics teaching. All lectures for Mathematics

Moderations and Part A are supported by problem sheets compiled by the lecturers. These are available on the web. Many college tutors use these problems for their tutorials and classes; others prefer to make up their own problem sheets. Other lecturers may also provide problem sheets for their lectures. Although these might not be used formally by your college tutor, they are a useful source of suitable problems for practice. In Parts B and C, they will be used for the inter-collegiate classes run in conjunction with the lectures.

Lectures are vital for some Philosophy subjects, less so for others, and depending also on individual differences; get advice from your tutors and fellow students. Learn to take notes at lectures; they will be useful to you later, when you can fit them into a wider picture. Although in Oxford's system lecturers do not necessarily set or mark the University examinations, they are consulted by those who do, and the lecture prospectuses inform examiners as well as students about the content of lectures.

The feedback which you provide to lecturers and tutors is valued and is taken seriously. It has an important contribution to make to maintaining the quality of the education you receive at Oxford. Lecture questionnaire forms will be provided for you to comment on each set of lectures. They will be handed out by the lecturer towards the middle or end of his or her set of lectures, and further copies will be available from department or faculty offices. Completed forms may either be left for the lecturer at the end of the lecture or sent to the departmental office. The results of the questionnaire are seen by the lecturer and also by the Director of Undergraduate Studies or Lectures Committee. The DUS and/or Lectures Committee are responsible for ensuring that any problems reported through the questionnaires are addressed. Those of each subject are reported to the Mathematics Department or Philosophy Faculty and to their joint consultative committees with undergraduates.

(g) Programme of Lectures

First Public Examination (Honour Moderations)

(a) Mathematics

Lectures for the two mathematics papers will be given as follows:

Section 1: Pure Mathematics I

Introduction to Pure Mathematics	5 lectures MT
Linear Algebra I	14 lectures MT
Geometry I	7 lectures MT
Linear Algebra II	8 lectures HT
Introduction to Groups, rings and fields	8 lectures HT
Introduction to Groups, rings and fields	8 lectures TT

Section 2: Pure Mathematics II

Analysis I: Sequences and Series	14 lectures MT
Analysis II: Continuity and Differentiability	16 lectures HT
Analysis III: Integration	8 lectures TT
Geometry II	8 lectures TT

The joint committee for Mathematics and Philosophy recommends that first-year candidates in Mathematics and Philosophy also attend the sixteen lectures in Michaelmas Term on Calculus of One Variable and of Two or More Variables. These lectures cover elementary methods and results widely used in mathematics and are specifically designed to help in the transition from school to university mathematics. Though they appear on the lecture list as background to Applied Mathematics I and II for Honour Moderations in Mathematics, grasp of the material they cover deepens understanding of differentiation and integration, a key part of Pure Mathematics II, and provides useful background for later courses in mathematics.

The first-year computer-based course 'Exploring Mathematics with Maple', which is

compulsory for candidates for Mathematics Mods, does not form part of MP Mods. Due to restricted numbers we regret that this is no longer open to M&P students.

The syllabus and lecture synopses for Mathematics in MP Mods together with suggested reading is in Part V-1 of the *Mathematics Course Handbook*, and on the web at http://www.maths.ox.ac.uk/current-students/undergraduates/handbooks-synopses/maths.shtml, click on Moderations for examination in 2008 using HTML, or PDF format.

(b) Philosophy

Section 3: Elements of Deductive Logic

The lectures for this paper are:

Introduction to Logic	8 lectures MT
Elements of Deductive Logic	8 lectures HT

The *Introduction to Logic* lectures in Michaelmas Term are designed for all those who are starting logic in all schools involving philosophy, whereas the *Elements of Deductive Logic* lectures are designed specifically for Moderations in Mathematics and Philosophy and in Physics and Philosophy, where the examination includes questions of a more mathematical nature. Problem sheets will be handed out weekly in conjunction with the Hilary Term lectures. The Philosophy Faculty hopes to be able to offer classes in conjunction with the Hilary Term lectures in which solutions to problems set by the lecturer will be gone over and discussed.

Section 4: Introduction to Philosophy

The paper consists of two parts: a) General Philosophy: a topic-based introduction to key issues in epistemology and metaphysics; and b) Frege: studied in conjunction with Frege; *Foundations of Arithmetic*. The lectures for this paper are:

General Philosophy	8 lectures in MT and 8 lectures in HT
Frege: *Foundations of Arithmetic*	8 lectures in TT

All candidates in Mathematics and Philosophy must answer at least one question on General Philosophy and at least one question on Frege and four questions in total. The General Philosophy part of the examination is as in other First Public Examinations with Philosophy, and is taught in college tutorials for first-years in all the various courses with Philosophy. The lectures on Frege's *Foundation of Arithmetic* in Trinity Term are specifically for candidates taking this paper. In conjunction with attending these lectures first-years should have six tutorials on Frege in Trinity

Second Public Examination

The scheme of lectures for each year is announced in the Lecture List for Michaelmas Term of that year, which is available in draft at the end of the previous Trinity Term.

Part A

The preparation for the three 2 ¼ hour Mathematics papers will be by means of lectures and college-based tutorials and classes. Each of the two core subjects, Algebra and Analysis, is covered by a 24 lecture course in Michaelmas Term. Students may expect to have an average of about one and a half tutorials per week in Michaelmas Term plus later revision in Trinity Term.

The two core courses constitute two thirds of the mathematics studied for Finals Part A. Options take up the remaining third. Lectures for these are given in Hilary Term (for most options) or the first four weeks of Trinity Term (for a few options). Students are expected to prepare 1½-2 units where a unit is a subject covered in 16 lectures and (correspondingly) a half-unit is a subject covered in 8 lectures. Mathematics and Philosophy candidates in their

second year will choose and prepare for examination in Part A Mathematics options covered by between 24 and 32 lectures in Hilary and/or the first half of Trinity Term. The units may be chosen freely from the list of options in the Supplement to the Mathematics Course Handbook for Part A of the Honour School of Mathematics and Philosophy, i.e. Groups in Action (half unit in HT), Introduction to Fields (half unit in HT), Number Theory (half unit in TT), Integration (full unit in HT), Topology (full unit in HT), and Multivariable Calculus (half unit in TT).

Candidates may also, if they have the support of their Mathematics tutor, apply to the Joint Committee for Mathematics and Philosophy for approval of other options: Calculus of Variations (half unit HT), Classical Mechanics (half unit HT), Electromagnetism (half unit in TT), Fluid Dynamics and Waves (full unit in HT), Probability (full unit in HT), Statistics (full unit in HT), Numerical Analysis (full unit in HT), details of which are to be found in the Supplement to the Undergraduate Handbook for Part A of the Honour School of Mathematics. Such an application must be made through the candidate's college and sent to the **Chairman, Joint Committee for Mathematics & Philosophy, c/o Academic Administrator, Mathematical Institute to arrive by 5 p.m. on Friday of Week 3 of Michaelmas Term.** Be sure to consult your College tutors if you are considering asking for approval to offer one of these additional options,. Given that each of these additional options, which are all in applied mathematics, presume facility with some or other results and techniques covered in Maths Mods or the core syllabus of Maths Part A not taken by Mathematics and Philosophy candidates, such applications will be exceptional.

Mathematics in Part B

In Part B each candidate must offer a total of at least two units and at most three units in Mathematics from the schedule of 'Mathematics Department Units'for Part B for the Honour School of Mathematics, of which one must be B1 Foundations. In addition, candidates may offer O1 History of Mathematics from the list of 'Other Mathematical Units'.

Details of all these units are published in the Mathematics Part B Synopses. The details for Part B examination in 2007 will be published before the beginning of Michaelmas Term 2006, with the exception of B1 Foundations, which is already approved, and is compulsory for Maths and Phil candidates.

Candidates in the Final Honour Schools of Mathematics and of Mathematics and Philosophy will study subjects from this list in their third year, except that the joint committee for Mathematics and Philosophy recommends that candidates in Mathematics and Philosophy study B1 Foundations during their second year since this subject provides important background to the study of Philosophy of Mathematics (122), compulsory in Part B. (B1 Foundations and subject 122 Philosophy of Mathematics bridge the two sides of the school.)

Maths and Philosophy candidates who study B1 in the second year will have covered the equivalent of three Mathematics papers in the second year (of which one is a bridge subject). Two will have been examined (in three 2 ¼ hour papers) at the end of that year and one will be examined in Part B at the end of the following year. They should also study two Philosophy papers in the second year, for examination in Part B the following year. This allocation is calculated on the basis of half a term's work for primary study of a subject to be examined in a three-hour examination plus a quarter of a term's work for revision of that subject. Straight Maths candidates in their second year are following this weighting with four three-hour exams at the end of the second year for which Michaelmas and Hilary Terms have been devoted to primary study (2 = 4 x ½) and Trinity Term devoted to revision (1 = 4 x ¼) (in the case of a few options lectured on in Trinity Term, primary study and revision may be swapped between Hilary and Trinity Terms but the weightings are the same). Maths and Philosophy candidates are studying Mathematics for the equivalent of two three-hour exams at the end of the second year, for which, on the given weighting, study and revision comes to 1 ½ terms, plus one Mathematics subject to be examined in three hours at the end of the third year, for which primary study comes to ½ term, leaving 1 term = 2 x ½ of the second year for primary study of two Philosophy subjects.

Why should this study be allocated within each term of the second year? Since Maths and Philosophy candidates are covering 2/3 of the compulsory core in Maths Part A which is taught entirely in Michaelmas Term and take 1/3 the weight of options taught in Hilary (or the first half of Trinity) it is not possible to arrive at an entirely even allocation (which would be two papers per term, with revision work on a paper counting as half a paper). Ignoring the small number of Part A Maths options lectured on in Trinity Term, the allocation to Mathematics in each term is as follows: MT Part A Algebra and Analysis 2/3 x 2 papers = 1 1/3 papers, B1 Set Theory = ½ paper, for a total of 1 5/6 papers on the Maths side, HT Part A Maths 1/3 x 2 papers = 2/3 papers, B1 Logic = ½ paper, for a total of 1 1/6 papers, TT: Maths revision = 2 x 1/2 = 1 paper's worth of work. Clearly one Philosophy subject should be taught in eight tutorials (or tutorials plus classes) throughout Trinity Term, making the weight of work in Trinity Term the equivalent of study for two papers. If the other Philosophy subject studied in the second year is taught in its entirely in Hilary Term the weight of study in that term is 2 1/6 papers, while the weight in Michaelmas term is 1 5/6. This gives a relatively even distribution of work across MT and HT but has the drawback that no Philosophy is being studied in Michaelmas Term of the second year. This drawback can be alleviated by doing half the Philosophy subject in MT (either four tutorials, or a class) and half in HT (four tutorials). On this scheme 2 1/3 papers are being studied in MT and 1 2/3 papers are being studied in HT, which gives a slightly greater imbalance between the weight of work in the two terms but has the virtue that Philosophy is being studied in all three terms.

On this scheme the Philosophy subject to be studied first in Finals is Knowledge and Reality, one of the two subjects compulsory in Part B, with the other compulsory subject, Philosophy of Mathematics, postponed to benefit from prior study of B1. The second Philosophy subject, to be studied in Trinity Term, could be Philosophy of Mathematics, since by Trinity Term, on this scheme, both parts of B1 will have been studied, and core lectures on Philosophy of Mathematics can have been attended in MT of the second year. However, the joint committee cannot advise everyone to study Philosophy of Mathematics in tutorials in Trinity Term. This is because first-years *must* have their tutorials on Frege's Foundations of Arithmetic in Trinity Term, and it is the same tutors who teach these two subjects. With teaching resources in this area already stretched, it is not possible for a high percentage of second years to have tutorials on Philosophy of Mathematics in Trinity Term. Colleges that have a tutor or college lecturer who teaches Philosophy of Mathematics may be in a position to provide these tutorials in Trinity Term, but colleges that need to find Phil of Maths teaching outside college are advised not to assume that they will be able to find tutorial teaching for Philosophy of Mathematics in Trinity Term. Accordingly, the usual term in which to have tutorials in Philosophy of Mathematics in MT of the third year, during which term candidates should also be attending the core lectures in Phil of Maths.

It should be borne in mind that these are only suggestions on how to cover the syllabus for Part B, and candidates and their tutors should pursue whatever arrangement works best for their individual situation.

