DEPARTMENT OF
COMPUTER
SCIENCE

UNDERGRADUATE COURSE HANDBOOK

Computer Science
Computer Science & Philosophy
Mathematics & Computer Science

2012

Welcome

Welcome to Oxford! You have chosen to study at one of the world's leading centres for the development, application and teaching of Computer Science. You join a rapidly expanding group of researchers, lecturers and students, attracted to Oxford from all over the world. You are here because you want to study Computer Science, and our aim is to give you the best opportunity to study it that we can.

The Department of Computer Science has an international reputation for the strength of its research and teaching, built up over many years. Our current research ranges from exploring the fundamental issues of the meaning of programming languages, to the engineering of large-scale systems and the modelling of biological processes. Many of the people that teach you are involved in cutting-edge research and this influences and informs the courses we teach, which are continually evolving.

The Department has been generously supported over the years by donations and sponsorship from many industrial partners. When you graduate, we are confident that you will have a sound basis for a productive and rewarding career.

This handbook is intended to guide you through the course, and to give you a handy reference to many of the things that will be unfamiliar about the way we run things here. If you think that the handbook could be improved in some way, or if you find that there is something misleading in it, do let us know.

During your study at Oxford we all hope to share with you some of the understanding we have gained from our own study, research and industrial collaboration. We hope too that you will be able to share with us – and with each other – your enthusiasm for the subject, and your own varied experiences. Above all, we hope that you will enjoy developing your talents in this exciting field.

Ian Horrocks
Director of Teaching

Mission Statement

Christopher Strachey, the founder of the Programming Research Group at Oxford, wrote:

> *It has long been my personal view that the separation of practical and theoretical work is artificial and injurious. Much of the practical work done in computing, both in software and in hardware design, is unsound and clumsy because the people who do it have not any clear understanding of the fundamental design principles of their work. Most of the abstract mathematical and theoretical work is sterile because it has no point of contact with real computing. One of the central aims of the Programming Research Group as a teaching and research group has been to set up an atmosphere in which this separation cannot happen.*

The specific teaching mission of Department of Computer Science upholds this view. It is:

1. to teach computing as a coherent science, with due emphasis on its mathematical foundations.
2. to teach information technology as an engineering discipline with its over-riding goal of correct and cost-effective design based on rigorous scientific reasoning.
3. to offer a progressive range of options including hardware and software, theory and practice, general technology and illustrative applications.
4. to keep the syllabus in correspondence with the long-term needs of the employers of our graduates.
5. to develop the students' intellectual abilities and personalities to fit them for future leadership of a demanding profession.
6. to conduct research contributing to these goals, and to publish textbooks to help ourselves and others to reach them.

Contents

1 Sources of information

This handbook is intended to guide you through your course at Oxford. It does not replace the official regulations relating to your degree, but it should be a less formal and more easily understood guide to your course.

The handbook tries to save you time by telling you many of the things which you might discover by experience, or by asking; but it cannot tell you everything. This University is a complex institution, so do not be afraid to ask for information or advice. Your tutor is your first and best guide, so do ask him or her – or others – when you need help or advice. Below is a list of other places that you will find useful information regarding your degree.

1.1 The Grey Book

The *Examination Regulations*, usually known for obvious reasons as the "Grey Book", is the authoritative document on University examinations. You should receive a free copy of the relevant part of this book through your College at the beginning of your first term. The *Grey Book* defines the syllabus for examinations, and changes to it are strictly regulated by the University to ensure that you cannot be disadvantaged by any changes which are made after you start your course. It is available online at www.admin.ox.ac.uk/examregs/contents.shtml.

1.2 Department of Computer Science Website

This is one of the most important sources of information for your degree. The website has details of all course synopses and syllabuses, timetables, information about projects and past papers and examinations: www.cs.ox.ac.uk/teaching.html

1.3 Proctors' and Assessor's memorandum

Each year you will receive the *Proctors' and Assessor's Memorandum*. The Proctors are the officers of the University – college fellows elected for a year at a time – responsible for amongst other things undergraduate discipline and the conduct of examinations. They will, in particular, require you to obey the University Rules for Computer Use. It is available online at www.admin.ox.ac.uk/proctors/info/pam/.

Your college will probably also have detailed guidance about its own regulations and requirements.

2 Finding your way around

Your academic life in Oxford will involve two intimately connected but distinct institutions. You are a member both of a college and of the University; the teaching of your degree course involves both your tutor in college, and lectures and practicals in the Department of Computer Science which is part of the University.

In principle, the University exists to enable you to study for a degree, to examine your competence at the end of that study, and to award you a degree. Your College exists to guide your study and to teach you. Admitting undergraduates to Oxford, and their academic and personal well-being, are principally the concerns of the colleges. Traditionally, most of the teaching was organised by and between the colleges; however in science subjects in particular the central provision of expensive equipment has led to an increased role for departments like the Department of Computer Science.

2.1 Academic Staff

The academic staff you will encounter are likely to be in three kinds of job. There are college tutors and college lecturers who are employed by your college to teach you and guide your study here; there are University Lecturers and other university staff who are employed to give lectures, to organise the degree courses and to examine; and there are departmental staff who are employed to run practical work and organise laboratory work and classes. However, most of the academic staff that you meet will be in at least two of these categories; thus you may well encounter the same person as your tutor in College, as a lecturer in the Department of Computer Science, and perhaps as an examiner when it comes to your University Examinations.

2.2 Support Staff

The Academic Administration team at the Department of Computer Science are responsible for supporting all aspects of teaching and examinations and work closely with the academic staff to do this. You will receive communications from them from time to time throughout the year, usually with regard to lectures, classes, practicals, examinations and projects. Please ensure that you read these emails and memos and respond where necessary. They are also available should you need assistance and so if you think they can help you please contact them by email.

2.2.1 Academic Admin Team

Shoshannah Holdom – Academic Administrator
Shoshannah.holdom@cs.ox.ac.uk Room 107
Leanne Carveth – Deputy Academic Administrator
Leanne.carveth@cs.ox.ac.uk Room 108
Jo Leggett – Assistant to Academic Administrator
Jo.leggett@cs.ox.ac.uk Room 106
Brenda Deeley – Staff Secretary
Brenda.deeley@cs.ox.ac.uk Room 106

2.3 The Department of Computer Science

The Department of Computer Science houses lecture theatres and seminar rooms in which most of the university lectures in Computer Science take place. It also runs a

network of computers and other facilities devoted to teaching requirements, and administers lectures, practicals, projects and some University-wide classes.
The head of the Department of Computer Science is Prof. Bill Roscoe.

2.3.1 The Wolfson building

The main building of the Department of Computer Science is the Wolfson Building which stands at the south-eastern corner of what is known as the Keble Road Triangle consisting of Keble Road, Banbury Road and Parks Road. All rooms on the basement floor are numbered with a number beginning with 0-, rooms on the ground floor (Level 1) with a number beginning with 1-, rooms on the first floor (including the Library) with a number beginning with 2-, and so on.

The reception desk is at the main entrance, which is on Parks Road. The Wolfson Building opens at 08:30 and the doors are locked at 17:15 Monday to Friday.

Lecture Theatre A is on the basement floor and Lecture Theatre B is on the ground floor: they can be reached through the door to the right of the main Parks Road entrance, as can the seminar room 051 and the Undergraduate Social Area (room 048). There are vending machines in the basement and a small kitchen which can be used to make hot drinks, but you are asked not to take food or drinks into lecture rooms, seminar rooms, computer rooms, or laboratories.

