DEPARTMENT OF
COMPUTER
SCIENCE

MSc ADVANCED COMPUTER SCIENCE COURSE HANDBOOK

For students entering the course in 2023

2023

Version 1

Welcome!

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, visitors and students who have been attracted to Oxford from all over the world.

The Department of Computer Science's reputation ranges from its fundamental research into computing methods and languages through to practical solution of engineering and scientific problems on the latest highly parallel computer architectures. Our wide-ranging collaborative work with leading industries in this country has been twice recognised by the rare honour of a Queen's Award for Technological Achievement.

During your study at Oxford, we hope to share with you some of the understanding which we have gained, both by our research into basic theory and by industrial collaboration. We hope too that you will be able to share with us - and with each other - our enthusiasm for the subject, and will enjoy developing your talents in this field. The development of computing at Oxford has been heavily supported by donations and sponsorship from our industrial partners. We have devoted our best efforts to the design of the courses you will take and to the perfection of our lecturing and teaching skills; when you leave, we are confident that you will have a sound basis for a productive and rewarding career.

This handbook aims to give you a handy reference, and provide more specific information about your course, but it cannot tell you all you need to know.

Do not be afraid to ask for further information or advice.

Contents

Disclaimer

This Course Handbook applies to MSc in Advanced Computer Science students starting the course in Michaelmas Term 2023. The information in this handbook may be different for students starting the course in other years.

The information here is designed to be general and relevant throughout your time at Oxford; further information on courses, practicals and projects will be given to you and/or made available on our web pages at appropriate times.

The Examination Regulations relating to this course will be available online at

MSc in Advanced Computer Science

If there is a conflict between information in this handbook and the Examination Regulations then you should follow the Examination Regulations. If you have any concerns please contact the graduate studies team at graduate.studies@cs.ox.ac.uk.

The information in this handbook is accurate as at October 2023, however it may be necessary for changes to be made in certain circumstances, as explained at www.graduate.ox.ac.uk/coursechanges webpage. If such changes are made the department will publish a new version of this handbook together with a list of the changes and students will be informed.

Version	Action	Date
Version 1.0	Published start of MT23	

1 MSc in Advanced Computer Science

1.1 Aims

The MSc in Advanced Computer Science at Oxford has been designed to teach a range of advanced topics and a carefully selected core of foundational subjects to graduates of computer science and other numerate disciplines.

The course aims:

- To provide a challenging and supportive learning environment that encourages high quality students to reach their full potential, personally and academically;
- To provide the foundation for a professional career in computing-based industries;
- To enhance the skills of a professional who is already working in one of these industries;
- To provide a foundation for research into the theory and computing;
- To present knowledge, experience, reasoning methods and design and implementation techniques which are robust and forward-looking.

Entrants to the course come from a variety of backgrounds. Recent graduates in Computer Science will want to supplement their knowledge with the kind of sound mathematical basis which is not always found in undergraduate courses. Graduates in Mathematics will want to apply their training in the context of a rigorous application of the fundamental techniques of Computer Science.

Teaching for each topic is organised into formal lectures supported by problem sheets and some topics also have practicals for individual study. The Recommended Patterns of Teaching in Section 9 of this handbook confirms the number of lectures and classes for each course. It also confirms where a course has practicals.

Feedback (to students, advisors, the Course Director and the Head of Academic Administration) is initially given through graded classwork and supervised practical sessions. Problem sheets and practical work are designed to involve a mix of creative activity and selection of appropriate knowledge to apply to particular problems. Students can build on their understanding and develop their communication skills during class discussions of the problems set.

MSc students will develop a knowledge and understanding of a formal disciplined approach to Computer Science; a range of relevant concepts, tools and techniques; and the principles underpinning these techniques and the ability to apply them in novel situations.

1.2 Sources of information

We hope that this handbook is a comprehensive source of information about your programme. However, you may also wish to check the Examination Regulations for the degree, the

Department of Computer Science website, the University Student Handbook and the Oxford Students website. You should also speak to your College as each college has its own set of regulations and processes.

1.3 Finding your way around

The University of Oxford can be quite a confusing place, with a lot of words and phrases that may be new to you. There is a comprehensive Glossary on the University website, and we have supplemented this with an explanation of terms commonly used in the Department of Computer Science: https://courses.cs.ox.ac.uk/mod/glossary/view.php?id=1359

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 lectures, classes, and practicals in the Department of Computer Science, which is part of the University. The University and its departments enable you to study for a degree, examine your competence at the end of that study, and award you a degree.

Your College provides you with a home, feeds you, and guides your study. Your college has a key role in providing pastoral support to you. However, if you have any questions or concerns during your studies you can speak to your college advisor, your departmental academic advisor, the college office or the department's Academic Administration team. If you are unsure who to speak to, the Academic Administration team are happy to help!

1.4 Length of Course

This is a full-time one-year course. Students are expected to work for about 44 to 46 weeks, but outside normal term time they might be working away from Oxford.

Typically a student would attend between 8 and 12 hours of lectures, 4-6 hours of practicals and 3 hours of classes a week. Please note that students are responsible for their own academic progress, and will be expected to complete 15-20 hours of private study each week. Students will be working during the vacation on their assignments and from April until the end of August students will be working on their project and dissertation.

Please note that this is a full-time course and you will need to be in Oxford for most of the year. This means that you should not take on any other commitments during the year, e.g. it will not be possible for you to fit in any sort of employment. Also, before making any holiday arrangements please bear in mind that you will have to complete written assignments and possibly attend one-week options outside of normal term. You should seek advice from your academic advisor or the Graduate Studies Assistant (PGT) before booking holidays.