Philosophy in Part B

The preparation for the Philosophy subjects is covered by lectures throughout the year. Students may expect to cover the material of each subject in eight tutorials, perhaps with later revision, or by a combination of seven faculty classes and four tutorials. As a general rule, on the more central and popular subjects (which include *History of Philosophy from Descartes to Kant* and *Knowledge and Reality*) there will always be at least 16 lectures, and often twice that number, so that undergraduates may choose according to their own interests; on the less central and less popular subjects there will always be at least 8 lectures and often 16. You cannot guarantee that Philosophy tutorials can always be arranged to coincide with lectures in the same subject, and you must be prepared to attend lectures in advance of tutorials or the other way round.

(h) Vacations

Oxford University's official terms occupy less than half the year, and to master their courses students need to study during vacations as well as throughout each term. At the same time it is recognized that students need to use some of their vacation time for breaks from study, and also, for very many students, to earn money to support themselves during their course.

Undergraduates in Oxford are said to 'read' for a degree, and Mathematics and Philosophy has a strong reading component, especially on the Philosophy side. During term you will mostly move quickly from one article or chapter to another, picking out just what you need for your impending tutorial essay. Vacations are the time for more reflective attention to complete books and, in mathematics, for consolidating your new skills by working through key ideas and techniques on your own.

(i) Changing Course

In any degree course some who embark upon it may come to feel it is not the right course for them. Maths and Philosophy is no exception, and a few students doing the course change to another (also a few doing some other course change to Maths and Phil). If you are feeling like changing, the first thing is to be patient for a while. You may be finding the course difficult, but all courses that are worth doing are difficult at times, and your tutors are there to help you with difficulties. Seek their advice, and discuss problems too with your contemporaries; you are not in competition with them, and you should get into the habit of helping and being helped. Nevertheless you may continue to feel that the course is not right for you.

If you have already made a substantial start in doing this course, it is likely that your tutors will advise you to stay with it until you have completed your First Public Examination. By proceeding in this way you may be able to change course without losing a year, since you must pass a First Public Examination in some course or other before you can proceed to any Final Honour School and any First Public Examination counts as a qualification for any Final Honour School. (The only undergraduates eligible for exemption from the requirement to pass a First Public Examination before entering for an Honour School are those who have already obtained a degree at another university.)

If you are considering changing to another Oxford course from Maths and Philosophy, the three possibilities are to change to straight mathematics, to some other course involving philosophy, or to an entirely different course. This last is the most radical and feasibility depends on particular interests, background and circumstances. The first two are more generally feasible. To change to straight Mathematics after Mods will involve studying over the summer some of the material examined in the two Applied Mathematics papers of Honour Mods in Maths. Your Maths tutors will advise you what to concentrate on. There is no corresponding change to straight Philosophy since Philosophy is studied at undergraduate level in Oxford only in combination with other subjects (there are six other combinations besides Maths and Philosophy). You will need to look at these other combinations to decide which would be best for you in terms of your interests and background. The Undergraduate Prospectus, and Handbooks for each of the courses, will give you basic information, and you should talk to tutors in your college and to fellow students studying other courses with Philosophy. The most radical (and rare) change is to decide to study at another university, either because the course you realize you want to do isn't offered by Oxford, or because you feel that you will do better somewhere else. Before deciding to pursue such a step be sure to get lots of advice, both from tutors and from family and friends. If in the end it seems a good idea, you should be able to ask your college to support your application for a place at another university.

We very much hope and in the great majority of cases can confidently expect that you will do well in this course and will feel you are getting something valuable from it. At the same time, you should not feel that your original choice is irrevocable if it is not turning out as you had hoped and expected.

If you decide you do want to change, there are three bodies that must approve: the University, your college, and those who are paying for you. The University is unlikely to be a problem. It accepts for any examination all candidates who are suitably qualified and supported by their colleges. However, a few departments, such as Psychology, do have quotas for acceptance on to the courses taught in them. Your college has admitted you to read for a particular undergraduate degree (which consists of the sequence of First Public Examination followed by Final Honour School). You cannot change without its permission, which is liable to be refused if the 'receiving' tutors think you unsuited to their course, or don't have

room. If you wish to explore the possibility of changing, first talk to one of your current tutors or, if that is embarrassing, to your College Adviser or the Senior Tutor or some other college fellow whom you know. Then talk to tutors in the subject you wish to change to. This may lead to the college's permission. If you have financial support for your studies from an award, scholarship, or sponsorship, this is likely to be on the basis of the specific course you are pursuing, in which case permission from your funding body to change will be required if this support is to continue. You will need to ask your Senior Tutor to write to your funding body to certify that you have been given permission to change course.

3. Examinations in Mathematics and Philosophy

(a) General

Each year a board of Moderators is appointed from the members of the Philosophy Faculty and the Mathematics Faculty to examine Honour Moderations in Mathematics and Philosophy and Prelims (if there is one), a board of Examiners is appointed from members of the Mathematics Faculty to examine Part A (which only contains Mathematics papers), and Examiners drawn from the Philosophy Faculty and Mathematics Faculty, plus an External Examiner in each subject, are appointed to examine MP Finals Part B and Part C. The Finals examiners are assisted by a number of assessors, also members of the Philosophy Faculty or Mathematics Faculty, who spread the load and deal with some of the specialised subjects. It is chance whether any of your own tutors examine you. If that happens, the convention is that the tutor does not knowingly take any part in deciding your result; but since candidates are identified by numbers and not names in the examinations, the convention operates pretty much automatically.

It is your personal responsibility to enter for University examinations. Entry is through colleges. The forms are kept in college offices, which may advertise times for applying. The University deadlines are listed each year in *Exam Entry Dates and Provisional Start Dates for Examinations*. If you enter after the due date, or change your options, you must gain the examiners' consent and pay a late fee.

The starting dates of examinations, which generally don't change much in relation to weeks of term from one year to the next are announced each year in *Exam Entry Dates and Provisional Start Dates for Examinations*; your tutors can tell you. MP Mods is usually held in the ninth week of Trinity Term, and MP Finals (Parts B and C) begins with the Philosophy papers in the fifth week of Trinity Term, followed by the mathematics papers in the sixth week of Trinity Term for Part C and the sixth/seventh week for Part B. The examinations for Finals Part A are expected to be held in the ninth week of Trinity Term; it is anticipated that one examination will be held each day. The examiners issue a timetable before each examination which is sent individually to candidates who have entered for that exam and is posted in the Examination Schools, and generally also in college lodges. Usually a term before University examinations the examiners send a Notice to all candidates about the conduct of the examination.

When planning your examination strategy it is important to bear in mind the nature of the examinations. Past exam papers for a given subject are a good guide to the sorts of questions that will be asked (so long as the syllabus has not changed), but the questions are set specially for each exam so that candidates must prepare a reasonably wide range of material to be prepared to answer whatever comes up. In Mathematics the criterion for a correct answer is clear (examiners work hard in setting questions to make this so), though there are almost always a number of different ways to give a correct solution, some more efficient or elegant than others, and there is scope for wide variation in clarity of exposition. In Philosophy there is almost never a "correct" answer, but there are clear criteria as to whether an essay is answering the question asked, and examiners penalize answers which do not specifically address the question set. Reproducing your tutorial essay on the topic of the question rather than answering that particular question will result in a low mark, even if the essay is quite good as an answer to a different question. The examiners in Philosophy are looking for your own ideas and convictions, and you mustn't be shy of presenting them as your own: whether you are conscious of having inherited them from somebody else doesn't

matter. When you have selected a question, work out what it means and decide what you think is the answer to it. Then, putting pen to paper, state the answer and defend it; or, if you think there is no answer, explain why not. Do not present more background to the question than is required for answering that question. Don't write too much: going beyond a concise statement and defence of your answer risks irrelevance. Good examinees emerge from the examination room with most of their knowledge undisplayed. The number of questions that must or may be answered will be specified in each paper and their are penalties for 'short weight', i.e. answers to too few questions.

The possibility of calling candidates for examination orally (viva voce), formerly included in Examination Regulations in Philosophy Honour Schools, has been abolished.

For University examinations you must wear academic dress with 'sub-fusc' clothing. Academic dress is a gown, and a regulation cap or mortar board (must be mortar board for men). Sub-fusc clothing is: for women, a dark skirt or trousers, a white blouse, black tie, black stockings and shoes, and, if desired, a dark coat; for men, a dark suit and socks, black shoes, a white bow tie, and plain white shirt and collar.

There is medical evidence that examinees do better if they have had breakfast.

Please write your examination papers LEGIBLY. If an examiner has to struggle to decipher your writing, the flow of what you are saying is lost and the examiner wastes time when time is at an extreme premium (having to mark well over a hundred scripts in just a few weeks while carrying on with other duties). University regulations authorize examiners to require that illegible scripts be typed, but this is a very cumbersome procedure for all concerned, used only as a last resort. The cost of invigilating the typing of illegible scripts is borne by the candidate. University regulations allow candidates in certain circumstances to write their exams on a typewriter or computer, for which arrangements should be made far in advance. There are regulations governing arrangements for blind candidates and for candidates unable to take papers on certain days for religious reasons. Examiners will announce whether calculators are permitted in any of the examinations, and if so which calculators are permitted. If your native language is not English, you may request to use your own bilingual dictionary during examinations. The request must go to the Proctors through your college.

If you have any problems or complaints connected with University examinations you should not approach the examiners directly but put the matter to your Senior Tutor, who will communicate with the chairman of examiners on your behalf. Students have a statutory right to complain to the Proctors directly on any matter to do with examinations but in such case it is a good idea first to consult your tutors, who can advise you on how the issue may be dealt with.

(b) Dissertations in Mathematics

There are two reasons, both educational, why the dissertation option is offered by the Faculty of Mathematics. The first is that most mathematics graduates have to write reports of one kind or another. The necessary skills—of collecting material, organising it, expounding it clearly and persuasively—are better learned sooner than later. The second reason is that the Faculty recognises that some students may show their abilities better on a sustained piece of exposition than on the problems set in a three-hour examination paper.

In Part B students may write a Mathematics Extended Essay equivalent to one unit or 32 lectures. In Part C students may write a half-unit or a whole-unit Dissertation. If some preparation has been done in the Summer Vacation, it should occupy between a quarter and one-third of his or her working time during Michaelmas Term, the Christmas Vacation and Hilary Term. There is always a risk that a project might not succeed, especially if the original plan had involved some original research. Although this is a rare occurrence, examiners are aware of the possibility. They accept that a well-written account of the work done, with an explanation of why the original aims were not met, can nevertheless be worthy

of high credit.

Students who have ideas about dissertations they wish to present should seek guidance from their tutors. Members of the Projects Committee will also be very happy to help focus a project and find a supervisor. The present chairman is Dr P. Neumann.

Tutors and undergraduates are reminded that, under the regulations, an examination candidate proposing to offer this option must seek approval from the Projects Committee. Proposals must be received by the chairman before the end of **Week 3 of Michaelmas Term.** The committee gives its approval if it estimates that the project is appropriate and viable. There will be presentations of possibilities for projects, with discussion of the issues, in each Trinity Term. Undergraduates (and tutors) who seek guidance are invited to attend these sessions.

A list of suggestions for choice of subject, intended only as guidance, is issued by the Projects Committee of the Department of Mathematics, and is available on the Mathematical Institute website. Further ideas are always welcome and should be sent to the chairman of the committee. Any subject is appropriate as long as it gives the student an opportunity to present his or her own work. It is understood that only in exceptional cases will this include original mathematical research. Often it will be a matter of organising, presenting, or completing material culled (and understood) from advanced textbooks, monographs or journals. There have in the past been projects on philosophy of mathematics, on history of mathematics, on algebra, on number theory, on geometry, on topology, on analysis, on numerical analysis, on mechanics, on finance, on theoretical physics, on mathematics and music, and on other subjects in, or closely related to, mathematics. Students have a very wide choice of topic but those who choose a historical topic or a topic that involves the production of computer-generated data should remember that the dissertation is a mathematical one and will be judged accordingly.

A student who, in consultation with his or her tutor, is unable to come up with names of potential supervisors has quite probably chosen an inappropriate subject. Members of the committee are willing to try to help.