2.3.2 The Robert Hooke building

The department has two seminar rooms in The Robert Hooke building, The Christopher Strachey Room and The Tony Hoare Room. These rooms will be used for classes and from time to time may be used for small lecture courses. The building is located on Parks Road, to the right of the University Museum. The building can be accessed using your University card.

2.3.3 Computing resources

The Department's teaching network (used by undergraduates and sometimes by MSc course students) comprises 48 PCs running Linux. They are located in the Practicals Laboratory (T6.09) on level 6 of the Thom Building. You will be asked to complete an application form at the start of your course to use these computing facilities.

You may have some prior knowledge of using computers; however you may not have specific experience with the type of systems available at Oxford. Therefore, at the start of the first year, there are introductory sessions, designed to help you become more familiar with the systems and give you an opportunity to use the network and ask questions. Demonstrators are present at these sessions, giving you a chance to meet them and find out more about practicals.

Those courses which have practical work associated with them are supported by practical classes in the Practicals Laboratory throughout the term. These classes guarantee students exclusive access to the computing facilities they require to complete their work. Demonstrators are present at each class so that you can obtain help with the practicals as you are doing the work.

Although the computers are often booked for practical classes, there are times when these computers are available for students to use. This is mainly to facilitate work on projects. Many students also find it useful to be able to do further work on their practicals outside the normal practical times, or to take the opportunity to learn more about the facilities available.

2.3.4 Personal computers

You do not need your own computer. The Department's computing facilities are all you will need during your undergraduate career. However, many undergraduates have their own computer. The practical work associated with some courses is flexible enough to enable you to do the work on your own computer provided it is set up with appropriate software.

Your college IT officer will be able to advise you on remote access to the Department's facilities from your own computer, or from the college's own computers. There are 10 Linux PCs in the Department available for access at all times through the University network.

Please note that you will not be allowed to plug in to the wired ethernet in the Practicals Laboratory in the Thom Lab or in the Department. Wireless connection is available in these areas.

2.3.5 Communication and electronic mail

Oxford University Computing Services (OUCS) automatically provide email facilities for all new undergraduates, at the same time as you are given a University Card. You will also register with the Department of Computer Science to use departmental computers for your course, and can use these accounts to send and receive e-mail.

E-mail is, generally speaking, a good way of contacting members of the Department of Computer Science and most of the other academic staff you will need to reach. Undergraduates will be expected to know how to use it and to check their e-mail frequently.

2.3.6 Access to course material pages from outside ox.ac.uk

There is a lot of course material on the Department web pages. This can be accessed from outside the Oxford domain, though it is password-protected.

If you try to access these pages from outside ox.ac.uk you will reach a page saying: 'Teaching material pages are only accessible to registered students and staff of Oxford University connecting from a host in the ox.ac.uk domain'.

You should use your Single-Sign on username and password to access this material.

This material is made available for your use only (it is copyright of the authors). You should not pass it on to anyone else.

2.4 Other Departments

2.4.1 The Mathematical Institute

The Mathematical Institute and the Faculty of Mathematics organise the degrees in Mathematics and joint degrees including those with Computer Science. The majority of the Institute is housed in a white building at the north end of St Giles, just around the corner from the end of Keble Road. There are lecture theatres in the basement of this building.

2.4.2 The Department of Engineering Science

The Department of Engineering Science organises the University's Engineering degrees. The department also houses our undergraduate Practicals Laboratory in the Thom building. This building is the glass and concrete tower which dominates the Keble Road triangle and its entrance is from the elevated walkway. The Practicals Laboratory is on level 6 of the Thom building, and there are lecture rooms on levels 1 and 8.

2.4.3 The Faculty of Philosophy

The Faculty of Philosophy is part of the Humanities Division and organises the University's degrees in Philosophy. The Faculty of Philosophy is housed on Merton Street and this is where lectures in Philosophy for the joint degree will take place.

2.4.4 Oxford University Language Centre

The Language Centre provides courses and other resources to help you learn modern foreign languages, or to keep up and develop your skills. It is situated on Woodstock Road just north of St Giles church, and at the back of the Computing Services building.

2.4.5 Oxford University Museum of Natural History

The University Museum is a spectacular mid-nineteenth century structure housing a weird and wonderful collection of rocks, old bones, and stuffed dead things. More relevantly it also houses a large lecture theatre in which are held some of the lectures attended by Mathematics and Computer Science undergraduates in their first year.

2.4.6 The Examination Schools

The Examination Schools is the department of the University that administers public examinations. It is housed in a building on the south side of High Street, east of University College. This building is likely to be the location of your final examinations. When not in use for examinations the rooms and halls of the Examination Schools are used for lectures in subjects which do not have their own lecture theatres, and for special lectures which draw large audiences.

There is a second examination hall in Ewert House in Summertown which will probably be used for your first year examination, known as "Preliminary Examinations", or "Prelims". (You will be told where your examinations are to be held nearer the time.)

2.5 Libraries

Your principal source for books and journals should be your college library. Your College will tell you what it provides, and your college tutor will try to ensure that it provides the textbooks which are of most use for the course.

The main university library is the Bodleian Library and its science department is the Radcliffe Science Library. The Radcliffe Science Library is on Parks Road, between the University Museum and South Parks Road. This provides multiple copies of undergraduate text books on science reading lists and may be able to provide books which your college library does not have, but be warned that there is a great deal of demand for most of its useful stock.

The library in the Department of Computer Science is principally for the use of the Department's graduate students and staff, but may be useful for some undergraduates working on final year projects.

3 Courses

3.1 Computer Science

The Department of Computer Science offers the following courses in Computer Science at undergraduate level:

BA – Computer Science, 3-year
MCompSci – Computer Science, 4-year

You will initially be entered for the 4-year degree, and will be asked to decide by early in your third year whether you wish to carry on into the fourth year or leave at the end of the third year with a BA.

First year

In the first year of the Computer Science degree, you will take ten lecture courses ~ nine in computer science and one taught in conjunction with Mathematics (with lectures organised by the Mathematical Institute).

Computer Science
Functional Programming
Design & Analysis of Algorithms
Imperative Programming I
Imperative Programming II
Discrete Mathematics
Linear Algebra
Digital Systems
Continuous Mathematics
Introduction to Formal Proof

Mathematics
Probability

Second year

In the second year of the Computer Science degree you will study three core courses:

- Object Oriented Programming
- Concurrent Programming
- Models of Computation

In addition, you will take five optional courses from a list called Schedule A. This list can be found at www.cs.ox.ac.uk/teaching/bacompsci/PartA/

Third year

In the third year of the Computer Science degree you will take six option courses and undertake a project. You can choose up to two options from those that are offered to second years, provided you have not already done them: this list of courses is known as Schedule B1. The remaining advanced options are reserved for the third year, and are known as Schedules B2 and B4. Schedule B2 contains advanced, third-year courses. Schedule B4 contains more advanced courses, intended primarily for fourth year students, but which you may choose in your third year.
For details see www.cs.ox.ac.uk/teaching/bacompsci/PartB/

Fourth Year

You will have the option of continuing on for a fourth year, if you have achieved at least an upper second class Honours in your second and third years together. Successful completion of the fourth year will lead to the award of the Master of Computer Science degree. In your fourth year, you will study a number of advanced courses and undertake a major project.