1.5 Course Selection

We hope that you will make a suitable selection of courses from among the many interesting topics that we offer. The choice should be related to the area of your subsequent dissertation but should not overlap with courses you followed in your undergraduate degree. Students typically study three courses per term. Those intending to study four courses should exercise caution due to the intense workload this can involve.

Students are allowed to take examinations in a maximum of four courses per term. This means that: students can submit a maximum of four mini-projects at the end of Michaelmas Term; and a maximum of four mini-projects at the end of Hilary Term; and can sit a maximum of four examinations during Trinity Term.

In addition, students may take no more than two courses from the following list:

Combinatorial Optimisation
Computer Aided Formal Verification
Computer Security
Lambda Calculus & Types
Machine Learning
Principles of Programming Languages
Quantum Information

You are required to attain an average of at least 50 (pass) across your best six courses.

A number of courses recommend pre-requisites: please check the relevant webpages. If you are in any doubt, consult the course lecturer or your academic advisor.

It is a good idea to start discussing choices with your academic advisor as soon as possible during your first week at Oxford.

1.6 Key Contacts

The academic staff you will encounter are likely to be in three kinds of roles: there are University Lecturers and other university staff who are employed to give lectures, to organise the degree courses and to examine; there are departmental staff who are employed to run practical work and organise laboratory work and classes; and there are there are college tutors and college lecturers who are employed by your College to teach and guide students. 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 an advisor in College, as a lecturer in the Department of Computer Science, and perhaps as an examiner when it comes to your University Examinations.

For postgraduates, you will have a college advisor, who can be contacted if any issues arise. You will also have an academic advisor in the department who will be responsible for guiding your academic studies.

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 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 or pop into their office at the Department to see them in person.

You can find details of the team, their responsibilities and contact information on the Intranet here. We outline the key contacts below:

Director of MSc in Advanced Computer Science:
Peter Minary (Michaelmas Term)
Michael Benedikt (Hilary and Trinity Term)

Graduate Studies Assistant (PGT):
Judith English

Deputy Head of Academic Administration:
Caroline Davies

Head of Academic Administration and Disability Coordinator:
Rachel Breward

For all enquiries, please email graduate.studies@cs.ox.ac.uk

Timetables

The timetable for each term can be found on our web pages at:
www.cs.ox.ac.uk/teaching/timetables

1.7 The Department of Computer Science

The Department of Computer Science is spread over several buildings. The biggest one is the Wolfson Building, which houses lecture rooms, classrooms and computing labs. Some lectures and classes will take place in the Robert Hooke Building.

The Head of the Department of Computer Science in 2023/24 is Prof. Leslie Goldberg. For names and contact details of first aiders or anything else related to safety in the Department, please see the Department's intranet on Health and Safety.

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. The building loops around a central courtyard. 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 closes at 17:00 Monday to Friday. Graduate students can access the building outside of these times using their University card and pin number.

The building has two lecture theatres and one seminar room: they can be reached through the door to the right of the main Parks Road entrance. Lecture Theatre A and the seminar room (051) are on the basement floor and Lecture Theatre B is on the ground floor.

Graduate students can enter teaching rooms through the main building. The Graduate Common Room is on the ground floor, by the Keble Road entrance. You will also find facilities around the building to make hot drinks. Please do not take food or drinks other than colourless liquids into lecture rooms, seminar rooms, computer rooms, or laboratories. When you bring liquids into those spaces, please make sure that you do so strictly in spill-proof and leak-proof bottles in order to avoid disturbing others or damaging the facilities. Please also remember to leave the space as clean as you found it, disposing of any rubbish in the bins available throughout the Department.

The Robert Hooke building

The department has four seminar rooms in the Robert Hooke building, the Richard Bird Room, the Christopher Strachey room, the Tony Hoare Room and Room 114. 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 north of the University Museum of Natural History. The building can be accessed using your University card.

Library

The Department of Computer Science Library contains books, monographic series, journals, technical reports and past theses covering the main research interests of the Department. It is principally for use by graduate students and staff, and is situated in room 240 on Level 2 of the building.

Library Opening hours: The library is open 24/7. Library staff are normally available from 09:00-13.00 and 14.00-16.30 Monday to Friday.

Registration: you will be pre-registered but you must confirm your registration by bringing your University Card to the library before you begin to borrow.

The Catalogue: books and journals are listed on SOLO (the University-wide online catalogue).

Borrowing: members are limited to 12 books at any one time. Books may be borrowed for 3 weeks at a time with possibility of renewal for a further three periods of three weeks unless a book has been recalled by another reader. Books are borrowed using the automated self-issue system. Please ask if you have problems using the machine.

Short-loan Collection: books in the short loan collection may be borrowed for 6 days with possibility of renewal for a further six periods of 6 days. They are kept in locked bookcases and can only be borrowed when the library is manned or by email request.

Other services: The library has a compact study area with a dedicated terminal for SOLO catalogue searches and a computer for general internet searches. The library also contains copies of the MSc and D.Phil. theses submitted by students attached to the Department.

Contact the Library: Aza Ballard-Whyte (Librarian), telephone 73837, email library@cs.ox.ac.uk

1.8 Computer Science Systems

The department's teaching network comprises two teaching labs with PCs running Linux. The largest teaching lab (T6.05) is located on level 6 of the Thom Building and contains 48 desktop PCs for students. The second lab (379) is located on level 3 of the Wolfson building and contains 35 desktop PCs.

In addition to the desktop computers in the teaching labs, there are remote access facilities available to you. You can use these facilities to do practical work using your computer while you are not in one of the teaching labs. You have some instructions on how to set up the remote access in your computer available.

You will have prior knowledge of using computers; however, you may not have specific experience with the type of systems available at Oxford. Therefore, we offer 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 sessions in the Practicals Laboratory throughout the term. These sessions guarantee students exclusive access to the computing facilities they require to complete their work. Demonstrators are present at each session so that you can obtain help with the practicals as you are doing the work.