The examiners give credit for qualities such as content, accuracy, organisation, clarity and style. A dissertation should be self-contained except insofar as it cites material from Mods, Part A, Part B, and standard works or journals. Proper credit must be given to sources. It may not be handwritten, and students are advised to consider the benefits of computer-based facilities. These allow steady accumulation of material and effective editing. Moreover, although some word-processing and type-setting systems are very poor for mathematical work (and these are to be avoided), others, such as LaTeX, offer the possibility of very well-presented output.

(c) Theses in Philosophy

Candidates may offer a Philosophy thesis in Part B and/or Part C. A thesis in Part B is subject 199 under Special Regulations for Philosophy in all Honour Schools including Philosophy, *Examination Regulations 2007*, pp.428 - 429. A thesis in Part C is governed by the Special Regulations for the Honour School of Mathematics and Philosophy, *Examination Regulations 2007*, pp. 352-3. The deadline for seeking approval of your proposed topic for a Part B Philosophy Thesis is *Friday of fourth Week of the Michaelmas Term preceding the examination* and for Part C *Friday of third Week of the Michaelmas Term preceding the examination* In both cases the application for approval of topic is submitted to the Chairman of the Philosophy Faculty, c/o the Deputy Administrator at 10 Merton Street, and should consist of your proposed title and an explanation of the subject in about 100 words and a letter of approval from your tutor. But you can seek approval earlier and it's a good idea to do so before you put a lot of work into it. Begin thinking about a thesis topic during Easter Vacation of the preceding year, and have a talk with a tutor during that Trinity Term. If your tutor thinks that the subject is manageable, get some initial suggestions for reading and follow them up. Remember that tutors can only advise: the decision to offer a thesis is your own, and so is the choice of topic. So of course is the work; what makes a thesis worthwhile is that it is your own independent production. Don't worry if the outline of your topic in an

early application for approval is not in the end very closely adhered to: the point of it is to make clear the general subject of the thesis and to show that you have some idea how to go about tackling it. If later you wish to alter the title of your thesis, that should not be a difficulty, but you must apply in the same way for permission to do so. (This is so that the chairman of examiners knows what to expect.)

The regulations state that you may discuss with your tutor the field of study, the sources available, and the method of presentation. Before you start work, go over the plan of the whole thesis very carefully with your tutor. The plan must be yours, but the tutor can help you make sure it is clear, coherent and feasible. Get more advice on reading. But bear in mind that much of your reading will be discovered by yourself; so arrange to be in Oxford, or near a large library, for some weeks of the vacation.

Don't let your topic expand, or your reading range too widely; 20,000 words is the length of two articles, not a book. Your tutor may also read and comment on drafts, subject to the constraint that the amount of assistance the tutor may give is equivalent to the teaching of a normal paper; so tutorial sessions can be used for trying out drafts of parts of the thesis. However, you have to write the finished version on your own; make sure you allow plenty of time; almost certainly, more will be needed than you first expected. You must not exceed the limit of 15,000 for a Part B Philosophy Thesis, 20,000 words for a Part C Philosophy Thesis, excluding bibliography. That will probably, to your surprise, become a problem; but the exercise of pruning is a valuable one, encouraging clarity and precision which you should be aiming for in any case.

Some general advice: (i) explain in your introduction just what you are going to do, and in what follows present the argument, step by step, in as sharp a focus as you can achieve: (ii) it is much better to be candid about difficulties than to sweep them aside or fudge issues, and you should show that you appreciate the force of counter-arguments; (iii) bad grammar and bad spelling diminish clarity and detract from an overall impression of competence.

Your bibliography should list all works to which you refer, plus any others you have used that are relevant to the final version. The style for references can be modelled on any recent philosophy book or periodical. The rules for format and submission are in the *Examination Decrees and Regulations*.

If for any reason you expect to submit your thesis late, consult your Senior Tutor in good time. The Proctors may grant permission (in which case payment of a fine for late-presentation may be assessed). If permission is refused the thesis may be rejected or it may be accepted but penalized by reducing its mark by up to one class.

(d) Marking conventions

Examination scripts, theses, dissertations, and essays, both in Mathematics and in Philosophy, are each ultimately given a University Standardised Mark (USM), a natural number up to 100, which are then used in the process of classifying candidates. These USMs for each paper are reported to colleges and candidates and constitute a 'transcript' of the student's performance in the course. USMs are correlated with classification bands as follows:

Class I	Class II 1	Class II 2	Class III	Pass	Fail
70 or higher	69 - 60	59 - 50	49 - 40	39 - 30	below 30

For **Philosophy** the descriptors for the classes are:

Class I: Work displaying analytical and argumentational power, with good command of the facts and/or arguments relevant to the questions and evidence of ability to organise them with clarity, insight and efficiency. When these qualities are evident throughout, the mark should be 80 or above. Where these qualities are evident throughout and the script displays original thought of near publishable standard, the mark should be 90 or above.

Class II.1: Work displaying analytical power and argumentation of the quality associated with a First, but with less comprehensive and thorough command of evidence. Or work showing considerable thoroughness but less analytical skill or less clarity in organisation.

Class II.2: Competent work with no major defects, but giving an incomplete account of the question, or marred by inaccuracies. Or work which demonstrates lapses in (but does not lack) analytical and argumentational skills.

Class III: Work that is generally weak, with muddled argumentation or little relevance, but containing some evidence of knowledge of facts and analytical skill. This class does qualify for an Honours degree.

Pass: Very poor quality work, showing only slight evidence of having studied.

Fail: Work of such a low standard that it cannot be given a Pass mark.

Relevance: In assessing answers markers are reminded of the high value to be placed on relevance. Work that entirely fails to address the question asked by the examiners, however competent and knowledgeable in itself, can gain no marks.

All Philosophy papers are marked independently by two examiners, and a third examiner in any case where the two examiners cannot resolve a discrepancy between their marks. The standard of work for the various classes is specified in the following terms.

For **Mathematics** the descriptors of the classes are:

Class I: The candidate shows excellent problem-solving skills and excellent knowledge of the material, and is able to use that knowledge in unfamiliar contexts.

Class II.1: The candidate shows good problem-solving skills and good knowledge of much of the material.

Class II.2: The candidate shows adequate basic problem-solving skills and knowledge of much of the material.

Class III: The candidate shows reasonable understanding of at least part of the basic material and some problem solving skills. Threshold level.

Pass: The candidate shows some limited grasp of basic material demonstrated by the equivalent of an average of one meaningful attempt at a question on each unit of study. A stronger performance on some papers may compensate for a weaker performance on others.

Fail: Little evidence of competence in the topics examined; the work is likely to show major misunderstanding and confusion, coupled with inaccurate calculations; the answers to questions attempted are likely to be fragmentary only.

(i) Honour Moderations

The second class is undivided. USMs in the range 50-69 are all II.

Both of the Mathematics papers contain eight questions and candidates may submit answers to five of them. Each question is marked out of 20 marks and is divided into two or three

parts. The marks for each part will be given on the examination paper. Examiners may recalibrate the raw marks to arrive at a USM for each paper. It is USMs rather than raw marks that are reported to candidates through their colleges.

On the two Philosophy papers candidates are required to answer four questions.

(ii) Final Honour School

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Part A

Part A consists of three papers, all in Mathematics, AC1(P), AC2(P), AO3(P) (C stands for Core, O stands for Options), each of which is sat for two hours and fifteen minutes. These papers cover essentially half the material of Part A in the HS of Mathematics, consisting of 2/3 of the Core subjects and roughly 1/3 as many Option subjects as are studied by straight Maths candidates.

Paper AC1(P) consists of six short questions, and candidates are expected to answer all of them. Each question is worth 10 marks.. Questions on AC2(P) and AO3(P) are longer and will be marked out of 25. Papers AC1(P) and AC2(P) will contain, respectively, the questions on the Core subjects Algebra and Analysis from Papers AC1 and AC2 for Mathematics Part A, the two Core subjects that Maths and Phil candidates will have studied in Michaelmas Term of that year. Paper AO3(P) contains long questions on the Option subjects, marked out of 25. There will be one question for each 8 lecture course, and two questions for each 16 lecture course. Candidates in Mathematics and Philosophy will have studied Option subjects covered by 24 or 32 lectures (1½-2 units), which means that you will find three or four questions on subjects you have studied in AO3(P). Candidates should hand in answers to at most 4 questions. Your mark for paper AO3(P) will be based on your best 3 answers.

Mark schemes for questions out of 10 will aim to ensure that the following qualitative criteria hold:

> 9-10 marks: a completely or almost completely correct answer, showing good understanding of the concepts and skill in carrying through arguments and calculations; minor slips or omissions only.
>
> 5-8 marks: a good though not complete answer, showing understanding of the concepts and competence in handling the arguments and calculations.

Mark schemes for questions out of 25 will aim to ensure that the following qualitative criteria hold:

> 20-25 marks: a completely or almost completely correct answer, showing excellent understanding of the concepts and skill in carrying through the arguments and/or calculations; minor slips or omissions only.
>
> 13-19 marks: a good though not complete answer, showing understanding of the concepts and competence in handling the arguments and/or calculations. In this range, an answer might consist of an excellent answer to a substantial part of the question, or a good answer to the whole question which nevertheless shows some flaws in calculation or in understanding or in both.

Examiners will recalibrate raw marks to arrive at University Standardised Marks (USMs), which are what are reported to candidates and colleges. In arriving at this recalibration the examiners will principally take into account the sum of the marks for each question, subject to the rules above on numbers of questions answered, and the performance of the candidates in Part A Mathematics on the corresponding papers. The examiners aim to ensure that all papers and all subjects within a paper are fairly and equally rewarded, but if in any case a paper, or a subject within a paper, appears to have been problematical, then the examiners may take account of this in calculating USMs.

Parts B and C

Mathematics:

Examiners will take into account the relative difficulty of papers when assigning USMs. In order to achieve this, Examiners may use information on candidates' performance on earlier parts of the examination when recalibrating the raw marks. They may also use other statistics to check that the USMs assigned fairly reflect the students' performances on a paper.

Philosophy:

Examination scripts in Parts B and C and Essays in Part C each receive a USM (in the process described above of double and if necessary triple marking). When candidates are classified in Part C the Essay USMs are given a weight of 1/3 that of an examination scripts (so the total weight of three Philosophy subjects in Part C is the same as that of four examination scripts).

(e) Conventions for classifying candidates

There are examinations at the end of each year of the course, and you will be classified at the end of the first year (Honour Moderations), at the end of the third year on the basis of your performance in exams at the end of the second and third years (Parts A and B)—which will be your classification for the degree if you take the B.A. at that point, and at the end of the fourth year for classification for the degree of M.Math.Phil. For the first time in June 2007 all Maths and Phil candidates in Part B, not just those taking the B.A., will be given a classification, and this cohort in 2008 will receive a separate classification for performance in Part C. Candidates taking Part C in June 2007 will receive an honours classification for the degree of M.Math.Phil. on the basis of marks in Parts A + B + C. The conventions used by examiners to determine these classifications are as follows.

(i) Honour Moderations

No candidate is given a classification lower than the average of their USM marks on their four papers, so long as they pass in both subjects. A candidate may be given a class higher than the average of their marks in conformity with the regulation that "The highest honours can be obtained by excellence either in Mathematics or in Philosophy provided that adequate knowledge is shown in the other subject of the examination" (*Examination Regulations 2006*, p. 97, lines 36-8). The convention governing this regulation is the following. For A the average of the four USMs, M the average of the two Mathematics USMs and P the average of the two Philosophy USMs: A candidate who achieves A ≥ 67 and either M ≥ 70 and P ≥ 60, or P ≥70 and M ≥ 60 will be awarded a First.

A candidate who fails Honour Moderations in Mathematics and Philosophy can still pass the First Public Examination by taking the Preliminary Examination in Mathematics and Philosophy in September. To pass the First Publication Examination in Mathematics and Philosophy it is necessary to pass both in Mathematics and in Philosophy and score at least 30 USMs on each individual paper. A candidate who has passed in one of the subjects and failed in the other sits only the Prelims paper for the subject not yet passed.

Alternative form:
Classification for Honour Moderations In Mathematics and Philosophy is based on the following convention. The USMs for Mathematics papers are averaged over papers A and B to obtain the simple average M. The USMs for the Philosophy papers are averaged over Papers 3 and 4 to obtain the simple average P. All 4 papers are averaged to form the overall average A.