A list of the courses currently offered to fourth year students can be found at: www.cs.ox.ac.uk/teaching/bacompsci/PartC/

Synopses for all courses can be found at www.cs.ox.ac.uk/teaching/courses/

3.2 Mathematics & Computer Science

The department offers a joint degree with the Department of Mathematics leading either to a BA degree after three years, or a Masters degree after four years

BA – Mathematics and Computer Science, 3-year
MMathCompSci – Mathematics and Computer Science, 4-year

You will initially be entered for the 4-year degree, and will be asked to decide by early in your third year whether you wish to carry on into the fourth year or leave at the end of the third year with a BA.

First year

In the first year of the Mathematics & Computer Science degree, you will take 11 lecture courses five in Computer Science and six taught in conjunction with Mathematics (with lectures organised by the Mathematical Institute)

Computer Science	**Mathematics**
Functional Programming	Introduction to Pure Mathematics
Design & Analysis of Algorithms	Introduction to Complex Numbers
Imperative Programming I	Linear Algebra
Imperative Programming II	Analysis
Continuous Mathematics	Probability
	Groups and Group Actions

Synopses for computer science courses can be found at
www.cs.ox.ac.uk/teaching/courses/

Details on Mathematics courses can be found at www.maths.ox.ac.uk/courses

Second year

In the second year of the Mathematics and Computer Science degree you will take the following four Computer Science courses:

- Object Oriented Programming
- Concurrent Programming
- Models of Computation
- Logic & Proof

And two Mathematics courses from:

- Analysis
- Algebra
- Differential Equations

In addition you will take optional Maths courses equivalent to 32 lectures. It is particularly important to choose Maths options that will lead on to the options that you wish to take in the third year, especially if you want to spend more than half of your time on Maths courses in the third year. You should consult your tutor for advice about this.

Details on Mathematics courses can be found at www.maths.ox.ac.uk/courses

Third year

In your third year you will spend between 25% and 75% of your time on Computer Science options, and the remainder on Maths options. There is no Computer Science project for 3rd year Mathematics and Computer Science students. For the Computer Science part of the year you may choose up to two courses from Schedule B1 (provided you have not done them already) and further courses from Schedules B2 and B4, up to six courses in total. Your Mathematics options will be chosen from a list of third year Maths courses known as Schedule B3.

Synopses for Computer Science Courses can be found at
www.cs.ox.ac.uk/teaching/courses/

Synopses for Mathematics Courses can be found at
www.maths.ox.ac.uk/courses

Fourth Year

You will have the option of continuing on for a fourth year, if you have achieved at least an upper second class Honours in your second and third years together. Successful completion of the fourth year will lead to the award of the Master of Mathematics and Computer Science degree. In your fourth year, you will study a number of advanced courses and undertake either a major computer science project or a mathematics dissertation.

A list of the Computer Science courses currently offered to fourth year students can be found at:
www.cs.ox.ac.uk/teaching/mcs/PartC/

Details on Mathematics courses can be found at www.maths.ox.ac.uk/courses

3.3 Computer Science and Philosophy

The department offers a joint degree with the Faculty of Philosophy leading either to a BA degree after three years, or a Masters degree after four years

- BA – Computer Science and Philosophy, 3-year
- M.Comp.Phil. – Computer Science and Philosophy, 4-year

All students are initially entered for the 4-year degree, and are asked to decide by early in their third year whether they wish to carry on into the fourth year or leave at the end of the third year with a BA.

First year

In the first year of the Computer Science and Philosophy degree you will take ten lectured courses - five in Computer Science, four taught in Philosophy and one taught in conjunction with Mathematics (with lectures organised by the Mathematical Institute)

Computer Science	**Philosophy**	**Mathematics**
Functional Programming	General Philosophy	Probability
Discrete Mathematics	Introduction to Logic	
Design & Analysis of Algorithms	Elements of Deductive Logic	
Imperative Programming I	Turing on Computability and Intelligence	
Imperative Programming II		

Synopses for computer science courses can be found at
www.cs.ox.ac.uk/teaching/courses/

Details of Philosophy courses can be found at
www.philosophy.ox.ac.uk/undergraduate/course_descriptions

Second and Third Year - Computer Science

In your second year you will take four Computer Science courses, to include Models of Computation, from a list published before the start of Michaelmas Term in your second year. The list is likely to include the courses below:

Advanced Data Structures & Algorithms
Compilers
Concurrency
Concurrent Programming
Databases
Logic and Proof
Object-Oriented Programming

In your third year students you have more flexibility in your choice of courses. You will take two, four or six Computer Science courses. The courses will be published

before the start of Michaelmas Term in your third year, but is likely to include the list below

Computer Science Options

Intelligent Systems
Knowledge Representation and Reasoning
Machine Learning
Computational Complexity
Computer-Aided Formal Verification
Computers in Society
Computer Security
Lambda Calculus and Types

Second and Third Year - Philosophy

You will take three, four or five Philosophy courses during your second and third years, from the following list of courses. It is recommended that you take two courses in your second year.

Philosophy options

The subject list for Philosophy is:
101. History of Philosophy from Descartes to Kant; 102. Knowledge and Reality; 103. Ethics; 104. Philosophy of Mind; 106. Philosophy of Science and Social Science; 107. Philosophy of Religion; 108. The Philosophy of Logic and Language; 109. Aesthetics; 110. Medieval Philosophy:Aquinas; 111. Medieval Philosophy: Duns Scotus and Ockham; 112. The Philosophy of Kant; 113. Post-Kantian Philosophy; 114. Theory of Politics; 115. Plato, *Republic;* 116. Aristotle, *Nicomachean Ethics;* 117. Frege, Russell, and Wittgenstein; 118. The Later Philosophy of Wittgenstein; 119. Formal Logic; 120. Intermediate Philosophy of Physics; 122. Philosophy of Mathematics; 124. Philosophy of Science; 125. Philosophy of Cognitive Science

You must include at least two of 101, 102, 104, 108, 119, 122, 124 and 125. Full course details can be found on the Philosophy website at:
www.philosophy.ox.ac.uk/undergraduate/course_descriptions

Note that each Philosophy option is twice the weight of a Computer Science option.

Fourth Year

You will have the option of continuing on for a fourth year, if you have achieved at least an upper second class Honours in the second and third years together. Successful completion of the fourth year will lead to the award of the Master of Computer Science and Philosophy degree. In the fourth year you will study a number of advanced courses and have the option of undertaking a computer science project or a philosophy thesis.

4 Studying, learning and teaching

4.1 Lectures

Lectures are the main forum where course material is presented. The term's Computer Science lecture timetable with details of lecture rooms is posted online at www.cs.ox.ac.uk/teaching/timetables/

Those for mathematics are posted on the notice board in the Mathematical Institute, and can also be found online at www.maths.ox.ac.uk/notices/lecture-lists.

It is usual for lectures to take place at the same times and in the same places for each of the eight weeks of full term, but for some courses the time or place may vary.

Most of your computer science lectures will be in the Department of Computer Science, many of your mathematics lectures will be in the Mathematical Institute, and some of your lectures (given to audiences too big for our departmental lecture theatres) will be in the University Museum. The lecture lists show where each lecture will be held.

Lectures generally start at 5 minutes past the hour, to enable everyone to get there on time. Please try to be there in good time, as late arrivals can be very disruptive, and may not be admitted.