Although computers are often booked for practical sessions, 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 regular practical times, or to take the opportunity to learn more about the facilities available.

You are strongly advised to bring your own computer. In addition, you will be able to use the Department's computing facilities. 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, or by using the remote access facilities available to you.

Your College IT officer will be able to advise you on remote access to the Department's facilities from your own computer, or the college's own computers.

If you decided to bring your own portable equipment to the Department, please note that you will not be allowed to plug into the wired ethernet network in the Practicals Laboratory in the Thom Lab or the Department. Wireless connection, via Eduroam, is available in these areas.

The computers available in the computer rooms must always remain connected. If you wish to connect your laptop to the existing equipment, please do so only if you can reconnect everything back to how it was, and please remember to do so before leaving the room. Otherwise, other students using the labs will be disrupted if the equipment has been disconnected.

Please do not switch off the computers that are in the computer labs.
Those computers are configured to go to sleep after an idle period automatically, so please bear that in mind in case you need to run any long-running experiments.

Any personal electronic devices brought to the Department are subject to policies on electrical equipment. All staff, students, and visitors are co-responsible to ensure that they are electrically safe. In case of questions about electrical safety, please contact technicians@cs.ox.ac.uk.

In addition, there are three key systems in the Department that students use regularly. We provide more information on each below.

1.8.1 Minerva

Each lecture course will have associated exercises and, in most cases, practical exercises as well. You are expected to attend the classes and any practical sessions for the courses you wish to follow. You will use Minerva to sign up for classes and practical groups.

Minerva lists classes and practicals groups taking place for each taught course each term. The classes list the day, time and location of the class as well as the class tutor's name and email address. Minerva also lists the process for submitting work for marking.

Minerva is open from **1pm on Monday of Week 1** of each term and closes at **5pm on Friday of Week 2**. During this time, you will be able to sign up for classes and practicals and can move yourself between courses. After Minerva closes you are no longer able to make changes to your record and these must be requested by emailing the Academic Admin team.

1.8.2 Moodle

Moodle is the Department's Virtual Learning Environment. You will find course materials here, including lecture slides and problem sheets.

1.8.3 Panopto

Recordings of lectures will be available on Panopto shortly after these have taken place.

1.9 Assessment and feedback

There will be opportunities in both classes and practical sessions to receive informal feedback on your work by means of discussion with tutors or demonstrators.

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.

Formative assessment, defined as having "a developmental purpose, designed to help learners learn more effectively by giving them feedback on their performance and how it can be improved and/or maintained" (Quality Assurance Agency, 2018, p.1) is achieved in the MSc in Advanced Computer Science by means of classwork and practical exercises (see 2 below). The marks you

receive on your class and practical work will give you and your advisor regular feedback on your progress, help you consolidate your understanding, and identify any areas of weakness.

Where a problem is identified, additional tuition may be provided either by the advisor or, with the Course Director's approval, by the class tutor.

Summative assessment, defined as being used to "Used to indicate the extent of a learner's success in meeting the assessment criteria to gauge the intended learning outcomes of a module or course" (Quality Assurance Agency, 2018, p.1), of the taught part of the course is through a combination of take-home assignments or sit-down examinations (see 3 below), where appropriate, reports on practical work, and the dissertation (see 4 below).

You will receive a University Standardised Mark (USM) for each of the take-home assignments or sit-down examinations you complete, and for the dissertation. The criteria for USMs are published in the Examination Conventions: https://www.cs.ox.ac.uk/teaching/examinations/

You are required to attain an average of at least 50 (pass) across your best six courses.

You are welcome to consult past Examiners' Reports to understand past cohorts' performances on individual assignments and examinations:
https://www.cs.ox.ac.uk/teaching/internal/examinersreports/MSCinCS.html

Candidates must not contact the assessor with queries regarding feedback. If you have a query or complaint about the conduct of your examination, it must be raised with the Senior Tutor or equivalent at your college. Further information about this is available at www.ox.ac.uk/students/academic/complaints

2 Practicals

2.1 Practical Sessions

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. You will find more information about how to sign up for practicals (signing up, signing off and submission of reports, assessment) in the Courses section of the website of the Department of Computer Science https://www.cs.ox.ac.uk/teaching/courses/2023-2024/practicals/

Please note that where a course has classes and practical sessions, students are expected to attend both.

Classes are interactive problem-solving sessions for smaller groups of students that normally last about an hour. Problems for the classes are set by the lecturer of each course. Your work on these exercises must be handed in by the required deadline for assessment by the person running the classes for that subject. Model solutions will be provided to all students after the class has taken place. Each class has a marker and a tutor. The marks from the tutorial exercises will be made available to your academic advisor for information. The timetable for these classes (and the associated deadlines) will be published on the Minerva database.
Courses with practicals normally have 4 classes; courses without practicals normally have 6-7 classes.

2.1.1 Timetable

Practicals will usually start in week 3 of the term and there are normally four to six 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.
You might also need to work on the practicals in your own time, outside the scheduled practical sessions.

2.1.2 Attendance

Because we want to make sure that you'll get all the guidance you need, and progress well, attendance at practical sessions is compulsory until you have completed the practical. The demonstrators will keep a record of your presence and update attendance and practical completion details on Minerva.

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. You can find information on how to contact them on Minerva.

2.2 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. 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.

You may want to produce the report using a text formatter like TeX or LaTeX, or a word processor. 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.

2.3 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.

2.4 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. They 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.

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.

All the practical reports must be submitted to the examiners at the end of the year. **You must submit them to the Examiners, online via Inspera, by 12 noon on Friday 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.

2.5 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.