To obtain a pass or honours pass a candidate must pass both Mathematics and Philosophy separately, that is, $M \geq 30$ and $P \geq 30$.

Classification follows from the following rules :
1st class : $A \geq 70$ OR $A \geq 67$ and either $M \geq 70$ and $P \geq 60$, or $M \geq 60$ and $P \geq 70$.

2nd class : Not qualifying for first class and $70 > A \geq 50$

3rd class : $50 > A \geq 40$

Pass and not qualifying for Honours : $40 > M \geq 30$ and $40 > P \geq 30$

Fail but pass (Mathematics only) $M \geq 30$ and $P < 30$

Fail but pass (Philosophy only) $M < 30$ and $P \geq 30$.

Fail both : $M < 30$ and $P < 30$.

In addition to this, it should be noted that no student shall be awarded a Pass or Honours unless they score at least 30 on each paper.

(ii) Final Honour School

Parts A and B

There is no requirement of a minimum standard to be achieved in Part A before a candidate can proceed to Part B, but you must achieve honours standard in Part A and Part B taken together to be allowed to proceed to Part C.

For Part B all candidates will receive a classification on the basis of marks in Part A and Part B taken together, and will be given a separate classification for performance in Part C the following year (*Examination Regulations 2007*, p. 350, para. 5).

After USMs have been determined for all scripts, the Examiners will calculate the average USM overall, the average USM for Mathematics papers, and the average USM for Philosophy papers. In calculating the average USM for whole unit Mathematics papers the Part A and Part B marks will be given relative weights of 2 to 3.

M = weighted average of USMs on the Mathematics papers with the following weights:

Part A Mathematics paper 8
Part B Mathematics unit 18
Part B Mathematics half-unit 9.

(Since each Part A Mathematics paper in HS Mathematics and Philosophy is 2/3 of a paper in Part A HS Mathematics, the three papers in MP Part A have the weight of 2 Part A papers in HS Mathematics, and in the above calculation are weighted 24, while two Part B Mathematics papers are weighted 36, giving them the relative weights of 2 to 3.)

P = average of USMs on the Philosophy papers, with equal weights for each paper.

$A = [(8-k)M + kP]/8$ where k is the number of philosophy papers taken.

Then the following conventions will apply, in keeping with the stipulation that for the award of the highest honours it is not necessary to perform with excellence in each of Mathematics and Philosophy separately (Examination Regulations 2005, p. 370):

1. No candidate will be given a classification lower than that implied by the place of the value of A on the scale 70-100 First; 60-69 Upper Second; 50-59 Lower Second; 40-49 Third; 30-39 Pass; 0-29 Fail.

2. In the following circumstances a candidate will be given a higher classification than that implied by the value of A:

    a. A candidate who achieves A >= 67 and either M >= 70 and P >= 60, or P >= 70 and M >= 60 will be awarded a First.

    b. A candidate who is not awarded a First but who achieves A >= 57 and either M >= 60 and P >= 50, or P >= 60 and M >= 50 will be awarded an Upper Second.

3. The award of a Third, Pass or Fail will, in all cases, be by individual consideration.

Part C (This needs to be replaced by convention discussed at June 2007 meeting).

Classification Rules

No candidate shall be given a classification lower than the average of their USMs on all papers. In calculating this average USM the USMs for Mathematics papers in Part A, Part B, and Part C shall be weighted in the ratio 2 to 3 to 4, respectively.

Regulations for the Final Honour School stipulate that "for the award of the highest honours it is not necessary to perform with excellence in each of Mathematics and Philosophy separately". Accordingly, there are situations in which a candidate will be given a classification that is higher than the average of their marks across all papers.

Let M be the weighted average mark of the candidate's Mathematics papers, let P be the average mark of their Philosophy papers. This rule applies in case one of these averages is >=70 and the other is >=60. This candidate will be awarded a First if M+P >= 134.

[Here the `margin' m = (M+P)-(70+60) = 4. For example: Candidates with M = 74 and P = 60, or P = 70 and M = 64, will be awarded a First.]

The same corresponding rule applies at the II(i)/II(ii) borderline, i.e. if one of the subject averages is >= 60 and the other is >= 50 and M + P >= 114.

Cases in which a candidate will not receive a classification higher than their weighted average USM:

A. If the number of papers in the higher subject is the minimum permitted in that subject.

B. If the average mark in Mathematics and in Philosophy is separated by a class.

Award of a Third, a Pass, or a Fail shall be by individual consideration.

The examiners may make a small modification to the value of the margin m, provided that agreement to do so is unanimous and the modification to m is recorded in the Examiners' report.

(f) Prizes

The Henry Wilde Prize, value £500, is awarded for the outstanding performance in philosophy among all of the Final Honour Schools, and the examiners in Part B will nominate a candidate in that examination whose performance in the Philosophy papers in Part B gives them a reasonable chance of winning the prize. The prize is open to all candidates in Part B, whether or not they plan to go on to Part C. A Gibbs Prize in Mathematics, value £100, is available to be awarded to the outstanding candidate in Mathematics in Part B. Gibbs Prizes of £100 are available to be awarded for the outstanding performances in Philosophy and in Mathematics in Part C. The Elizabeth Anscombe Thesis Prize, value £100, is awarded to the best FHS Philosophy thesis across all FHSs involving Philosophy. These prizes are all awarded on the nomination of the examiners in Part B or Part C and no application by students in required. Candidates who have passed Part B are eligible to enter for the John Locke Prize in Mental Philosophy, worth £500, since they satisfy the requirement to have passed all the examinations requisite for the Degree of Bachelor of Arts of the University, provided that they may not take the examination later than the tenth term from that in which they completed the said examinations. This prize is awarded on the basis of two three-hour examinations which are set during Michaelmas Term. Intending candidates must submit an application form, which may be obtained, along with further details of the Prize, from the Administrator of the Philosophy Faculty, 10 Merton Street, early in Michaelmas Term.

(g) Illness

If illness interferes seriously with your academic work, make sure that you explain what is going on to your college tutors and seek help. Help may involve: excusing you from tutorials for a bit; sending you home; asking the University to grant you dispensation from that term's residence (to qualify for the four year degree in Mathematics and Philosophy you must reside and study in Oxford for twelve terms, nine if you have Senior Status, and the three-year degree is nine terms, six with Senior Status--a term for that purpose means forty-two nights); or permitting you to go out of residence for a number of terms, with consequent negotiations with your funding body if you have one.

If illness has interfered with preparation for a University examination, or has affected you during the exam itself, your college will report the fact to the Proctors, who will pass the information to your examiners "if, in their opinion, it is likely to assist the examiners in the performance of their duties." Your college also reports to the Proctors if illness or disability has prevented you from attending part of a University examination, or makes it desirable that you should be examined in a special place or at a special time. The college officer concerned is normally the Senior Tutor. You, therefore, must deal with your Senior Tutor, never with the examiners. Give the Senior Tutor as much notice as possible; in particular, examinations specially invigilated in a special place (usually your college) take a lot of organising. Probably you will need a medical certificate; college doctors have the required University forms.

For more information about health issues while you are at University consult the *Proctors' and Assessor's Memorandum*.

(h) **Penalties for late submission of Mathematics project work**

The formal procedures determining the conduct of examinations are established and enforced by the University Proctors. For the Mathematical Institute such examination conventions are set out in the course handbook and in additional supplements. These conventions are a guide

to the examiners and candidates but the regulations set out in the Examination Regulations have precedence. The examiners are nominated by the Nominating Committee in the Mathematical Institute and those nominations are submitted for approval by the Vice-Chancellor and the Proctors. Formally, examiners are independent of the Department and of those who lecture courses. However, for written papers in Mathematics, examiners are expected to consult with course lecturers in the process of setting questions.

The paragraphs below give an indication of the conventions to which the examiners usually adhere, subject to the guidance of the appointed external examiners, and other bodies such as the Teaching Committee in the Mathematical Institute, the Mathematical, Physical and Life Sciences Division, the EPSC and the Proctors who may offer advice or make recommendations to examiners. It must be stressed that to preserve the independence of the examiners, candidates are not allowed to make contact directly about matters relating to the content or marking of papers. Any communication must be via the Senior Tutor of your college, who will, if he or she deems the matter of importance, contact the Proctors. The Proctors in turn communicate with the Chairman of Examiners.

The Examination Regulations stipulate specific dates for submission of the required pieces of coursework to the Examiners, (OE Other Mathematical Extended Essay, BE Mathematical Extended Essay, N1 Undergraduate Ambassadors coursework, Dissertation for Part C). Rules governing late submission and any consequent penalties are set out in the `Late submission of work' sub-section of the `Regulations for the Conduct of University Examinations' section of the Examination Regulations 2007 on pages 45, & 46.

Under the provisions permitted by the 2007 regulation, late submission of course-work for Mathematics examinations will normally result in the following penalties:

- With permission from the Proctors under clause (1) of para 16.8, page 45, no penalty.
- \item With permission from the Proctors under clause (3) + (4) of para 16.8, a penalty of a reduction in the mark for the coursework in question of at least 5 USMs (or at least 5\% of the maximum mark available for the piece of work); the exact penalty to be set by the Examiners with due consideration to the advice given in the document `Academic Penalties for Late Submission of a thesis or other exercise: Proctors Notes for Guidance', dated 1/11/06.
- \item Where the candidate is not permitted by the Proctors to remain in the examination he or she will be deemed to have failed the examinations as a whole.
- \item Where no work is submitted or it is proffered so late that it would be impractical to accept it for assessment the Proctors may, under their general authority, and after (i) making due enquiries into the circumstances and (ii) consultation with the Chairman of the the Examiners, permit the candidate to remain in the examination. In this case the Examiners will award a mark of zero for the piece of coursework in question.

(i) **University guidelines on Plagiarism**

The University and Department employ a series of sophisticated software applications to detect **plagiarism** in submitted examination work, both in terms of copying and collusion. It regularly monitors on-line essay banks, essay-writing services, and other potential sources of material. It reserves the right to check samples of submitted essays for plagiarism. Although the University strongly encourages the use of electronic resources by students in their academic work, any attempt to draw on third-party material without proper attribution may well attract severe disciplinary sanctions.

Below is the University definition of what constitutes Plagiarism. All cases would be regarded as a serious disciplinary matter and could result in your being suspended or being

sent down.

What is plagiarism?

Plagiarism is the copying or paraphrasing of other people's work or ideas into your own work without full acknowledgement. All published and unpublished material, whether in manuscript, printed or electronic form, is covered under this definition.

Collusion is another form of plagiarism involving the unauthorised collaboration of students (or others) in a piece of work.

Cases of suspected plagiarism in assessed work are investigated under the disciplinary regulations concerning conduct in examinations. Intentional or reckless plagiarism may incur severe penalties, including failure of your degree or expulsion from the university.

Why does plagiarism matter?

It would be wrong to describe plagiarism as only a minor form of cheating, or as merely a matter of academic etiquette. On the contrary, it is important to understand that plagiarism is a breach of academic integrity. It is a principle of intellectual honesty that all members of the academic community should acknowledge their debt to the originators of the ideas, words, and data which form the basis for their own work. Passing off another's work as your own is not only poor scholarship, but also means that you have failed to complete the learning process. Deliberate plagiarism is unethical and can have serious consequences for your future career; it also undermines the standards of your institution and of the degrees it issues.

What forms can plagiarism take?

Verbatim quotation of other people's intellectual work without clear acknowledgement. Quotations must always be identified as such by the use of either quotation marks or indentation, with adequate citation. It must always be apparent to the reader which parts are your own independent work and where you have drawn on someone else's ideas and language.

Paraphrasing the work of others by altering a few words and changing their order, or by closely following the structure of their argument, is plagiarism because you are deriving your words and ideas from their work without giving due acknowledgement. Even if you include a reference to the original author in your own text you are still creating a misleading impression that the paraphrased wording is entirely your own. It is better to write a brief summary of the author's overall argument in your own words than to paraphrase particular sections of his or her writing. This will ensure you have a genuine grasp of the argument and will avoid the difficulty of paraphrasing without plagiarising. You must also properly attribute all material you derive from lectures.

Cutting and pasting from the Internet. Information derived from the Internet must be adequately referenced and included in the bibliography. It is important to evaluate carefully all material found on the Internet, as it is less likely to have been through the same process of scholarly peer review as published sources.