You are expected to bring writing materials to lectures in order to make notes. Some lecturers provide handouts, but these are generally not a complete record of everything that is covered in the lecture. You should aim to develop the skills of effective note-taking to make the most of lectures.

4.2 Tutorials in Computer Science and Mathematics

Tutorials are your main opportunity for developing a deep understanding of a subject – and for sorting out misunderstandings. On average you can expect to have two or three tutorials or classes per week. Each tutor has particular methods and particular ways of organising tutorials, and will adapt your tutorials to give you the best opportunities for learning. Many tutors will base their tutorials around problem sheets issued by lecturers to accompany their lectures. Your tutor should be the first person you ask for advice on how to study, and later on how to choose optional subjects.

4.2.1 Problem sheets

Lecturers will usually suggest exercises that relate to the material in their lectures. Your attempts at these will often be taken as a framework for the tutorials or classes that accompany the course. In some cases you will find the sheets of suggested problems give you only a start on work in the subject; in others you will find that the sheet consists of a range of exercises intended to suit groups with different backgrounds and that your tutor suggests that you tackle only some of them.

Problem sheets for courses in computer science subjects are usually distributed on paper at lectures, or can be obtained from Reception at the Department of Computer Science. In addition, they are normally available from www.cs.ox.ac.uk/teaching/courses/

4.3 Tutorials in Philosophy

For tutorials in Philosophy you will be expected to bring knowledge of the readings which have been set for it (or a variant on your own initiative if some items prove really inaccessible) and almost always an essay in which you address some aspect of the topic covered by the readings.

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. As your reading progresses, think of 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 can assume that your tutor knows what is in the set reading, and is not interested in a simple re-hash of that. But they 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 online Oxford English Dictionary (accessible on the Oxford University website), also a thesaurus, and a grammar such as Fowler's Modern English Usage.

4.4 Private Study

The main difference you will find between school and university work is that at university you will be expected to do much more private study on your own.

As well as lectures and tutorials, you will find that you need to read other material and to work through additional problems to fully master the course material. The lists of

books which accompany course synopses are a good place to start on further reading, and (as always) your tutor will be able to suggest further avenues of study.

It is particularly important to do exercises, both paper-and-pencil calculation and design exercises, and practical work with a computer. There is nothing which fixes and deepens understanding of material in a field like this quite like 'doing it yourself'.

You may want to have a look at Charles Batty's notes *How do Undergraduates do Mathematics?* which, as well as being relevant to any Mathematics courses you take, might help you with your Computer Science courses. It can be found on the Web at www.maths.ox.ac.uk/files/study-guide/guide.pdf

4.5 Practicals

As Practicals are an important tool in your learning here at the Department of Computer Science we have dedicated the next chapter to this topic.

4.6 Projects

For projects you will receive separate guidance in your 2nd, 3rd and 4th years. This information is also available on the Department's website.

4.7 Responsibility

This document concentrates on the *teaching* arrangements for the course, but of course the important thing is *learning*. We will provide facilities and resources to assist your learning, and do what we can to help and encourage you to learn; but the responsibility for learning is a personal one.

5 Practicals

5.1 Practical Sessions

Practical classes for courses organised by the Department of Computer Science take place in the Practicals Laboratory on level six of the Thom Building, where demonstrators will be present to assist you in overcoming any difficulties. The purpose of practical exercises for the Computer Science courses is to help you make sure you understand the application to practical programming of the theory that is taught in lectures; demonstrators at the practical classes are there to help you get the most from the sessions.

5.1.1 Timetable

Practicals usually start in week 2 of the term and there are normally four 2-hour sessions for each course during the term. During the first 2 weeks of the term you will be required to sign-up for a practical group. Most courses have 2 groups at different times in the week; you should choose the session that fits best with your timetable. Sign-up is done online using the Minerva database, you will be informed through the termly notices of how to sign up for classes and practicals. Sign up is on a first-come-first-served basis: there is a limit to the number of students in any group, which may mean you don't get your first choice of group.

There will usually be a number of exercises that you will need to complete for each course. For example, a course with two practical exercises might have a practical timetable as follows:

Weeks 2, 4 Classes for first practical exercise

Weeks 6, 8 Classes for second practical exercise

A similar pattern will be followed for each lecture course, except for lecture courses in Trinity Term which only take place in the first four weeks, and will usually have the final class in week 4.

You might also need to work on the practicals in your own time, outside the scheduled practical sessions; this will be particularly true in later years.

5.1.2 Attendance

Attendance at practical classes is compulsory if you are to get full credit for practical work in the examinations. When you attend a practical class, you will find that specific machines have been reserved for the practical, and there will be a register for you to record your presence. You are expected to attend all the classes for each practical until you have completed it.

If you are unable to attend a practical session, for example because of illness, you should inform the demonstrator in charge, if possible before each session (the course web pages will tell you who is the demonstrator in charge.)

5.2 Writing Practical Reports

Each practical requires a report to be submitted for assessment. The report should not be a major burden: it is simply to provide evidence that you have done the work properly. Practical exercises usually give specific instructions as to what should be included in the practical report. In any case the following guidelines should be followed.

In many practicals, most of the report will be in the form of a program. Of course, you are expected to follow good programming practice:

* in a multi-module program, you should include some text explaining the role of each module, and the relationship between them;
* you should include suitable comments explaining the purpose of variables and procedures;
* you should also include comments to explain any interesting algorithms you have used: writing down an invariant will often help;
* you should make the code easy to read, for example by following standard indentation conventions, and by suitable use of white space;
* you should also include some evidence that the program works, for example by including sample output or screen shots: testing is a very important programming skill, and so you should show that you have considered suitable tests.

Many practicals will include specific questions for you to answer. Make your answers concise and relevant.

If the aim of the practical is to produce some experimental results, then you should present and discuss those. Do not just include pages and pages of numbers spewed out by the program. A concise summary is better, perhaps using another program to show the results are correct (by making a graph, say).

Try to avoid reproducing large volumes of code from the practical materials or repeating program code that you have already listed in the report. If a second program has to include the same procedure definition (say), just write "Procedure Sort(x) defined as before."

You are encouraged to write up reports on practicals as you do them during the term. The demonstrators will happily look at your reports and give you advice about them at the practical sessions, and will mark them there and then. It is perfectly acceptable to have your report marked at one practical session, then do further work on the practical and submit an improved report by the deadline. Please note that you must turn up at the beginning of the session in which you wish your practical to be marked; the demonstrators will not have time and will not be willing to mark your practical if you turn up for only the latter part of the session.

You may want to produce the report using a text formatter like TeX or LaTeX, or a word processor running on your personal computer. Be careful that the time you spend in formatting the document prettily does not distract you from getting the content right. A cogent, concise, neatly hand-written report is preferred to pages of word-processed verbiage. If you do produce a typed report, please ensure that it is legible, with adequate margins and with type that is no smaller than 10 points. While

working on your practical, keep a record of the tests you performed on your program, so that you can easily copy relevant data into your report.

Do not copy any other person's practical report. You may have general discussions with other students about the practicals, but the code, test data and report must be all your own work. Please see the section on Plagiarism in Appendix A in this handbook for more details.