The Examiners will not take into account practical reports unless they have been "signed by a demonstrator". 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, demonstrators will not mark work that is late, unless there are extenuating circumstances.

2.6 Difficulties

If you are having difficulties in your practicals please make sure you speak to your academic advisor or a member of the Academic Admin Team as soon as possible.

3 Examinations

Courses are examined either by mini projects (sometimes called take-home assignments) or by written examination.

Students are allowed to take examinations in a maximum of four courses per term. This means that: students can submit a maximum of four mini-projects at the end of Michaelmas Term; and a maximum of four mini-projects at the end of Hilary Term; and can sit a maximum of four examinations during Trinity Term. In practice, students normally take examination in 6-8 courses over the academic year.

3.1 Preparation

Your advisor and the course lecturer will advise you about revision and practice.

Past examination papers are a good guide to the sort of examination question that you might be set. A word of caution: the syllabus for examinations changes over time, and is certainly not determined by what has appeared in past papers. Past papers can be found at: https://www.cs.ox.ac.uk/teaching/internal/papers/index.html

If you have any questions or concerns about preparing for exams, you can discuss these with your academic advisor, the course lecturer or the MSc Course Director.

3.2 Entering for Examinations

Examination entry is an online process using Student Self Service. You will receive an email invitation to log into Student Self Service to complete your examination entry assessment selections by a given date. Your selections will be validated and confirmed by a series of display screens within Student Self Service, and you will be able to log back in and change your choices within the examination entry window as many times as you wish. A few weeks before the examinations begin a timetable showing where and when each of the written papers will happen will be published online.

Information on (a) the standards of conduct expected in examinations and (b) what to do if you would like examiners to be aware of factors that may have affected your performance before or during an examination (such as illness, accident or bereavement) are available on the Oxford Students website: www.ox.ac.uk/students/academic/exams/guidance

MSc students will complete examination entry at two points in the academic year – once in Week 4 of Michaelmas Term for Michaelmas Term and core assessments, and once in Week 1 of Hilary Term for Hilary and Trinity Term assessments.

3.3 Notices to Candidates

Before your examination you will receive one or more letters of notice to candidates from the examiners. These notices, sent by the Academic Administration Team, contain important information about your examinations and should be read very carefully. If you have any

questions then please ask graduate.studies@cs.ox.ac.uk; you must **not** contact the examiners directly.

3.4 Mini-projects

Computer Science mini-projects will be released at noon on the last Friday of the term in which the subject is being taught. This information will be included in the Notice to Candidates sent out each term.

Mini-projects will be released via Inspera and must be uploaded to Inspera by noon on the date specified below. The mini-project will be designed to be completed in about three days. It will include some questions that are more open-ended than those in a standard sit-down exam. The work you submit must be entirely your own work. If you make use of material from web-sites, books, articles or other sources you must acknowledge these and give suitable references.

The University's code of conduct concerning academic integrity and plagiarism is set out on the website here. Further information can be found in Annexe A at the end of this handbook.

The mini-project must be submitted no later than that detailed below, unless permission has been received from the Proctors' Office. You can find out more information here: https://www.ox.ac.uk/students/academic/exams/problems-completing-your-assessment.

Work may be submitted in advance of the deadline if you choose. In doing this you will also avoid any issues that may arise due to IT problems and lead to late submission.

Michaelmas Term 2023

Course
Computer-Aided Formal Verification
Concurrent Algorithms and Data Structures
Quantum Processes and Computation
Computational Learning Theory
Computational Biology
Distributed Processes, Types and Programming
Graph Representation Learning

The submission deadline for the all mini-projects listed above is **12pm on Wednesday, 3rd January 2024.**

Hilary Term 2024

Course
Advanced Security
Algorithmic Foundations of Collective Decision Making
Categories, Proofs and Processes
Computational Medicine
Database Systems Implementation
Law and Computer Science

Geometric Deep Learning
Foundations of Self-Programming Agents
Lambda Calculus and Types
Quantum Software
Uncertainty in Deep Learning

The submission deadline for the all mini-projects listed above is **12pm on Wednesday 10th April 2024.**

Course
SC8 Topics in Computational Biology

The submission deadline for the mini-project listed above is **12pm on Monday 29 April 2024**.

3.5 Written Examinations

Some courses are assessed through a three-hour written examination in Trinity Term. For these courses, there are often three questions and you should answer all questions. The marks for each part of each question will be indicated on the examination paper.

You can expect the examinations for the MSc to be held in the Examinations Schools on the High Street. The location of your examinations will be confirmed on your timetable. Please look at the screens in the foyer to find out in which room your exam is going to be sat.

You must wear full academic dress (sub fusc, gown and mortar board/cap) to attend public examinations, and you must bring your University card and your own stationery with you. Please find more information on what you can and cannot take into an examination here.

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. If you get there in the first half hour, you will still be permitted to sit the exam, although you will have less time. 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 or student number) 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 University's regulations require that you write in black or blue ink, rather than pencil, although you may use pencil for any graphs and drawings. Please start the answer to each question on a

new booklet. This makes it much easier for the marker(s) – sometimes exam scripts need to be split between markers, and that's difficult to do if you have the answer to more than one question in a booklet. If you do start part way through a booklet by accident, please make a clear note of the fact!

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 an empty booklet for that part, so that the examiners can check that all parts of all papers are accounted for.