Collusion. This can involve unauthorised collaboration between students, failure to attribute assistance received, or failure to follow precisely regulations on group work projects. It is your responsibility to ensure that you are entirely clear about the extent of collaboration permitted, and which parts of the work must be your own.

Inaccurate citation. It is important to cite correctly, according to the conventions of your discipline. Additionally, you should not include anything in a footnote or bibliography

that you have not actually consulted. If you cannot gain access to a primary source you must make it clear in your citation that your knowledge of the work has been derived from a secondary text (e.g. Bradshaw, D. Title of Book, discussed in Wilson, E., Title of Book (London, 2004), p. 189).

Failure to acknowledge. You must clearly acknowledge all assistance which has contributed to the production of your work, such as advice from fellow students, laboratory technicians, and other external sources. This need not apply to the assistance provided by your tutor or supervisor, nor to ordinary proofreading, but it is necessary to acknowledge other guidance which leads to substantive changes of content or approach.

Professional agencies. You should neither make use of professional agencies in the production of your work nor submit material which has been written for you. It is vital to your intellectual training and development that you should undertake the research process unaided.

Autoplagiarism. You must not submit work for assessment which you have already submitted (partially or in full) to fulfil the requirements of another degree course or examination.

Not just printed text! The necessity to reference applies not only to text, but also to other media, such as computer code, illustrations, graphs etc. It applies equally to published text drawn from books and journals, and to unpublished text, whether from lecture handouts, theses or other students' essays. You must also attribute text or other resources downloaded from web sites.

All matters relating to plagiarism are taken very seriously and
would lead to a Disciplinary matter. See for example, *The Proctors and Assessor booklet Essential Information for Students* Section 9, also available on-line at

http://www.admin.ox.ac.uk/proctors/info/pam/section9.shtml.

4. University Facilities

(a) The Administration

Mathematics and Philosophy is the joint responsibility of the Faculty of Mathematics and the Faculty of Philosophy.

A Standing Joint Committee for Mathematics and Philosophy administers the course and makes regulations for examining it. The members of the committee are the three holders of University posts in Mathematical Logic and Philosophy of Mathematics plus two representatives appointed by the Philosophy Faculty Board and two appointed by the Teaching Committee of the Department of Mathematics. It meets on the Tuesday afternoon of the third week of each term. Correspondence may be addressed to the Chairman, Joint Committee for Mathematics and Philosophy, c/o Academic Administrator, The Mathematical Institute, 24-29 St Giles'.

Linked to each parent body for the joint school is an Undergraduate Joint Consultative

Committee (JCC). Under their constitutions these committees contain about half a dozen Senior Members and undergraduate representatives. The Philosophy JCC contains undergraduate representatives from every college that cares to appoint one; the undergraduates must be reading for some Honour School involving philosophy, but not necessarily MP. The Mathematics JCC contains up to thirteen junior members. Each year, the Joint Committee for Mathematics and Philosophy ensures that an undergraduate reading MP is elected to represent the joint school on both JCCs. The committees meet once a term, and make recommendations to their faculties or to the Standing Joint Committee for Mathematics and Philosophy. The Philosophy JCC appoints two of its undergraduate members to attend Faculty meetings as observers, and its chairman attends meetings of the Undergraduate Studies Committee as a junior member.

Feedback is given to students on the web page :

http://www.maths.ox.ac.uk/current-students/undergraduates/jccu

There is also MURC (Mathematics Undergraduate Representative Committee) which represents the interests of undergraduate mathematicians; it has twice-termly meetings, runs a weekly bookstall and maintains a website. Full details are contained in the *Mathematics Course Handbook*.

The Mathematical Institute

Full details about the Mathematical Institute can be found in the *Mathematics Course Handbook* and at its website.

The Philosophy Centre

The Philosophy Centre at 10 Merton Street is open from 9.30 to 17.25, Monday to Friday (16.25 outside of weeks 0 - 9). *The Centre operates an access control system and you will need your University Card to gain entry.* The administrative offices are generally closed between 13.00 and 14.00. The Centre is sometimes open for evening meetings, or when the Philosophy Library (housed in the same building) has longer hours. The Centre is closed for about ten days at Christmas and Easter, and for five weeks from the beginning of August to early September. As well as the Library, it contains a lecture room, a seminar room, a common room, a garden, and the administrative offices. All enquiries, including the purchasing of study aids (such as 'Logic Exercises'), should be directed to the Secretarial Assistant (Tel: (2)76926) in room G11 (second office on the left of the administrative corridor). A few members of the Philosophy Faculty have offices in this building, though most are based in their colleges. The philosophy web site at http://www.philosophy.ox.ac.uk contains further useful information.

(b) Libraries

(b) Libraries

The library provision in Oxford University is very good but can seem rather complex. Mathematics & Philosophy students will need to use a variety of libraries during their time in Oxford. Your local College library will have a good selection of books which can be borrowed. A more extensive range of books will be available from the relevant University libraries. Brief information about each of these libraries is listed below. Looking at the web page, picking up a paper guide or asking the library staff can provide you with further information about specific services or the rules and regulations of each library.

Admission: The University Card, which is distributed by your College, will be required to enter and/or to borrow books or order items from closed stacks. The best policy is to always carry your University Card with you when you go to a library. (If you lose your University Card, request a replacement as soon as possible from your College Secretary.)

Induction: There are induction sessions for all Mathematics & Philosophy students during 0^{th} week. You will be taught how to use OLIS, the Oxford University library catalogue, and OxLIP, the local interface to a large selection of subject databases and internet resources. These sessions take place in the Philosophy Centre Lecture Room (10 Merton Street). You will receive further instructions from your College about the timing of these sessions. If you miss your induction session, the Philosophy Library offers daily sessions for new members throughout the year.

Finding books: Begin by checking the OLIS catalogue for items listed on your reading lists. Ask library staff for assistance if you cannot find the books you need. Ask the library how to suggest new purchases if the item is not in Oxford.

Finding journal articles: First look for the title of the journal you need in the OLIS catalogue. If you do not know the issue or the page number of the article, ask library staff who can help you search for the item in one of the many subject databases available from OxLIP, e.g. Philosopher's Index. Many journals are now available electronically via OxLIP, for reading or printing. Feel free to ask library staff for further information and assistance!

Borrowing from a library or reading in the library: Once you have found the books or journal articles you wish to read, you may be able to borrow the item from a lending library or you can read the reference copy in a Bodleian Library Reading Room. In addition, your college library will often have lending copies of items on reading lists.

Library	**Main subjects covered**
BOD Philosophy Reading Room	Philosophy
Philosophy Faculty Library	Philosophy
Radcliffe Science Library	Science and Medicine

Library	**Opening hours** **During term, Mon – Fri**	**Saturday**	**Number of seats**	**Number of PCs**	**Printers available?**
BOD Phil RR	9:00 – 19:00	10:00 – 16:00	70	7	YES
Philosophy Faculty Lib	9:30 – 18:30 (Fri: 17:30)	10:00 –13:00	60	12	YES
RSL	9:00 – 22:00	10:00 – 16:00 (and Sun: 11:00-17:00)	150	30	YES

Library	**Number of photocopiers**	**Price**	**Type of card**
BOD Phil RR	2	7 pence	University common card
Philosophy	2	7 pence	University common card
RSL	3	7 pence (A4) 10 pence (A3)	University common card

Library	**Electricity mains for laptops available?**	**Ethernet available for laptops?**	**Location allowed**
BOD Phil RR	YES	NO	Designated desks
Philosophy	YES	YES	CRR and Main Library
RSL	YES	YES	Throughout

Lending Library	**Loan Allowance**	**Loan Period**	**Renewal Allowed ?**	**Number of renewals per book**	**Renewals via OPAC possible?**	**Reservations Allowed?**	**Reservations via OPAC possible?**
Philosophy Faculty Library	12	2 day, 7 day	YES	2	YES	YES	YES
RSL	14	7 day, 14 day	YES	10	YES	YES	YES

Reference Library	**Number of stack**	**Held in library for**	**Reservation for stack**	**Reservation via OLIS OPAC possible?**

	requests allowed	how long?	material allowed?	
BOD Phil RR	10	7 days	YES	YES
RSL Desk	20	7 days	YES	YES

Library	Web address
Bodleian	http://www.bodley.ox.ac.uk/
Philosophy	http://www.bodley.ox.ac.uk/guides/philosophy/
RSL	http://www.ouls.ox.ac.uk/rsl

We hope you will enjoy using Oxford's libraries.

Please respect other library users and take care of library books and facilities.

(c) Copyright Law

The copying of books and journals and the use of self-service photocopiers are subject to the provisions of the Copyright License issued to the University of Oxford by the Copyright Licensing Agency for the copying (from paper on to paper) of:

up to 5% or one complete chapter (whichever is the greater) from a book;
up to 5% or one whole article (whichever is the greater) from a single issue of a journal;

up to 5% or one paper (whichever is the greater) from a set of conference proceedings.

(d) Computing

Many colleges have a computer room, with software for wordprocessing and other applications, connections to the central University machines and the Internet, and printers.

There are fourteen reader workstations situated throughout the Philosophy Library at 10 Merton Street, including three in the new Computing Resources Room, which also has a printer and mains and ethernet points for students who want to use their own laptops in the building. The Library and Centre are open 09.30 - 17.25 (16.25 outside of weeks 0 - 9) Monday to Friday.

The Oxford University Computing Services (OUCS) are at 13 Banbury Road, Oxford OX2 6NN. The building is open to non-keyholders Monday to Friday 08.30 - 22.00. Users must register, either in person, or at telnet register.ox.ac.uk, or at http://info.ox.ac.uk/oucs/register; in each case you will need your University Card with you. Registered undergraduates have access to courses on the use of the central computers and personal computers, to the Learning and Resource Centre (Monday to Friday 09.00 - 22.00), the Help Area (Monday to Friday 10.00 - 16.00), the Micro Centre for advice on the use of computers and help in choosing what to buy (Monday, Wednesday, Friday 14.00 - 16.00), and the Shop (Monday to Friday 09.15 (Tuesday 09.45) - 17.00); also, by application, to e-mail, the Internet, printers and software. Further details may be obtained from the reception desk (Monday to Friday 08.30 - 17.30, tel: 273200) or from the web on http://info.ox.ac.uk/oucs; or questions can be sent by e-mail to enquiries@oucs.ox.ac.uk.

(e) Scholarships, Grants, and Prizes

After your first year you will be eligible for a scholarship or exhibition from your college, on academic criteria which the college decides and applies. The University administers a number of trust scholarships, mostly narrow and none specifically for MP subjects; they are listed in the University's *Statutes, Decrees and Regulations* (the "Blue Book"), which you can consult in your college office or a library.

Grants for special purposes such as research travel, or for hardship, are available from many

colleges to their members. There are also two more general schemes. (1) Access Funds are provided by the state to give financial help to full-time 'home' undergraduates and postgraduates where access to higher or further education might be inhibited by financial considerations, or where students, for whatever reasons, including disabilities, face financial difficulties. Application should be made to your college. (2) The University's Committee on Student Hardship makes grants and loans for the relief of financial hardship, which must have been unforeseeable at the time of admission. It meets once a term, and application forms, which are held in your college office, must be completed and in the hands of a designated college officer, probably the Senior Tutor, before a designated time, probably in Fourth Week of the Michaelmas and Hilary Terms, and First Week of the Trinity Term.

There are a number of University prizes in addition to those for which all examination candidates are automatically eligible for which undergraduates can enter. A list is published each year as a supplement of the *University Gazette*, which can be consulted in most college libraries or the Bodleian or bought from the OUP bookshop at 116 High Street (Tel: 242913).

5. Student Support

(a) Equal Opportunities

The University has in place policies relating to equal opportunities, harassment and disability which are kept under review. Details can be found in the university prospectus, on the Oxford University website (http://www.admin.ox.ac.uk/eop/) and in the *Proctors' and Assessor's Memorandum*, a booklet which is given to all students on arrival.