5.3 Signing off Practicals

In order to have the demonstrator record that you have completed the practical, you must show them that you have done the work, perhaps by demonstrating a working program. In the ordinary way of things, you will have done the work in the lab with the demonstrator's help, and he or she will be able to check quickly that you have finished. You may prepare your practical work in advance of a practical class and bring it for checking at the class, but the demonstrators will not check off your work unless you have been attending the practical classes.

You must complete the practicals for each course in the year you offer it for examination. You may not do some of the practicals for a particular lecture course in one year and some in another year.

5.4 Assessment of Practicals

When you have completed the work for a practical and the report on it, a demonstrator will check and mark your work at a practical session. The demonstrator will ask you first to show that you have done the work, leaving aside any optional parts, and will record this fact in their register, together with your attendance at practical sessions. If a practical turns out to be very long or difficult, the demonstrators (with the advice of the course lecturer) may record the practical as complete if you have done a reasonable amount of work, even if you have not finished it.

The demonstrator will also mark your report, either at the practical session if there is time, or by taking it away and returning it later. The practical report will be marked, taking into account whether you have done any optional parts, as well as the quality of your write-up, and the general difficulty of the practical exercises. As a general guide, even an incomplete report on each practical in the course gains more credit than one where some practicals are entirely missing. Extra credit is awarded for completing optional parts of practicals, but not to such an extent that it is worth spending many hours finishing every optional part.

The following scale of marks is used by the markers; the descriptions attached to each mark indicate the rough level of performance expected, but may be adjusted to take into account the degree of difficulty of the practical exercise.

S+ The student has either completed the compulsory parts of the exercise and submitted an exemplary report, or completed all parts of the exercise and submitted an adequate report.

S The student has completed the compulsory parts of the exercise and submitted an adequate report.

S- The student has completed only part of the exercise, or has submitted an inferior report.

Practicals are assessed in two ways: first, the demonstrators keep a record of who has attended the practical classes and completed each practical exercise associated with a lecture course; and second, you write a practical report that the demonstrators mark, and which you submit to the examiners before you sit the written exam.

In examinations, the marks for practicals are treated separately from those for written papers. Practical marks do not affect the class of degree that you will be awarded, provided that you achieve a pass mark. However if you fail to reach the required standard in your practicals the examiners may deem you to have failed the examination or reduce your overall classification. You need to pass this requirement in each part of the examination.

All the practical reports must be submitted to the examiners at the end of the year, using the procedure set out in the Grey Book (see section 1.1). You must submit them to the Examiners, via the Academic Administrator in the Department of Computer Science, by noon on Monday of Week 5 of Trinity Term; full details will be given nearer to that date. Note that reports should be anonymous: they should contain your candidate number, but not your name.

5.5 Late Practicals

Practicals are intended to support the lectures and tutorial work on a course, to help to impress material on your understanding, and to connect theory with practice. Accordingly, it is very much better to be doing the practicals for a lecture course at the same time as the other work on that course. Deadlines are set to help you to resist the temptation of putting off practicals.

Another advantage of doing your practicals during the scheduled classes is that the demonstrators are often able to spot problems that are affecting several people and do something about them, perhaps clarifying the instructions or providing a piece of missing information. If you do not attend the practical classes, you will not have access to this help.

Under the rules specified in the Examination Regulations, the Examiners will not take into account practical reports unless they have been "signed by a demonstrator". The demonstrators will sign the reports when they mark them.

The Examiners will give you no credit for practical work that was not submitted for marking by the deadline and signed by a demonstrator, unless there are extenuating circumstances. Likewise, the demonstrators will not mark work that is late, unless there are extenuating circumstances. If there is a good reason why you can't submit your practical on time, for example because you were ill, then you may submit your practical late through your tutor.

6 Examinations

There are three sets of University examinations which you have to pass on your route to a BA degree: Preliminary Examinations ('Prelims') at the end of your first year, and the two parts of the Final Honour School ('Finals') at the end of your second and third years. These are called the '*public examinations'*, as opposed to any '*collections*' which are tests that your College may set you from time to time to help keep you on your toes and to assess your progress. If you carry on to do a Masters degree, you will take additional public examinations in the fourth year.

6.1 Preparation

Your tutor will advise you about revision and practice. As well as any consolidation work done after the end of a term, it is usual to spend at least the second half of Trinity term revising work for that year's examinations.

In subjects that have been taught in previous years, past examination papers are good guides to the sort of examination question that you might be set. In newer subjects you will usually be offered model questions, or some other guidance on the sort of thing to expect. Past papers can be found on the Web at
www.cs.ox.ac.uk/teaching/examinations/

Also available are the *Examiners' Reports* for the past few years, which contain – amongst other things – the examiners' admissions about which questions turned out to be very difficult or had other problems. A word of caution: the syllabus for examinations changes over time, and is certainly not determined by what has appeared in past papers. Your tutor will be able to give you advice on how relevant particular past papers are.

College collections will often be constructed of questions from past papers. Many candidates and tutors choose to keep the most recent past paper in a subject for use as an unseen practice examination at a late stage of revision.

6.2 Entering

Your College arranges for you to be entered for the public examinations, which involves the submission of a form from the College to the University detailing all of the papers which you are sitting. A few weeks before the examinations begin a timetable will be issued and sent to your College showing where and when each of the written papers will happen. Your College will pass on to you your timetable together with a randomly allocated *candidate number* which you will use to identify your scripts, instead of your name and College, so that they can be marked anonymously.

6.3 Notices to Candidates

Before your examination you will receive one or more letters of *notice to candidates* from the examiners which will tell you of any details of the examination procedure that are different from the usual. Notices to candidates will be sent to you by the Academic Admin Team. These notices contain important information about your examinations and should be read very carefully. If you have any questions then please ask your Tutor; you should not contact the examiners directly.

6.4 Procedure for Written Examinations

Your Preliminary Examinations are likely to be held at Ewert House in Summertown. You can expect your second and third year examinations to be held in the Examinations Schools, on the High Street. Different papers happen in different rooms around the building, as detailed in the entrance hall.

It really is the case that you wear full academic dress (sub fusc, gown and cap) to attend public examinations, and you must bring your University card with you.

You should make every effort to be on time for examinations. If you are not there at the start of the examination, attempts will be made to contact your College to find out why not. Generally speaking there is no insurmountable difficulty if you get there in the first half hour, although you will have less time to do the examination. For this reason, nobody may leave an examination until half an hour after it starts.

Desks are identified by your name and college, with the desks in alphabetical order of names, but you will need to know your candidate number so that you can write this (and *not* your name) on your script when you hand it in. For each paper that you sit you will be given a cover sheet on which you identify yourself by your candidate number, and the paper by its number and title.

The question paper will be on your desk when you go in to the examination. You should check that it is the paper that you have entered for, and you should carefully read the instructions on the cover, but you may not open it until told to do so. Read the wording of each question carefully, and make sure that you have not missed out any parts.

You will be provided with booklets of ruled A4 paper in which to write your answers. The regulations in the Grey Book require that you write in ink, rather than pencil, although you may use pencil for any graphs and drawings. It is a good idea to use blue or black ink, rather than something more unusual, in the interests of anonymous marking. Please start each answer on a new page. (This makes it much easier for the marker.) If you do start part way through a sheet, do not worry: just make a clear note of the fact so that the examiners can be careful not to be confused.

You must write legibly: if nothing else it will avoid annoying the marker; but there is a provision for illegible scripts to be typed *at the expense of the candidate*!