In 2023-24, the following courses will be examined by written examination at the following times:

Combinatorial Optimisation	Trinity Term
Computational Game Theory	Trinity Term
Computer Security	Trinity Term
Computer Vision	Trinity Term
Knowledge Representation & Reasoning	Trinity Term
Machine Learning	Trinity Term
Principles of Programming Languages	Trinity Term
Probabilistic Model Checking	Trinity Term
Probability and Computing	Trinity Term
Quantum Information	Trinity Term

The finalised timetable will be made available at
www.ox.ac.uk/students/academic/exams/timetables

3.6 Satisfying the Examiners

To satisfy the examiners for the degree of MSc in Advanced Computer Science, a candidate must attain an average of at least 50 (pass) across their best six courses, pass in the dissertation, pursue an adequate course of practical work and achieve an overall pass in practicals, and (unless dispensed) satisfy the examiners in the viva voce examination.

The decision of the examiners will be based upon two things: the standard set in previous examinations, and the stated aims of the MSc in Advanced Computer Science.

3.6 Viva Voce

The examiners have the right to require any student to attend for an oral examination in **September 2024.** You will be expected to be available on that day. The oral examination is intended to help candidates whose performance in one or both of the other parts of the examination is questionable or not quite satisfactory. If you are required to attend, you should

consult your advisor on the best method of preparing yourself. Most candidates will be dispensed from attendance.

3.7 Prizes

Three prizes, each to the value of £200, may be awarded:

- One for best overall performance in the examination;
- One for best project; and
- The Richard Bird Prize for the dissertation that best presents a piece of software, an algorithm, or a mathematical theory pertaining to program construction.

If dissertations of sufficient merit are not submitted, the award may be withheld.

3.8 Examination Conventions: Marking and Classification

Examination conventions are the formal record of the specific assessment standards for the course to which they apply. They set out how your examined work will be marked and how the resulting marks will be used to arrive at a final result and classification of your award. They include information on: marking scales, marking and classification criteria, scaling of marks, progression, resits, viva voce examinations, penalties for late submission, and penalties for over-length work.

The Examination Conventions can be found online at:
https://www.cs.ox.ac.uk/teaching/examconventions/MSCinCS

3.9 Examiners' Reports

Previous years' Examiners' reports can be found online at:
www.cs.ox.ac.uk/teaching/internal/examinersreports/MSCinCS.html

Students are strictly prohibited from contacting examiners directly. If you are unhappy with an aspect of your assessment you may make a complaint or appeal:
https://www.ox.ac.uk/students/academic/complaints .

4 Projects

4.1 Important Deadlines

- **Monday 26 February 2024 (Week 7, Hilary Term):** a project registration form must be submitted to us by this date.

- **Monday 22 April, 2024 (Week 1, Trinity Term):** a project proposal must be submitted.

- **Tuesday 3 September 2024, noon (Week -5, Michaelmas Term):** submission deadline.

- **Late September 2024 (Week -1, Michaelmas Term):** viva voce examination. The date for this will be communicated to you as soon as possible.

4.2 Choosing a project

A project might involve the specification, design and implementation of a piece of software or hardware, or the use of existing computing tools to develop some proofs or similar pieces of mathematics. You should begin by discussing your choice of project and your thoughts on who might be your project supervisor with your tutor/academic advisor.

A good starting point for the discussion is the list of outlines for suggested projects on the Department of Computer Science website:

http://www.cs.ox.ac.uk/teaching/courses/projects/

Or the recent MSc-specific list at:

https://www.cs.ox.ac.uk/michael.benedikt/thesesadvancedmsc.html

Older MSc dissertations are available on the MSc Thesis Repository database at www.cs.ox.ac.uk/msctheses

Projects need not be drawn from this list, but it may serve both as a guide to drawing up proposals and as a help in finding supervisors. Many academics are happy to discuss variations on the project topics they have suggested, or to consider different projects within the same general area that you might suggest. If you want to suggest your own project, then you should discuss the possibilities with your academic advisor and with academics working in this area. There must be a link between your project and the taught part of your course. A good way to go about it is to draft a description of what you propose to do in the style of the descriptions of the list on the website, then show it to staff who you think might be interested in supervising it. Please don't be too disappointed if your chosen academic is too busy to supervise your project; try someone else!

You should discuss with your supervisor the general area of your project, because this may help in selection of appropriate lecture modules through the year. The sooner you choose a specific project, the sooner you will be able to start background reading and investigations.

4.2.1 Proposing a project and registering

A project proposal must be approved by the relevant departmental Committee.

Whether you choose a project from the published list or propose your own, it is best to make contact with a supervisor and get their agreement before submitting your proposal. You must submit a project registration form to us by **Monday of week 7, Hilary Term**, followed by a project proposal by **Monday of week 1, Trinity Term**.

Supervisors are normally expected to be a member of the Faculty of Computer Science or Faculty of Mathematics or the Faculty of Engineering Sciences. If you want to arrange a supervisor from a department outside the Department of Computer Science, a co-supervisor from Computer Science will be required. For many existing projects there are already co-supervisors in place, but for a new project co-supervision will need to be secured as part of the approval process. If you are interested in undertaking a project supervised by an industrial partner, please consult the Graduate Studies Assistant in the first instance, who will be able to advise.

Students normally do not have difficulty arriving at a project. But if you cannot find a project, alert your advisor and/or the Graduate Studies Assistant.

Please note that the project has to be on a topic in Computer Science. You can do a project that is jointly supervised with another department or industry, but you should remember that the project should demonstrate your understanding and ability to exploit and integrate the material you have learnt from the courses you have taken.

If you have chosen a project which is not on the approved list on the website, in addition to submitting your registration form, you must submit a summary of your selected project to the graduate studies team before **Monday of week 1 of Trinity Term**. This must be accompanied by a proposal of one to two thousand words describing the project, including:

- Background: the theory or application areas;
- General open questions;
- Selection of particular question for study;
- Proposed method;
- Draft Timetable;
- Signature of Project Supervisor.

If, after submitting your project proposal, you wish to make a change, it is possible, but please note the following. If the change is in topic or title, and your supervisor approves the change, this is acceptable, but please inform the Academic Administration team. A change in supervisor would require the approval of the Course Director, and should be requested via the Academic Administration team.