(b) Harassment

The University has a Code of Practice on Harassment, which is published in the *Proctors' and Assessor's Memorandum*. The Code of Practice makes it a disciplinary offence for any member of the university to harass another on any grounds. There are four confidential advisers who can be contacted for help on any matter related to harassment: for Maths, Professor Paul K. Tod (telephone: (2)73527; e-mail: tod@maths.ox.ac.uk) and Dr J. Dyson (Mansfield College) (telephone: (2)70978; e-mail janet.dyson@mansfield.ox.ac.uk); and for Philosophy, Dr Katherine Morris (telephone: (2)70985; e-mail katherine.morris@mansfield.ox.ac.uk); and Mr Derek Parfit (telephone: (2)79282); e-mail derek.parfit@all-souls.ox.ac.uk).

You will also find that your college has people that you can approach if you feel harassed. You may wish to go to your tutor or to the Senior Tutor; alternately you may wish to deal with someone who is not connected directly with your academic work or your course.

(c) Special Needs

The University operates a code of practice to provide equality of opportunity for those with special needs/disabilities. There are currently over 500 students with disabilities at Oxford and the University and the colleges are committed to making arrangements to enable students with disabilities to participate as fully as possible in student life. The University's Committee for Disabled People is responsible for considering the issues facing disabled staff and students of the University, improving access to University buildings for people with impaired mobility, and providing support to disabled staff and students. Detailed information about provision and sources of assistance, including the University's Disability Statement and the Access Guide for People with Disabilities, which gives details about the accessibility of most University buildings, can be found on the web site at http://www.admin.ox.ac.uk/eop/, or disability@admin.ox.ac.uk or by telephone 01865 (2)80459.) Local information on access and resources can be found on the Philosophy Faculty webs site at http://www.philosophy.ox.ac.uk. Further information and advice are available from the University Disabilities Office, Tel: (2)80459, E-mail: disability@admin.ox.ac.uk. The Disability Co-ordinator for the Philosophy Faculty is Dr Hilla Wait, telephone: (2)76927, e-mail: hilla.wait@philosophy.ox.ac.uk. Observations or complaints concerning disablement issues should be addressed via college and departmental disability contacts – details can be obtained from the Disabilities Office or found on websites..

Please also see the Mathematical Institute Departmental Disability Statement, appended at G in the Mathematics course Handbook.

6. Afterwards

(a) Taking your Degree

Once your name has appeared on the MP Class List or Pass List, you may 'supplicate' for the degree of Bachelor of Arts or of Master of Mathematics and Philosophy, that is, ask to be presented to the Vice-Chancellor or the Vice-Chancellor's deputy, either in person or *in absentia* as you choose. Your college presents you, and you must apply through it. If you wish to be presented in person, you must apply months in advance: there are about a dozen ceremonies each year (usually in the Sheldonian), but they are heavily booked. You may ask your college for up to three tickets entitling guests to attend a degree ceremony, and your college will probably invite you, and possibly your guests, to lunch on the day. Dress is sub-fusc, and you must also make sure that you have, perhaps by loan from your college, an undergraduate gown, mortar board or cap, and also a BA gown and hood. The same procedure applies to the degree of MA, for which you may supplicate, together with or after your BA or your MMathPhil, in or after your twenty-first term from matriculation.

(b) Careers

The summer of your penultimate year is probably a good time to start thinking about what you will do next after Finals.

The Careers Service at 56 Banbury Road, Oxford OX2 6PA (Tel: (2)74646, Fax: (2)74653), is at the disposal of all students, while studying and for four years after they leave Oxford. It is open from 10.00 to 13.00 and 14.00 to 17.00 on Mondays to Fridays, and from 10.00 to 13.00 on Saturdays during Full Term.

If you are thinking of further study, mention it to your tutors by the beginning of your final year at the latest. Most postgraduate applications (to the northern hemisphere) have to be submitted by December or January. Overseas fellowships and scholarships may have closing dates as early as November. The arrangements for research council awards in Mathematics can be found on the Mathematical Institute website at http://www.maths.ox.ac.uk/prospective-students/graduate/. Applications for AHRC Postgraduate Awards must be delivered by 1 May, complete with evidence of at least provisional acceptance for a named course at a named UK university. You must therefore apply to the university concerned early in the New Year, and this includes Oxford, where faculties, not colleges, control graduate admission. You should also collect and complete an application form for an AHRB Award as soon as the forms arrive in your college office, usually during February. If you want to apply to US Universities to do graduate work, you need to be aware that some of them have deadlines in December, and also that they may require applicants to have taken the Graduate Record Exam by then.

The *Oxbridge Careers Handbook* is produced annually by Oxford University Students' Union and gives useful information about careers.

APPENDICES

Appendix A: Informal Descriptions of FHS Philosophy Courses

The following informal descriptions of the subjects for examination in Honour Schools with Philosophy should be read in conjunction with the official stipulation of the examination syllabus of each of these subjects in the *Examination Regulations* 2006, pp. 461 – 469. It is helpful in understanding what a subject encompasses also to look at past exam papers set for that subject (in doing this you may need to check if the past paper you are looking at was set on the present syllabus, and be aware if not how the syllabus in force when that paper was set differs from the current one).

Past exam papers are available on the University's web site from Oxford Examination Papers Online (OXAM) http://www.oxam.ox.ac.uk/main.asp and later this year past Philosophy exam papers may also be readily accessible on the Philosophy web site at http://www.philosophy.ox.ac.uk/past_papers/FHS/.

In what follows, you will find that some subjects are named as 'normal prerequisites' for the study of others. For instance: 112 The Philosophy of Kant (NP 101) means that those studying 112, Kant, would either normally be expected to have studied 101 (History of Philosophy from Descartes to Kant), or to have undertaken relevant background reading in the History of Philosophy, as suggested by their tutor. In some cases alternatives are given as the prerequisite, e.g. 107 Philosophy of Religion (NP 101 or 102) means that those studying 107, Philosophy of Religion, would normally be expected either to have studied 101 (History of Philosophy) or 102 (Knowledge and Reality), or to have undertaken relevant preparatory work in one or other of those areas, as suggested by their tutor. In cases of doubt students are encouraged to consult their tutors and establish with them, in their individual circumstances, what the best options are.

101: History of Philosophy from Descartes to Kant

The purpose of this subject is to enable you to gain a critical understanding of some of the metaphysical and epistemological ideas of some of the most important philosophers of the early modern period, between the 1630s to the 1780s.

This period saw a great flowering of philosophy in Europe. Descartes, Spinoza and Leibniz, often collectively referred to as 'the rationalists', placed the new 'corpuscularian' science within grand metaphysical systems which certified our God-given capacity to reason our way to the laws of nature (as well as to many other, often astonishing conclusions about the world). Locke wrote in a different, empiricist tradition. He argued that, since our concepts all ultimately derive from experience, our knowledge is necessarily limited. Berkeley and Hume developed this empiricism in the direction of a kind of idealism, according to which the world studied by science is in some sense mind-dependent and mind-constructed. Kant subsequently sought to arbitrate between the rationalists and the empiricists, by rooting out some assumptions common to them and trying thereby to salvage and to reconcile some of their apparently irreconcilable insights.

Reading the primary texts is of great importance.

For those taking Finals 2007 and thereafter, paper 101 will have a new format. The paper will be divided into three sections and students will be required to answer at least one question from Section A (Descartes, Spinoza, Leibniz) and at least one from Section B (Locke, Berkeley, Hume). Section C will contain questions on Kant and students taking paper 112 may not attempt questions from this section.

R.S.Woolhouse, *The Empiricists*; J.Cottingham, *The Rationalists* (both O.U.P. Opus series).

102: Knowledge and Reality (Compulsory in MP Part B)

The purpose of this subject is to enable you to examine some central questions about the nature of the world and the extent to which we can have knowledge of it.

In considering knowledge you will examine whether it is possible to attain knowledge of what the world is really like. Is our knowledge of the world necessarily limited to what we can observe to be the case? Indeed, are even our observational beliefs about the world around us justified? Can we have knowledge of what will happen based on what has happened? Is our understanding of the world necessarily limited to what we can prove to be the case? Or can we understand claims about the remote past or distant future which we cannot in principle prove to be true?

In considering reality you will focus on questions such as the following. Does the world really contain the three-dimensional objects and their properties—such as red buses or black horses—which we appear to encounter in everyday life? Or is it made up rather of the somewhat different entities studied by science, such as colourless atoms or four-dimensional space-time worms? What is the relation between the common sense picture of the world and that provided by contemporary science? Is it correct to think of the objects and their properties that make up the world as being what they are independently of our preferred ways of dividing up reality? These issues are discussed with reference to a variety of specific questions such as 'What is time?', 'What is the nature of causation?', and 'What are substances?' The examination paper also contains a number of optional questions in Philosophy of Science concerning the nature of scientific explanation and scientific method. There is an opportunity in this subject to study such topics as reference, truth and definition, but candidates taking 102 and 108 should avoid repetition of material across examinations, though it is safe to assume that good answers to questions would not involve repetition for which you might be penalised.

Jonathan Dancy, *Introduction to Contemporary Epistemology* (Oxford), chs. 1-3.
Michael J. Loux, *Metaphysics* (Routledge)

103: Ethics

The purpose of this subject is to enable you to come to grips with some questions which exercise many people, philosophers and non-philosophers alike. How should we decide what is best to do, and how best to lead our lives? Are our value judgements on these and other matters objective or do they merely reflect our subjective preferences and viewpoints? Are we in fact free to make these choices, or have our decisions already been determined by antecedent features of our environment and genetic endowment? In considering these issues you will examine a variety of ethical concepts, such as those of justice, rights, equality, virtue, and happiness, which are widely used in moral and political argument. There is also opportunity to discuss some applied ethical issues. Knowledge of major historical thinkers, e.g. Aristotle and Hume and Kant, will be encouraged, but not required in the examination.

John Mackie, *Ethics* (Penguin), chs. 1-2.

104: Philosophy of Mind (NP 101 or 102)

The purpose of this subject is to enable you to examine a variety of questions about the nature of persons and their psychological states, including such general questions as: what is the relation between persons and their minds? Could robots or automata be persons? What is the relation between our minds and our brains? If we understood everything about the brain, would we understand everything about consciousness and rational thought? If not, why not? Several of these issues focus on the relation between our common sense understanding of ourselves and others, and the view of the mind developed in scientific psychology and neuroscience. Are the two accounts compatible? Should one be regarded as better than the other? Should our common sense understanding of the mind be jettisoned in favour of the scientific picture? Or does the latter leave out something essential to a proper understanding of ourselves and others? Other more specific questions concern memory, thought, belief, emotion, perception and action.

Paul Churchland, *Matter and Consciousness* (Cambridge) chs. 1-3.

105: Philosophy of Science and Philosophy of Psychology and Neuroscience (NP 101 or 102) (paper formerly called Philosophy of Science and Psychology).

The purpose of this subject is to enable you to study topics in the philosophy of science in

general, and topics in the philosophy of psychology and neuroscience in particular.

In the broadest sense the philosophy of science is concerned with the theory of knowledge and with associated questions in metaphysics. What is distinctive about the field is the focus on Ascientific@ knowledge, and metaphysical questions—concerning space, time, causation, probability, possibility, necessity, realism and idealism—that follow in their train. As such it is concerned with distinctive traits of science: testability, objectivity, scientific explanation, and the nature of scientific theories.

The philosophy of psychology and neuroscience addresses questions that arise from the scientific study of the mind. (The philosophy of mind, in contrast, starts from our ordinary everyday thinking about mental matters.) Some of the questions addressed are extremely general and are closely connected with topics, such as explanation and reduction, that you will cover in the philosophy of science part of the course. Other questions relate to key notions that are used in cognitive psychology and cognitive neuroscience, such as representation, computation, tacit knowledge, implicit rules and modularity. There are also questions that focus on specific aspects of contemporary research into topics such as consciousness, perception, memory, reasoning and the way that cognitive abilities break down after brain damage. It is not necessary for you to be studying neuroscience or experimental psychology; nor do you need expertise in statistics. What is important is that you should enjoy reading about psychology and neuroscience and that you should be interested in the relationship between scientific and philosophical ways of approaching questions about the mind.

Don Gillies, *Philosophy of Science in the Twentieth Century* (Blackwells)

Paul Churchland, *Matter and Consciousness* (Cambridge) chs. 1-3.

106: Philosophy of Science and Social Science (NP 101 or 102)

The purpose of this subject is to enable you to study topics in the philosophy of science in general, and topics in the philosophy of social science in particular.