You will be given instructions at the examination about handing in your script. It is your responsibility to do this: anything left on your desk is liable to be thrown away by the person clearing the room. There will be treasury tags available for you to use to attach booklets together. The rubric on the paper will tell you whether to bind everything in one bundle, or whether to hand in answers to different parts of the paper with separate cover sheets. If you do not attempt any questions from one part of the paper, you should still hand in a cover sheet for that part, so that the examiners can check that all parts of all papers are accounted for.

6.5 Composition of Preliminary Examination Papers

On Preliminary Examination papers for Computer Science and Mathematics, each question is marked out of 20. Each question will contain some parts of a straightforward nature, and some parts requiring more advanced understanding or an unseen application of techniques or theory on the syllabus. The examination paper will show the marks available for each part.

6.5.1 Computer Science

In the Preliminary Examinations for Computer Science you will take the following four papers:

CS1 Functional Programming and Design & Analysis of Algorithms
CS2 Imperative Programming
CS3 Discrete Mathematics, Continuous Mathematics and Probability
CS4 Digital Systems, Linear Algebra and Introduction to Formal Proof

Papers CS1 and CS2 will each be of 3 hours' duration and will contain eight questions (four on each constituent course); you should answer five questions, with no more than three questions from either half of the paper.

CS3 and CS4 will each be of 3 hours' duration and will contain nine questions (three on each constituent course); you should answer five questions, with no more than two questions from any part of the paper.

6.5.2 Mathematics & Computer Science

In the Preliminary Examinations for Maths & Computer Science you will take five papers; CS1 and CS2 as described above, and also

M1 Algebra
M2 Analysis
MCS3 Continuous Mathematics and Probability

Paper MCS3 will be of 2.5 hours' duration and will contain six questions (three on each constituent course); you should answer four questions. Paper M1 will be of 2.5 hours' duration and will contain seven questions (four on Part A and three on Part B); you should answer five questions (three from Part A and two from Part B).

Paper M2 will be of 2.5 hours' duration and will contain seven questions (three on Part A, three on Part B and one on Part C); you should answer five questions (two from Part A, two from Part B and one from Part C).

6.5.3 Computer Science and Philosophy

In Preliminary Examinations, Computer Science & Philosophy candidates will take five papers, CS1 and CS2 as described above, and also

CSP3 Discrete Mathematics and Probability
P1 Introduction to Philosophy

P2 Elements of Deductive Logic

Paper CSP3 will be of 2.5 hours' duration and will contain six questions (three on each constituent course); you should answer four questions.

Paper P1 will be of 3 hours' duration and will contain six questions on Part A and six questions on Part B. You should answer four questions with at least one from each Part.

Paper P2 will be of 3 hours' duration and will typically contain seven or eight questions. You should answer four questions.

6.6 Marking and Classification

The way in which the Examiners administer the examinations is described in the Examination Conventions which can be found at

www.cs.ox.ac.uk/teaching/examconventions.html

For all exams, the examiners base their assessment of your performance in the examination on a scaled mark out of 100 assigned for each paper; the scaling takes into account the likelihood that some papers in the examination are more difficult than others. The examiners have the discretion of taking medical certificates or other evidence into account when arriving at standardised marks for each paper.

The scaled marks for each paper are combined to obtain an overall mark out of 100. A classification is then produced as follows:

- 70 marks for a Distinction
- 40 marks for a Pass

You are required to achieve a 'Pass' in each paper (a mark of 40 or higher) to pass the Preliminary Examination.

6.7 Finals Examinations

Details about Finals Examinations can be found in the Supplement to this Handbook.

7 The University and you

7.1 The Faculty of Computer Science

The central administration of the University is devolved to a number of *divisions*, amongst them the Division of Mathematical, Physical and Life Sciences (MPLS), which is in practice the ultimate authority that controls your degree course.

Within the MPLS Division, the Faculty of Computer Science controls the development of the subject in the University. The Faculty meets once a term to discuss matters including changes to the composition of the degree, and to consider reports on the previous year's teaching and examinations.

7.1.1 The Teaching Committee

Detailed administration of the Computer Science courses is conducted by the Teaching Committee of the Department of Computer Science which is chaired by the Director of Teaching. The Teaching Committee of the Mathematics Department is also represented on this committee.

7.1.2 Joint Consultative Committee for Undergraduates (JCCU)

We have a formal structure for undergraduate consultation and representation in Computer Science. The JCCU is a committee which is elected from the student body with a representative from each year of each degree within Computer Science. There is an open meeting in week 3 in which the Chair of this committee will invite students to nominate or volunteer for a position on the committee. The committee meets in week 4 of each term to discuss any issues raised by student representatives.

In addition 1 or 2 members of the committee will be invited to attend the Faculty meeting in week 6 of each term to raise any issues there, as appropriate.

7.1.3 The Mathematics Undergraduates Representative Committee (MURC)

The Mathematics Undergraduates Representative Committee (MURC) is organised by undergraduates on the various Mathematics and Computer Science degrees. It has representatives at each of the colleges, and acts amongst other things as a formal channel for bringing feedback directly to the central administration of these subjects.

7.2 Course Feedback

Your views on how well your course works are an important part of the mechanism for determining how we can improve it for the future, so there are many opportunities for you to comment on the course.

Informally, you can make your views known directly to the academic staff who teach you in lectures, classes, and tutorials. In particular, you might like to make comments to your College Tutor, the Chair of the Faculty or the Director of Teaching. All academic staff will encourage you to make your views known to them and will give

you ample opportunity to comment on syllabus content and any other issues about the delivery of the course.

7.2.1 Course Review Committee

Formally, feedback for courses is given via online course questionnaires. You will be invited, by email to complete an online survey on all aspects (lectures, classes and practicals) of the courses you have attended each term. The feedback will be open from week 4 Even if you have decided not to continue on the course, you are welcome to give feedback and let us know why. It is important that we stress how valued student feedback is and what a large part it plays in the quality assurance process.

These questionnaires are considered termly by the Course Review Committee in the Department of Computer Science and the comments and an analysis of the statistics on each course are sent to the lecturer of that course.

The Course Review Committee reviews all courses after they have run, in particular looking at feedback from questionnaires, to consider ways of improving the teaching. It also looks at proposed changes to the syllabus and synopsis of courses.

7.3 The Proctors

With luck (and good judgement on your part) you will not have much to do with the Proctors. The Proctors (two of them) and the Assessor (one of them) are senior members of colleges, elected for a year at a time by their colleges in turn to keep the University in line. They have many administrative duties, but some in particular may bring them into contact with undergraduates.

The Proctors are responsible for ensuring that all examinations are conducted properly, for implementing student discipline at University level, for registering student clubs and societies, and for investigating complaints. In this latter capacity they may summon any member of the University to appear before them. The Assessor has special responsibilities for student welfare. Based in a separate section of the University Offices in Wellington Square, the Proctors and Assessor are supported by the Clerk to the Proctors and a small secretarial staff, together with (for some of their disciplinary and ceremonial functions) the University Marshal and University Police.

7.3.1 Harassment

By University legislation, it is an offence for any senior or junior member of the University to harass any other member or any person for whom the University is responsible. Sexual and racial harassment are among the forms of harassment covered by this rule, but it also covers any form of intentional or unintentional teasing, embarrassment or bullying which causes you inconvenience or unhappiness, particularly if persistent.