4.2.2 Ethics Approval

Depending on the topic of your project, you might need complete an Ethics Review before you can start. Please find further guidance here: https://www.cs.ox.ac.uk/research-ethics/

4.2.3 Overleaf

All members of the Department of Computer Science have now access to the Overleaf service (which is an online collaborative LaTeX editing service, please see https://www.overleaf.com), with the features of a Professional subscription (please see https://www.overleaf.com/user/subscription/plans).

It is not required to use Overleaf, but interested students can contact departmental IT for more details.

4.3 Working on your project

4.3.1 Amount of work

The effort you put into the project and the report should be roughly equivalent to that required for five subject courses, with the associated practical work and assignments/written examinations.

4.3.2 Supervision

You should agree with your supervisor how often you will meet and for how long at the start of the project work. You should contact your supervisor to arrange meetings, please do not wait for your supervisor to contact you. If you find that your supervisor does not respond please speak to the Academic Admin team.

4.3.3 Context and Scope

To decide on the exact scope of your project you first need to investigate the background and context of the area you are working on. Your project should address a well-chosen set of concerns that are appropriate to this context. Ideally, you should identify a small number of more difficult problems, and use your project as a vehicle to explore solutions to them.

An MSc project should contain an original contribution, although not necessarily to the level of a research paper. For example, a project that involves implementing an algorithm or technique should contain a clear explanation of the underlying theory, a significant amount of testing, as well as evaluation and assessment of the different methods chosen. Similarly, a project that contains an exposition of a recent development in theoretical computer science should contain an original presentation of the relevant theory, e.g. containing new illustrative examples and new, helpful, notation and terminology, and perhaps original proofs of certain propositions and lemmas.

An MSc project should contain an original contribution. The expected standard is that of a good internal project report in industry. Some past dissertations have reached publication standard; others have been the starting points for research programmes.

4.3.4 Choice of Technology

The project should be implemented using appropriate technology. The report should contain a brief explanation of why the technical solution (such as a programming language and libraries) was chosen, but a long comparison of alternative approaches is unnecessary.

It is good to choose a technological basis that makes the programming easier, allowing you to concentrate on distinctive aspects of your problem area. For example, you could use a networking library that supports transmission of structured values instead of building the same functionality from scratch, and that would be sensible if the point of the project is some higher-level application. Or you could use a functional programming language to make a prototype of a compiler and abstract machine and avoid the heavy work of implementing these in low-level code.

4.3.5 What to do if things go wrong...

If you feel something is not as it should be, and you are not on track with your work, for whatever reason, let us know! The sooner someone is made aware of any issues you have the more likely they are to be able to help. Please speak to your supervisor in the first instance. If you feel this is not appropriate, or if you can't get hold of them, please do speak to someone in the Computer Science Academic Admin team!

4.4 Writing your project report (MSc Dissertation)

Your report is the only way that your achievement is communicated to the examiners. Its writing should therefore be treated as a substantial part of the work involved and a suitable amount of the time should be allocated to it – perhaps a fifth.

It is a very good idea to write the report as you go along: it is far easier to describe things when they are still fresh in your mind. Of course, your ideas will develop as the project proceeds, so you will have to go back and revise material at the end.

4.4.1 Writing Skills

Overseas students whose first language is not English are encouraged to investigate attending one of the courses on English for Academic Study given in the University Language Centre.
See http://www.lang.ox.ac.uk/

Please see also Steve New's Academic Writing Skills Guide which includes a short bibliography on this topic.

4.4.2 Target audience

In writing your final project report, you will find it helpful to have a target audience in mind. You should write as if for a computer scientist who is not a specialist in the topic. They will expect a concise summary of the background reading you did as you began the project, an outline of how your software works, what the components do, and how they fit together, so that they get the big picture without being overwhelmed by detail.

4.4.3 Structure and contents

The report should be considered to be a technical document designed to be readable by a computer scientist who is not a specialist in the topic, say one of your colleagues.
The sort of structure that would suit many programming projects is as follows:

- Abstract: a brief description of what you did; about 200 words.
- Contents.
- Chapters 1, 2, etc. Areas to cover: Introduction, Explanation of the Problem or Context, Description of the Method, Account of the Work (several chapters, the main body of the dissertation), Conclusions.
- A bibliography and list of references.

You might find it useful to consult Maggie Charles's handout from a writing seminar she ran.

Material that is used to support the work but does not have a place within the body of the text may be included as an appendix. Typical examples include program code, mathematical proofs, and sample output.

It is appropriate for supervisors to read and comment on a draft of the report, and to offer advice on suitable references and methods. It is also possible for the work reported upon to be a part of a piece of work being undertaken by several people, but the contribution of the individual project must be clearly identifiable, and clearly explained in the report. The report must be the work of you alone (except for any clearly identified common material in joint projects).

For details on the University's policy on proof-reading, including what a third party proof-reader may and may not do, please visit https://academic.admin.ox.ac.uk/policies/third-party-proof-readers

4.5 Submission of the project dissertation

The report must not exceed 30,000 words plus 30 pages of additional material. The word count may exclude any table of contents, all mathematical equations and symbols, diagrams, tables and the bibliography. The associated source code is neither included in the word count nor the 30-page limit of additional material. However any preface, footnotes, and appendices must be included.

Note that these figures are *limits*, not targets.