In the broadest sense the philosophy of science is concerned with the theory of knowledge and with associated questions in metaphysics. What is distinctive about the field is the focus on Ascientific@ knowledge, and metaphysical questions—concerning space, time, causation, probability, possibility, necessity, realism and idealism—that follow in their train. As such it is concerned with distinctive traits of science: testability, objectivity, scientific explanation, and the nature of scientific theories.

Whether economics, sociology, and political science are Areally@ sciences is a question that lay people as well as philosophers have often asked. The technology spawned by the physical sciences is more impressive than that based on the social sciences: bridges do not collapse and aeroplanes do not fall from the sky, but no government can reliably control crime, divorce, or unemployment, or make its citizens happy at will. Human behaviour often seems less predictable, and less explicable than that of inanimate nature and non-human animals, even though most of us believe that we know what we are doing and why. So philosophers of social science have asked whether human action is to be explained causally or non-causally, whether predictions are self-refuting, whether we can only explain behaviour that is in some sense rational—and if so, what that sense is. Other central issues include social relativism, the role of ideology, value-neutrality, and the relationship between the particular social sciences, in particular whether economics provides a model for other social science. Finally, some critics have asked whether a technological view of 'social control' does not threaten democratic politics as usually understood.

Martin Hollis, *The Philosophy of Social Science* (Cambridge)

Alexander Rosenberg, *Philosophy of Social Science* (Westview).

107: Philosophy of Religion (NP 101 or 102)

The purpose of this subject is to enable you to examine claims about the existence of God and God's relationship to the world. What, if anything, is meant by them? Could they be true? What justification, if any, can or needs to be provided for them? The paper is concerned primarily with the claims of Western religions (Christianity, Judaism and Islam), and with the central claim of those religions, that there is a God. God is said to be omnipresent, omnipotent, omniscient, perfectly good, a source of moral obligation and so on. But what does it mean to say that God has these properties, and are they consistent with each other? Could God change the past, or choose to do evil? Does it make sense to say that God is

outside time? You will have the opportunity to study arguments for the existence of God - for example, the teleological argument from the fact that the Universe is governed by scientific laws, and the argument from people's religious experiences. Other issues are whether the fact of pain and suffering counts strongly, or even conclusively, against the existence of God, whether there could be evidence for miracles, whether it could be shown that prayer Aworks@, whether there could be life after death, and what philosophical problems are raised by the existence of different religions. There may also be an optional question in the exam paper about some specifically Christian doctrine - does it make sense to say that the life and death of Jesus atoned for the sins of the world, and could one know this? There is abundant scope for deploying all the knowledge and techniques which you have acquired in other areas of philosophy. Among the major philosophers whose contributions to the philosophy of religion you will need to study are Aquinas, Hume and Kant.

M. Peterson and other authors, *Reason and Religious Belief, An Introduction to the Philosophy of Religion* (Oxford University Press)

108: The Philosophy of Logic and Language (NP Prelims/Mods Logic)

The purpose of this subject is to enable you to examine some fundamental questions relating to reasoning and language. The philosophy of logic is not itself a symbolic or mathematical subject, but examines concepts of interest to the logician. If you want to know the answer to the question 'What is truth?', this is a subject for you. Central also are questions about the status of basic logical laws and the nature of logical necessity. What, if anything, makes it true that nothing can be at the same time both green and not green all over? Is that necessity the result of our conventions or stipulations, or the reflection of how things have to be independently of us? Philosophy of language is closely related. It covers the very general question how language can describe reality at all: what makes our sentences meaningful and, on occasion, true? How do parts of our language refer to objects in the world? What is involved in understanding speech (or the written word)? You may also investigate more specific issues concerning the correct analysis of particular linguistic expressions such as names, descriptions, pronouns, or adverbs, and aspects of linguistics and grammatical theory. Candidates taking 102 as well as 108 should avoid repetition of material across examinations, though it is safe to assume that good answers to questions would not involve repetition for which you might be penalised.

Mark Sainsbury, "Philosophical Logic", in *Philosophy, a Guide through the Subject*, edited by A. C. Grayling (Oxford).

109: Aesthetics (NP 101 or 102 or 103 or 104 or 115)

The purpose of this subject is to enable you to study a number of questions about the nature and value of beauty and of the arts. For example, do we enjoy sights and sounds because they are beautiful, or are they beautiful because we enjoy them? Does the enjoyment of beauty involve a particular sort of experience, and if so, how should we define it and what psychological capacities does it presuppose? Is a work of art a physical object, an abstract object, or what? Does the value of a work of art depend only upon its long- or short-term effects on our minds or characters? If not, what sorts of reasons can we give for admiring a work of art? Do reasons for admiring paintings, pieces of music and poems have enough in common with one another, and little enough in common with reasons for admiring other kinds of things, to support the idea that there is a distinctive sort of value which good art of every sort, and only art, possesses? As well as general questions such as these ones, the subject also addresses questions raised by particular art forms. For example, what is the difference between a picture and a description in words? Can fiction embody truths about its subject-matter? How does music express emotions? All of these questions, and others, are addressed directly, and also by examining classic texts, including Plato's *Republic*, Aristotle's *Poetics*, Hume's *Essay on the Standard of Taste* and Kant's *Critique of Aesthetic Judgement*.

Malcolm Budd, *Values of Art* (Penguin)

110. Medieval Philosophy: Aquinas

The purpose of this subject is to introduce you to many of Aquinas's central ideas and arguments on a wide variety of theological and philosophical topics. These include the proofs of the existence of God (the famous "five ways"), the concept of the simplicity of God (including the controversial issue of the identity of being and essence in God), the concept of the soul in general and of the human soul in particular, the proof of the immortality of the human soul, the nature of perception and of intellectual knowledge, the notion of free will and of happiness, the theory of human actions. These are studied in translation rather than in the Latin original, though a glance at Aquinas's remarkably readable Latin can often be useful. Candidates are encouraged to carefully read and analyze Aquinas's texts and to focus on the philosophical questions they raise. Papers 134 Aristotle, *Physics*, and 133 Aristotle, *Nicomachean Ethics* are a good background for this option.

Text: *Summa Theologiae*, Ia, 2-11, 75-89; Ia IIae, 1-21.

Anthony Kenny, *Aquinas*; F.C. Copleston, *Aquinas*; B. Davies, *The Thought of Thomas Aquinas* (O.U.P.)

[**From 1 October 2007** *(for first examination in 2009)*: The subject will be studied in one of two sets of texts (The fathers of the English Dominican Province edition, 1911, rev. 1920):

Aquinas, *Summa Theologica*, Ia, 2-11, 75-89, which will cover the following topics: arguments for the existence of God; God's essence and existence; God and goodness; God and time; the soul in relation to the body; individual intellects; perception and knowledge; free will; the soul and knowledge.

Aquinas, *Summa Theologica*, Ia IIae 1-10, 90-97, which will cover the following topics: natural and supernatural happiness; voluntary action; the will; natural and universal law; human law.

This paper will include an optional question containing passages for comment. This subject may not be combined with subject 111]

111. Medieval Philosophy: Duns Scotus and Ockham (NP 101 or 108)

Duns Scotus and Ockham are, together with Aquinas, the most significant and influential thinkers of the Middle Ages. The purpose of this subject is to make you familiar with some fundamental aspects of their theological and philosophical thought. As to Scotus, these include the proof of the existence and of the unicity of God (the most sophisticated one in the Middle Ages) and the issues about causality that it raises, the theory of the existence of concepts common to God and creatures (the univocity theory of religious language), the discussion about the immateriality and the immortality of the human soul, and the reply to scepticism. As to Ockham, they include nominalism about universals and the refutation of realism (including the realism of Duns Scotus), some issues in logic and especially the theory of "suppositio" and its application in the debate about universals, the theory of intellectual knowledge of singulars and the question of whether we can have evidence about contingent properties of singulars, the nature of efficient causality and the problem of whether we can prove the existence of a first efficient cause. These are studied in translation rather than in the Latin original, though a glance at the Latin can often be useful. Candidates are encouraged to carefully read and analyze Scotus's and Ockham's texts and to focus on the philosophical questions they raise. Paper 134 Aristotle, *Physics* is a good background for this option.

Texts: Duns Scotus, *Philosophical Writings* (transl. A. Wolter); Ockham, *Philosophical Writings* (transl. P. Boehner).

R. Cross, *Duns Scotus*; M. McCord Adams, *William Ockham*, vol. 1.

[**From 1 October 2007** *(for first examination in 2009)*: The subject will be studied in the following sets of texts :

Scotus: *Philosophical Writings*, tr. Wolter (Hackett), chapters II-IV, pp. 13-95 (man's natural knowledge of God; the existence of God; the unicity of God); *Five texts on the Mediaeval Problem of Universals*, tr. Spade (Hackett), pp. 57-113 (universals, individuation).

Ockham: *Philosophical Writings*, tr. Boehner (Hackett), pp. 18-27 (intuitive and abstractive cognition); pp. 97-126 (the possibility of natural theology, the existence of God); *Five texts on the Mediaeval Problem of Universals*, tr. Spade (Hackett), pp. 114-231 (universals).

The texts are studied in translation rather than the Latin original. This paper will include an

optional question containing passages for comment. This subject may not be combined with subject 110]

112: The Philosophy of Kant (NP 101)

The purpose of this paper is to enable you to make a critical study of some of the ideas of one of the greatest of all philosophers.

Immanuel Kant lived from 1724 to 1804. He published the *Critique of Pure Reason* in 1781, and the *Groundwork of the Metaphysics of Morals* in 1785. The *Critique* is his greatest work and, without question, the most influential work of modern philosophy. It is a difficult but enormously rewarding work. This is largely because Kant, perhaps uniquely, combines in the highest measure the cautious qualities of care, rigour and tenacity with the bolder quality of philosophical imagination. Its concern is to give an account of human knowledge that will steer a path between the dogmatism of traditional metaphysics and the scepticism that, Kant believes, is the inevitable result of the empiricist criticism of metaphysics. Kant's approach, he claims in a famous metaphor, amounts to a ACopernican revolution@ in philosophy. Instead of looking at human knowledge by starting from what is known, we should start from ourselves as knowing subjects and ask how the world must be for us to have the kind of knowledge and experience that we have. Kant thinks that his Copernican revolution also enables him to reconcile traditional Christian morality and modern science, in the face of their apparently irreconcilable demands (in the one case, that we should be free agents, and in the other case, that the world should be governed by inexorable mechanical laws).

In the *Groundwork* Kant develops his very distinctive and highly influential moral philosophy. He argues that morality is grounded in reason. What we ought to do is what we would do if we acted in a way that was purely rational. To act in a way that is purely rational is to act in accordance with the famous "categorical imperative", which Kant expresses as follows: "Act only on that maxim through which you can at the same time will that it should become a universal law."

Critique of Pure Reason, trans. Norman Kemp Smith (Macmillan);

Groundwork of the Metaphysics of Morals, trans, H.J. Paton (Hutchinson).

Roger Scruton, *Kant*.

113: Post-Kantian Philosophy (NP 101 or 102 or 103 or 112)

Many of the questions raised by German and French philosophers of the 19th and early 20th centuries were thought to arise directly out of Kant's metaphysics, epistemology and ethics: Hence the title of this subject, the purpose of which is to enable you to explore some of the developments of (and departures from) Kantian themes in the work of Hegel, Schopenhauer, Nietzsche, Husserl, Heidegger, Sartre and Merleau-Ponty. Students typically focus their study on only two chosen authors.

Hegel and Schopenhauer delineate global, metaphysical systems out of which each develops his own distinctive vision of ethical and (especially in the case of Hegel) political life. Nietzsche's writings less obviously constitute a 'system', but they too develop certain ethical and existential implications of our epistemological and metaphysical commitments. Husserl will interest those pupils attracted to problems in ontology and epistemology such as feature in the Cartesian tradition; his work also serves to introduce one to phenomenology, the philosophical method later developed and refined by Heidegger, Sartre and Merleau-Ponty.

In Heidegger and Sartre, that method is brought to bear on such fundamental aspects of human existence as authenticity, social understanding, bad faith, art and freedom. Merleau-Ponty (who trained as a psychologist) presents a novel and important account of the genesis of perception, cognition and feeling, and relates these to themes in aesthetics and political philosophy. While this is very much a text-based paper, many of the questions addressed are directly relevant to contemporary treatments of problems in epistemology and metaphysics, in aesthetics, political theory and the philosophy of mind.