The University has a code of practice for dealing with any such cases which may arise and this appears in the Proctors' and Assessor's Memorandum. Further information can also be found at

www.admin.ox.ac.uk/eop/harassmentadvice/

The Harassment Advisors for the Department of Computer Science are:
Dr S. Holdom (Room 107, OUCL) Tel. 73863,
Professor L. Ong (Room 340, OUCL) Tel. 83522.

In addition, the Proctors have set up a panel of people with relevant expertise to act as advisers in particular cases. These arrangements complement the procedures which may exist in individual colleges.

[A] Plagiarism

The University's code of conduct concerning academic integrity is set out on the website at: http://www.admin.ox.ac.uk/ps/staff/codes/air.shtm

The following information and advice is of relevance and use to students for all their academic work, e.g. mini projects, third and fourth year projects, as well as all class and practical work.

Since plagiarism is treated as a serious breach of academic integrity, it is important that you ensure you that you understand fully what is meant by the term "plagiarism", how to avoid it in your writing and the potential consequences of either deliberate or inadvertent plagiarism.

We recommend that you complete this online plagiarism course before embarking on your project:

https://weblearn.ox.ac.uk/portal/hierarchy/skills/generic

At the end of the course there is a quiz to test your knowledge; if successful you can print out a certificate for your records. The course also provides an accessible source of information and advice about plagiarism. You should use it in conjunction with the advice on these pages.

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.

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. For guidance on how to use the Internet appropriately in your scholarly work, try the 'Internet Detective' online tutorial: http://www.vtstutorials.ac.uk/detective/

- 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). For more guidance on how to reference correctly, see http://www.cs.ox.ac.uk/files/3161/Referencing.pdf

- 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.

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.

Why should you avoid plagiarism?

Students' work is expected to meet high academic standards and will be scrutinised carefully. The University must ensure that these standards and academic integrity are upheld. Plagiarism at this level is a serious breach of academic integrity and the consequences can be severe. In some cases a student may be expelled, or they may be stripped of their degree if their work is later discovered to contain plagiarised material. Some academics' careers have been ruined by the discovery of plagiarism in decades-old published work.

Far from being simply a disciplinary matter, plagiarism undermines the central tenets of scholarly discourse. Knowledge develops via a cumulative process as a result of years of research, innovation and debate. 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. It is important to recognise that academic texts are multi-voiced, constructed from references to other texts; it is your responsibility as a writer to make it clear at all times whose 'voice' is speaking, whether your own or one of your sources'. This requirement for transparency of source use means that you must cite adequately, make it clear when you are quoting or paraphrasing, and establish the relationship between your source and your own text.

Citation

Giving credit to the authors of the ideas and interpretations you cite not only accords recognition to their labours, but also provides a solid theoretical basis for your own argument. Your ideas will gain credence if they are supported by the work of respected writers. Transparent source use allows you to situate your work within the debates in your field, and to demonstrate the ways in which your work is original. It also gives your reader the opportunity to pursue a topic further, or to check the validity of your interpretations.

When writing you should consider the ways in which your work depends upon or develops from other research, then signal this with appropriate citation. Make clear your reasons for citing a source. When paraphrasing an idea or interpretation you must ensure that your writing is not too closely derived from the original, and you must also acknowledge the original author.

You may wish to employ software which keeps track of your sources and automatically formats the footnotes and bibliography (e.g. EndNote, Reference Manager, ProCite). It is important to be meticulous when taking notes: include full citation details for all the sources you consult and remember to record relevant page numbers. It is far too time-consuming to go back to your books to find page numbers or citation details later. Citation practice varies but, depending on the type of text cited (book, chapter in an edited volume, conference paper, journal article, e-print, etc.), the elements of a reference include: author; title of the book or article; title of the journal or other work; name of the conference; place of publication; date of publication; page numbers; URL; date accessed. The conventions for citing web resources vary between disciplines. You should note as many essential items of information as possible, such as author, title, publisher, dates of publication and last revision, URL, and date of last access. When using e-print archives you should bear in mind that many contain articles which have not yet been submitted for peer review. It is good practice to review the later, published versions for important changes before submitting your dissertation.

Patchwriting

Inexperienced writers, particularly those who are not native speakers of English, often develop their writing technique via a process known as "patchwriting". If they lack the requisite skills of academic writing or self-expression, they may copy or heavily paraphrase their source material. Where the derivation is not made clear, this is plagiarism. However, it is recognised that many honest students employ mimicry and borrowed language as they learn to write in the academic style, and that patchwriting can be seen as a developmental stage. As students gain more experience at writing they must develop an independent voice and cease to rely on imitation. If work containing unattributed paraphrase is submitted for assessment, it will be treated as plagiarism regardless of the author's intentions.

Cultural differences

Students who experience difficulties adapting to the culture of academic study at Oxford should not delay in seeking out sources of support and guidance. If you are not a native English speaker, you should take full advantage of the resources at the Language Centre. Do not hesitate to approach your tutor to discuss your needs. Develop your academic writing skills through practice and ask for detailed feedback on your work. Ensure that you follow scrupulously the source use and referencing conventions of your discipline, even if they vary from those you have used before. You should take the online plagiarism course as early as possible to ensure that you understand the issues involved. This web site and the sites it links to will also provide useful resources. If you have specific difficulties or questions, you should always ask for advice.

Disciplinary process

Plagiarism in the work you submit for assessment is considered to be a breach of the disciplinary regulations regarding conduct in examinations. Full details of the disciplinary process are available on the university web site.

A last word

Not only is plagiarism unethical, it also seriously undermines the value of your work and of any degree you may obtain. By extension, it devalues the work of your colleagues and the standards of your institution. It can also have far-reaching consequences, the effects of which may be felt many years hence.

However, you should not avoid plagiarism for fear of disciplinary consequences, but because you aspire to produce work of the highest quality. Once you have grasped the principles of source use and citation, you should find it relatively straightforward to steer clear of plagiarism. Moreover, you will reap the additional benefits of improvements to both the lucidity and quality of your writing. It is important to appreciate that mastery of the techniques of academic writing is not merely a practical skill, but one that lends both credibility and authority to your work, and demonstrates your commitment to the principle of intellectual honesty in scholarship.

A guide to citing and referencing for students

This can be found at:

www.cs.ox.ac.uk/teaching/handbooks.html

[B] Applying for Computer Resources

The Department of Computer Science network connects around 70 servers, several hundred workstations (mostly running Linux, but also dual boot with Windows XP), various supercomputers, and many other machines. Facilities elsewhere are accessed via fast connections to the Internet. Details of the facilities available on the network may be obtained from any of the Department's Computing Officers or on the web at **https://wiki.cs.ox.ac.uk/wiki/support**

Returning the Application Form

To use the computing facilities on the Department's own network you should complete the Application for Computer Resources form included in your induction pack, and bring it to one of the practical classes arranged for your course during first week. You should hand it to one of the Departmental Lecturers in exchange for an envelope containing details of your username and password.

If this is not possible, please consult the Operations Manager, Craig Tranfield, Room 148 (Email: craig.tranfield@cs.ox.ac.uk).