Word count does not include:

- Table of contents
- All mathematical equations and symbols
- Diagrams
- Tables
- Bibliography
- Texts of computer programs
- Headings that are included on the top of each page (in the 'Header' field).
- Acknowledgements (not in the preface)
- Algorithm pseudocode if it is part of a table or a figure

Word count includes:

- Preface
- Footnotes
- Appendices
- Captions for the diagrams and tables
- Headings
- Algorithm pseudocode if it is part of the text/ narrative
- Text from a mathematical proof

State the word count on the title page. Also add your candidate number. Do not include your name, your college, or anything in the acknowledgements that could identify you.

4.5.1 Formatting

- Size 11 or 12 font must be used.
- Double spacing should be used for the main text; single spacing should be used for quotations and footnotes.
- The margins of the page must be 3 to 3.5cm.
- Pages of the dissertation must be numbered throughout, except for the title page.

4.5.2 Front Page

- The full title of the dissertation.
- The term and year of submission.
- Your candidate number.
- The title of the degree the dissertation is being submitted under.

The completed dissertation must be saved and uploaded as a PDF file of not more than 250MB to Inspera not later than **12pm on Tuesday of Week -5, Michaelmas Term (Tuesday 3 September 2024)**.

Source code

- If your dissertation contains or uses source code, that must be uploaded to Inspera along with your dissertation.
- Please ensure you submit a zip file containing all the documents for submission
- Alternatively, you may wish to include a link to a github site. In this case, you should ensure that this is anonymised.

The department will provide training on how to upload a dissertation to the submissions portal.

Please read the University's guidance for submitting assessments here: https://www.ox.ac.uk/students/academic/exams/submission

4.6 Assessment

The marking criteria for projects are published in the exam conventions. They are available here: http://www.cs.ox.ac.uk/teaching/examinations/

The dissertation must be submitted no later than that detailed above, unless permission has been received from the Proctors' Office. You can find out more information here: https://www.ox.ac.uk/students/academic/exams/problems-completing-your-assessment.

Work may be submitted in advance of the deadline if you choose. In doing this you will also avoid any issues that may arise due to IT problems and lead to late submission.

As mentioned above, **any code generated as part of the project must be submitted alongside the dissertation**. All formats are acceptable for the source code.

We recommend that you take time to ensure you are fully familiar with the procedures given on the submissions portal, well in advance of the submission deadline. While the Course Administrator will be available to answer questions, it is not intended that a step-by-step guide be provided, as this would be unfair to other students who wish to make contact.

Please note the following:

- It is the student's responsibility to ensure that their work is submitted by the deadline.
- Failure to submit an assignment on time as a result of IT problems (e.g. computer malfunction, slow internet connection) will not be accepted as a valid reason for late submission. You should make regular back-up copies of all work and ensure that there is adequate time to submit your work. Do not leave submission until just before the deadline.
- Responsibility for the work rests with the student at all times until issue of receipt, regardless of the method submission.
- All work will be dealt with under the standard submission procedure, whether submitted early, near the deadline, or late.

You will be informed when the assignment submission area on the Computer Science Examinations portal is open.

The regulations state that the examiners must be satisfied that the candidate has attained an adequate level of achievement in the dissertation.

Each project will be read by at least one examiner, and an assessor on behalf of the examiners. Both readers will be asked to supply comments describing the scope and achievement of the project, and will be asked to give a grade.

4.7 Intellectual Property

Please see the University's policy on Intellectual Property rights at
https://researchsupport.admin.ox.ac.uk/innovation/intellectual-property

4.8 Marking Assessments

Each band has an informal interpretation, as described in the Exam Conventions at https://www.cs.ox.ac.uk/teaching/examconventions/MSCinCS.html

5 Important Dates

Mini Projects (also known as take-home assignments)
Wednesday 3 January 2024, 12 noon (Hilary Term, week -1): online submission deadline for Michaelmas Term mini-projects.

Wednesday 10 April 2024, 12 noon (Trinity Term, week -1): submission deadline for Hilary Term mini-projects.

Monday 29 April 2024, 12 noon (Trinity Term, week 2): submission deadline for Topics in Computational Biology

Written Exams
The written examinations will be held in Trinity Term 2023. The examination timetable will be confirmed in Trinity Term.

Practical reports
Friday 24 May 2024, 12 noon (Trinity Term, week 5): submit all of your practical reports.

Project Dissertation
Monday 26 February 2024 (Hilary Term, week 7): Submit your project dissertation registration form.

Monday 22 April 2024 (Trinity Term, week 1): You must submit a proposal about the background and objectives of your project together with a plan of work. This is a strict deadline and must be adhered to. You will receive more information at the beginning of Hilary Term about the procedure for selecting your project. Your supervisor during Michaelmas and Hilary Terms will also provide you with advice. If you are experiencing particular difficulty, you should contact the Graduate Studies Office (graduate.studies@cs.ox.ac.uk.)

Tuesday 3 September 2024, 12 noon: (Michaelmas Term, week -5) online submission deadline for the dissertation.

Viva
Late September: viva voce examination date, for those students who require one.

6 Supervision

You will be allocated an academic advisor, who is usually a member of academic or research staff in the Department of Computer Science. During term you are expected to remain in close contact with your academic advisor. You should meet with your academic advisor at least twice per term. Your academic advisor is your main academic contact on the course.

6.1 Graduate Supervision Reporting

Graduate Supervision Reporting (GSR) is used by academic advisor to review, and comment on their students' academic progress each term. Students are also given the opportunity to comment on their progress. Access to GSR will be via Student Self Service https://www.ox.ac.uk/students/selfservice. You will receive an email notification with details of how to log in at the start of each reporting window.

It is mandatory to complete a self-assessment report every reporting period. If you have any difficulty completing it, speak to your academic advisor or Director of Graduate Studies (DGS). Your self-assessment report will be used by your academic advisor(s) when completing a report on your performance, for identifying areas where further work may be required, and reviewing your progress against agreed timetables and plans for the term ahead. GSR will alert you by email when your academic advisor or DGS completes your report and it is available for you to view.