Robert C. Solomon, *Continental Philosophy since 1750: The Rise and Fall of the Self* (O.U.P.).

114: Theory of Politics (NP 103)

In order to understand the world of politics, we also need to know which views of politics and society people have when they make political decisions, and why we recommend certain

courses of action rather than others. This purpose of this subject is to enable you to look at the main ideas we use when we think about politics: why do we have competing views of social justice and what makes a particular view persuasive, possibly even right? What happens when a concept such as freedom has different meanings, so that those who argue that we must maximise freedom of choice are confronted with those who claim that some choices will actually restrict your freedom? Is power desirable or harmful? Would feminists or nationalists give a different answer to that question? Political theory is concerned with developing good responses to problems such as: when should we obey, and when should we disobey, the state? But it is also concerned with mapping the ways in which we approach questions such as: how does one argue in favour of human rights? In addition, you will explore the main ideologies, such as liberalism, conservatism and socialism, in order to understand their main arguments and why each of them will direct us to different political solutions and arrangements.

Will Kymlicka, *Contemporary Political Philosophy*: An Introduction (O.U.P.)

115 : Plato, Republic

Plato's influence on the history of philosophy is enormous. The purpose of this subject is to enable you to make a critical study of *The Republic*, which is perhaps his most important and most influential work. Written as a dialogue between Socrates and others including the outspoken immoralist Thrasymachus, it is primarily concerned with questions of the nature of justice and of what is the best kind of life to lead. These questions prompt discussions of the ideal city -which Karl Popper criticised as totalitarian -, of education and art, of the nature of knowledge, the Theory of Forms and the immortality of the soul. In studying it you will encounter a work of philosophy of unusual literary merit, one in which philosophy is presented through debates, through analogies and images, including the famous simile of the Cave, as well as rigorous argument, and you will encounter some of Plato's important contributions to ethics, political theory, metaphysics, philosophy of mind and aesthetics.

You are expected to study the work in detail; the examination contains a question requiring comments on chosen passages, as well as a choice of essay questions.

Julia Annas, *An Introduction to Plato's Republic*, introduction and ch. 1

Set translation: Plato: *Republic*, tr Grube, revised Reeve (Hackett).

116: Aristotle, Nicomachean Ethics

The purpose of this subject is to give you the opportunity to make a critical study of one of the most important works in the history of philosophy. Like Plato in the *Republic*, Aristotle is concerned with the question, what is the best possible sort of life? Whereas this leads Plato to pose grand questions in metaphysics and political theory, it leads Aristotle to offer close analyses of the structure of human action, responsibility, the virtues, the nature of moral knowledge, weakness of will, pleasure, friendship, and other related issues. Much of what Aristotle has to say on these is ground-breaking, highly perceptive, and still of importance in contemporary debate in ethics and moral psychology.

You are expected to study the work in detail; the examination contains a question requiring comments on chosen passages, as well as a choice of essay questions.

J. L. Ackrill, *Aristotle the Philosopher*, ch. 10. Set translation: Aristotle: Nicomachean Ethics translated and with notes by T.H. Irwin (Hackett).

117: Frege, Russell, and Wittgenstein (NP Prelims/Mods Logic)

The purpose of this subject is to enable you to study some classic texts from which emerged modern logic and philosophy of language. Frege invented and explained the logic of multiple generality (quantification theory) and applied this apparatus to the analysis of arithmetic. Russell continued this programme, adding some refinements (the theory of types, the theory of descriptions), and he applied logic to many traditional problems in epistemology. Wittgenstein's *Tractatus* outlined an ambitious project for giving a logical account of truths of logic (as tautologies).

The texts are dense and sophisticated, but they are elegant and full of challenging ideas and your ability to understand logical symbolism will be important.

Anthony Kenny, *Frege* (Penguin) and *Wittgenstein* (Penguin); J. O. Urmson, *Philosophical*

Analysis.

118: The Later Philosophy of Wittgenstein (NP 101 or 102 or 108 or 117)

The purpose of this subject is to enable you to study some of the most influential ideas of the 20th century. The main texts are Wittgenstein's posthumously-published *Philosophical Investigations* and *The Blue and Brown Books*. These writings are famous not just for their content but also for their distinctive style and conception of philosophy. There is much critical discussion about the relation between those aspects of Wittgenstein's work.

Wittgenstein covers a great range of issues, principally in philosophy of language and philosophy of mind. In philosophy of language, one key topic is the nature of rules and rule-following. What is involved in grasping a rule; and how can I tell, in a new case, what I have to do to apply the rule correctly? Indeed, what makes it the case that a particular move at this stage is the correct way of applying the rule; is there any standard of correctness other than the agreement of our fellows? Other topics include: whether language is systematic; the relation between linguistic meaning and non-linguistic activities; whether concepts can be illuminatingly analysed. In the philosophy of mind, Wittgenstein is especially famous for the so-called Aprivate language argument@, which tries to show that words for sensations cannot get their meanings by being attached to purely internal, introspective, Aprivate objects@. Other, equally important, topics include the nature of the self, of introspection and of visual experience, and the intentionality (the representative quality) of mental states. Most generally, can we (as Wittgenstein thought) avoid Cartesianism without lapsing into behaviourism?

The texts: try *Philosophical Investigations* paras 1-80; *Blue Book* pp. 1-17.

Saul Kripke: *Wittgenstein on Rules and Private Language* (Blackwell); Marie McGinn: *Wittgenstein and the Philosophical Investigations* (Routledge, 1997, in the *Routledge Philosophy Guidebooks* series)

119. Formal Logic (NP Prelims/Mods Logic)

This subject is precisely what its name suggests, an extension of the symbolic logic covered in the Prelims/Mods logic course. Only in highly exceptional circumstances would it be appropriate to do this subject without first having done Prelims/Mods logic, indeed without first having done it *very well*, and for feedback about this, it would be advisable to consult your Prelims/Mods logic tutor.. Formal Logic is an extremely demanding and rigorous subject, even for those who have Mathematics A Level. If you lose your way in it, there is liable to be no way of avoiding disaster. But granted these caveats, the subject is a delight to those who enjoy formal work and who are good at it. Its purpose is to introduce you to some of the deepest and most beautiful results in logic, many of which have fascinating implications for other areas of philosophy. There are three sections. The first, Propositional and Predicate Logic, is the most closely related to the material covered in the Prelims/Mods course. The other two sections are: Set Theory, which includes the rudimentary arithmetic of infinite numbers; and Metamathematics, which includes some computability theory and various results concerning the limitations of formalization, such as Gödel's theorem. Candidates will be permitted to select questions from any of the three sections, and will be required to answer three questions in all.

George S. Boolos and Richard C. Jeffrey, *Computability and Logic* (Cambridge, 3rd edn.)

120: Intermediate Philosophy of Physics

The purpose of this subject is to enable you to come to grips with conceptual problems in special relativity and quantum mechanics. Only those with a substantial knowledge of physics should offer this subject, which is normally available only to candidates reading Physics and Philosophy.

122: Philosophy of Mathematics (compulsory in Part B) **(NP 101 or 102 or 108 or 117 or 119 or 120)**

What is the relation of mathematical knowledge to other kinds of knowledge? Is it of a special kind, concerning objects of a special kind? If so, what is the nature of those objects and how do we come to know anything about them? If not, how do we explain the seeming

difference between proving a theorem in mathematics and establishing something about the physical world? The purpose of this subject is to enable you to examine questions such as these. Understanding the nature of mathematics has been important to many philosophers, including Plato, Aristotle, and Kant, as a test or as an exemplar of their overall position, and has also played a role in the development of mathematics at certain points. While no specific knowledge of mathematics is required for study of this subject, it will be helpful to have studied mathematics at A-level, or similar, and to have done Logic in Prelims/ Mods.

Stephen F. Barker, *Philosophy of Mathematics* (Prentice-Hall).

The Rise of Modern Logic

The period of scientific thought to be covered is 1879 to 1931 and includes principally the logical and foundational works of Frege, Russell, Hilbert, Brouwer, and Godel that fall within this period. Questions may also be asked concerning Cantor, Dedekind, Poincaré, Zermelo, Skolem, Wittgenstein (*Tractatus* only), and Ramsey.

Most of the relevant material is contained in Jean van Heijenoort (ed.), *From Frege to Godel. A Source Book in Mathematical Logic, 1879-1931* (Harvard University Press).

The Rise of Modern Logic is a bridge paper for this joint school. Maths and Phil fourth years are very well prepared for it having already studied B1 Foundations and 122 Philosophy of Mathematics. For someone with interests in this area a particularly good combination is this paper with some or all of the M-Level Logic courses in Mathematics, Gödel's Incompleteness Theorems, Axiomatic Set Theory, and Model Theory.

198. Special subjects

As specified in the regulations for Philosophy in All Honour Schools including Philosophy in the Grey Book.

199. Thesis

As specified in the regulations for Philosophy in All Honour Schools including Philosophy in the Grey Book.

Appendix B: Aims and Objectives common to all undergraduate degree courses with Philosophy in Oxford

The Faculty of Philosophy shares the University's general aims as found in its Mission Statement.

In providing teaching in Philosophy it aims, by drawing on the strengths of the University and of its constituent Colleges, to provide a high-quality education, one which enriches the student's knowledge and understanding of fundamental issues.

Undergraduates may study Philosophy in Oxford as a degree subject in one of seven Joint Honours programmes. Their common aims are:

1. to offer a structured but flexible programme of studies**,** one which entails the demands and the benefits of studying Philosophy in tandem with another discipline, and which allows study of an interdisciplinary nature;

2. to develop in students qualities and skills of value to them in their professional and personal life;

3. to attract and select high calibre students in the context of the University's policy on equal opportunities.

For all programmes it aims to appoint research-active staff to contribute their knowledge and skills to the teaching programmes.

OBJECTIVES

At all levels students will enjoy a challenging education in Philosophy. They will:

1. have developed the ability to read carefully and with sensitivity to context philosophical texts of different ages and/or traditions, through following a guided programme of regular reading assignments;

2. have been required to develop and to present (usually in writing) to their tutor/supervisor their own critical understanding of the issues studied;

3. have learned to engage in critical dialogue with their tutors and peers during regular tutorials, i.e. meetings between an expert tutor and one, two or occasionally three students, at which the participants' views are discussed, and have benefited from the oral and/or written feedback on their work for tutorials;

4. have enjoyed, through the University and their College, access to excellent library holdings and a good range of IT resources, and have learned to use libraries effectively;

5. have had the opportunity to attend lectures and/or seminars (many given by leading researchers) both within and outside their chosen options, together with a range of special lectures and Philosophy society meetings.

Through the above they will:

6. have acquired knowledge and understanding of philosophy;

7. have developed the ability to think critically, to look for underlying principles, to identify and analyse key concepts;

8. have developed independence of approach, good writing skills, a facility for independent learning and investigation, and good organisational skills.

In addition they will:

9. have had the opportunity to participate in a wide range of extra-curricular activities at College and University level to stimulate personal development;

10. have received sustained academic support from their tutors and pastoral support where appropriate from other providers;

11. have had the opportunity of appropriate careers advice.

Undergraduate Programmes

All seven programmes are multi-disciplinary. Three of them, (Physics/Phil, Maths/Phil, and Phil/Theol) require interdisciplinary study. Appropriate 'bridge subjects' are available for each of the other programmes, but are not required.

For their first year examination(s) in Philosophy students will have:

12. pursued a course which introduces them to central philosophical texts and issues, and

enables them to acquire key philosophical skills and concepts.

After the first examinations students work towards Finals. On completion, all will have:

13. taken an active role in planning a path through their programme, selecting subjects within each discipline and the balance between Philosophy and the other discipline(s), and will have benefited from the simultaneous study of both disciplines at a higher level;

14. developed enhanced precision of thought and expression in the analysis of problems and in the construction and marshalling of arguments;

15. received regular feedback through tutorials and regular reports, together with College examinations where considered appropriate, to enable them to assess their progress and identify strengths and weaknesses;

16. taken the Final written examinations in up to five Philosophy subjects at a time, thus enjoying the benefit of a mature understanding and possible cross-fertilisation between subjects.