The use of the Department's facilities based in the Thom Building is governed by the rules of the Department of Engineering Science (as they apply to the Thom Building) and by the rules of the Department of Computer Science (as they apply to use of practical facilities). You must comply with any such rules which are brought to your attention. The University has issued a policy on data protection and computer misuse which you should read and take note of, copy attached. **By signing the application form you are agreeing that you will not misuse any of the resources.**

The University has formal regulations and a code of conduct which govern the use and misuse of Computers and Networks. In addition to this, members of the Department of Computer Science are expected as a matter of honour to respect the privacy of other users of the networks to which they have access, and to refrain from actions which will cause others' work to be damaged or delayed.

The Data Protection Act

The Data Protection Act 1998 defines "personal data" as data which "relate to a living individual who can be identified- (a) from those data, or (b) from those data and other information which is in the possession of, or is likely to come into the possession of, the data controller, and includes any expression of opinion about the individual and any indication of the intentions of the data controller or any other person in respect of the individual;"

The University has issued a statement on its Data Protection Policy, and you are requested to read and take note of this; a copy is appended. By signing the application form you are agreeing that you will not misuse personal data. If you are in any doubt about this, or other aspects of data protection, you should contact the support staff.

Declaration

This is a copy of the declaration which each student who requires computing facilities is asked by the Department of Computer Science to sign

> I accept that all software systems and software packages used by me are to be regarded as covered by software licence agreement, with which I agree to abide, which unless specifically stating otherwise will prohibit me from making copies of the software or transferring copies of the software to anyone else, other than for security purposes, or from using the software or any of its components as the basis of a commercial product or in any other way for commercial gain. I indemnify the Chancellor, Masters and Scholars of the University of Oxford, and the Oxford University Department of Computer Science, for any liability resulting from my breach of any such software licence agreement.
>
> I will not use personal data as defined by the Data Protection Act on computing facilities made available to me in respect of this application other than in the course of my work as per the University's registration. I accept that the Oxford University Department of Computer Science reserve the right to examine material on or connected to any of their facilities when it becomes necessary for the proper conduct of those facilities or to meet legal requirements and to dispose of any material associated with this application for access to its resources upon termination or expiry of that authorisation.
>
> I agree to abide by any code of conduct relating to the systems I use and the University policy on data protection and computer misuse. In particular, I will not (by any wilful or deliberate act) jeopardise or corrupt, or attempt to jeopardise or corrupt, the integrity of the computing equipment, its system programs or other stored information, nor act in any way which leads to or could be expected to lead to the disruption of the approved work of other authorised users.

Other Notes

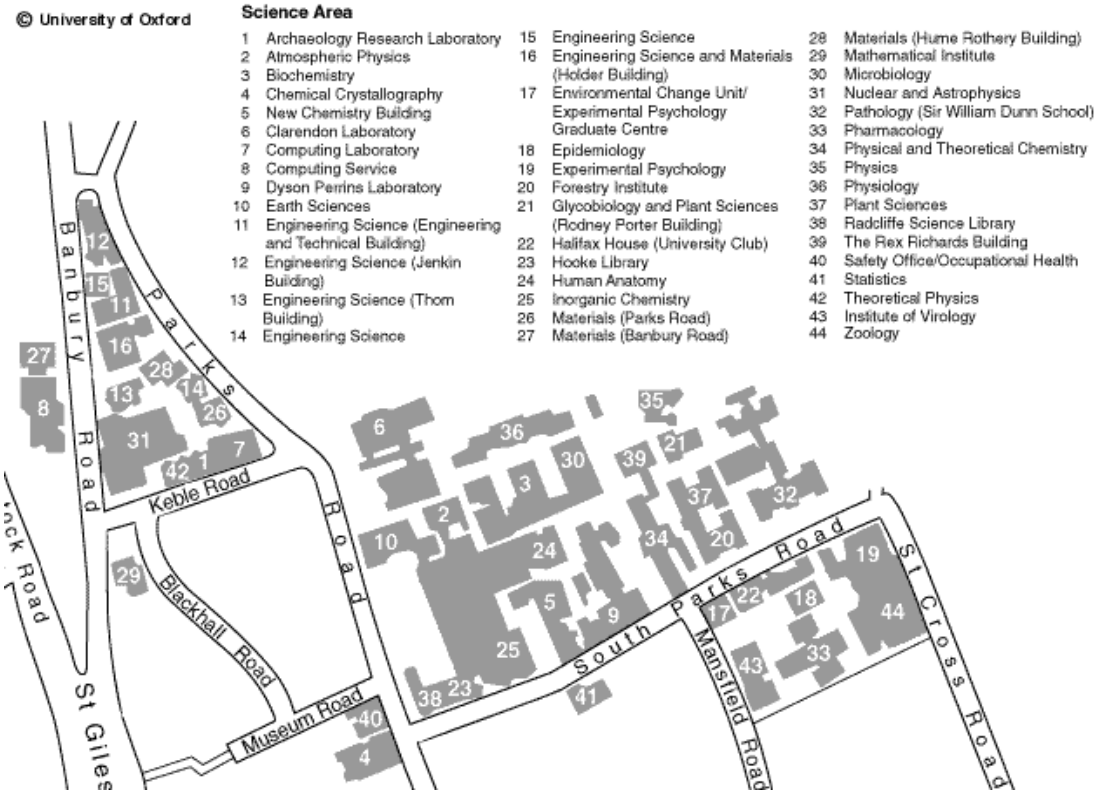
These notes are to help you to interpret the Application for Computer Resources form. If you need any additional help or information, please contact the support staff at the Department of Computer Science, Wolfson Building, Parks Road, *support@cs.ox.ac.uk*

Nobody may use the resources of the Department of Computer Science without signing an application form, nor continue to do so once their account has expired.
Queries about the conditions imposed by particular software licence agreements should be addressed to the support staff.

Referenced documents are available at or based upon:

http://www.ict.ox.ac.uk/oxford/rules/
(Oxford University Computer Usage Rules and Etiquette)
http://www.hmso.gov.uk/acts/acts1998/19980029.htm
(Data Protection Act 1998)

[C] Map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Science Area
1 Archaeology Research Laboratory
2 Atmospheric Physics
3 Biochemistry
4 Chemical Crystallography
5 New Chemistry Building
6 Clarendon Laboratory
7 Computing Laboratory
8 Computing Service
9 Dyson Perrins Laboratory
10 Earth Sciences
11 Engineering Science (Engineering and Technical Building)
12 Engineering Science (Jenkin Building)
13 Engineering Science (Thom Building)
14 Engineering Science
15 Engineering Science
16 Engineering Science and Materials (Holder Building)
17 Environmental Change Unit/ Experimental Psychology Graduate Centre
18 Epidemiology
19 Experimental Psychology
20 Forestry Institute
21 Glycobiology and Plant Sciences (Rodney Porter Building)
22 Halifax House (University Club)
23 Hooke Library
24 Human Anatomy
25 Inorganic Chemistry
26 Materials (Parks Road)
27 Materials (Banbury Road)
28 Materials (Hume Rothery Building)
29 Mathematical Institute
30 Microbiology
31 Nuclear and Astrophysics
32 Pathology (Sir William Dunn School)
33 Pharmacology
34 Physical and Theoretical Chemistry
35 Physics
36 Physiology
37 Plant Sciences
38 Radcliffe Science Library
39 The Rex Richards Building
40 Safety Office/Occupational Health
41 Statistics
42 Theoretical Physics
43 Institute of Virology
44 Zoology
Banbury Road
Parks Road
Keble Road
Blackhall Road
Museum Road
St Giles
South Parks Road
Mansfield Road
St Cross Road