Use this opportunity to:

- Review and comment on your academic progress during the current reporting period;
- Measure progress against the timetable and requirements of your study programme;
- Identify skills developed and training undertaken or required;
- List your engagement with the academic community;
- Raise any concerns regarding your academic progress to your academic advisor;
- Outline your plans for the next term (where applicable).

Students and academic advisor are reminded that having a positive student-advisor relationship is an important factor in student success. Research suggests that one of the strongest predictors of postgraduate completion is having expectations met within the student-advisor relationship.

Oxford's approach to graduate study emphasises the individual student's ability to work independently, to take the initiative in exploring a line of research, or in acquiring a new skill or identifying and remedying a perceived area of weakness. Your academic advisor will meet you at agreed times if you encounter particular problems or difficulties that you need to discuss.

If you have any issues with teaching or supervision please raise these as soon as possible so that they can be addressed promptly.

6.2 Guidance for MSc in Advanced Computer Science Students and their academic advisors

6.2.1 Responsibilities of the academic advisor

In agreeing to be an academic advisor for an MSc student, the academic advisor must recognise and accept the responsibilities both to the student and to the divisional board. Academic advisors should aim to meet with their new students ideally in 0th week but no later than the end of week 1.

The academic advisor is responsible for assisting the student in the selection of options and ensuring that the student has the correct background for particular courses. Students must submit an online form by Monday of week 4 indicating courses they intend to follow. The academic advisor is also responsible for advising the student about attendance at classes and requisite techniques (including helping to arrange special instruction where necessary).

The academic advisor is responsible for assisting the student in the selection of options and ensuring that the student has the correct background for particular courses. The academic advisor is also responsible for advising the student about attendance at classes and requisite techniques (including helping to arrange special instruction where necessary).

The academic advisor should meet with the student a minimum of twice a term. Times should be fixed to ensure that a busy advisor does not inadvertently find that meetings are less frequent than the student would like, and to give sufficient time for the student to discuss the work. The academic advisor should also be accessible to the student at other appropriate times when advice is needed.

During meetings the academic advisor should ask about the Student's class work and practical work. If a student exhibits a consistent weakness and misunderstanding, academic advisors should inform the Director of the MSc and the Graduate Studies Office as soon as possible so that the arrangement of extra special supervision can be authorised.

The academic advisor should try to ensure that the student feels properly directed and able to communicate with the academic advisor. It is essential that when problems arise, corrective action is clearly identified and full guidance and assistance are given to the student.

If the academic advisor is unable to see a student due to unforeseen circumstances they should inform the Graduate Studies Office so that alternative arrangements can be made.

If a student regularly fails to keep appointments the academic advisor should inform the Graduate Studies Office who will inform the Tutor for Graduates at the student's college and the Director of the MSc.

The academic advisor is required to report on the student's work at the end of each term using GSR**.** Each report should state the nature and extent of recent contact with the student. The report should also make clear whether the student is making satisfactory progress.

6.2.2 Responsibilities of the student

The student must accept his or her obligation to act as a responsible member of the University's academic community.

The student should take ultimate responsibility for his or her studies and develop an appropriate working pattern, including an agreed and professional relationship with the advisor. The student should discuss with the advisor the type of guidance and comment which he or she finds most helpful and agree a schedule of meetings.

The student should make appropriate use of the teaching and learning facilities available within the University. Students should make full use of the facilities for career guidance and development and should consult their advisor for advice where appropriate.

It is the student's responsibility to seek out and follow the regulations relevant to his or her course, including departmental handbooks/notes of guidance, and to seek clarification from advisors and elsewhere if this is necessary.

The student should not hesitate to take the initiative in raising problems or difficulties, however elementary they may seem. He or she should ensure that any problems regarding the project are drawn to the attention of the advisor so that appropriate guidance may be offered.

If the student feels there are good grounds for contemplating a change of supervision arrangements, this should first be discussed with the academic advisor or, if this is difficult, with the Head of Academic Administration or the Director of the MSc course.

The student should seek to maintain progress in accordance with the plan of work agreed with the academic advisor. Both the student and the academic advisor should keep a record of all formal, scheduled meetings. They may wish to agree a record of what has been discussed and decided.

The student should recognise that the academic advisor may have many competing demands on his or her time. The student should give adequate notice of unscheduled meetings. The need for adequate notice also applies to requests for meetings from the academic advisor.

The student should be aware that the provision of constructive criticism is central to a satisfactory supervisory relationship, and should always seek a full assessment of the strengths and weaknesses of his or her work.

Where problems arise it is essential that a student gives full weight to any guidance and corrective action proposed by the academic advisor.

Students should ensure that they allow adequate time for writing up their dissertation and should not take up employment before the submission deadline. Particular attention should be paid to final proof reading.

7 If things go wrong

If circumstances begin to affect your health or your work, do not delay in consulting your medical advisor or one of the many advisors allocated to you by the Department and your College. Nearly all problems, whether emotional, medical or psychological, can be solved or alleviated by those who have the experience and expertise to advise, provided that they know early enough. Please come and speak to the Academic Admin Team if you are unsure where to go for help.

7.1 Health and Welfare

The University Oxford Students website contains comprehensive advice on a variety of issues around student health and welfare. You have free access to the National Health Service, and can see a GP (General Practitioner) when you need to. Emergency medical treatment can be obtained at the Emergency Department (A&E) of the John Radcliffe Hospital. You can find more advice on what constitutes a medical emergency, and what to do if a medical emergency arises, here.

If you experience sexual violence you can get help and advice here.

Please click here for a list of emergency contacts.

If you have a disability, or think you might, please find advice on how to get support here.

Your mental health is just as important as your physical health. Approximately 1 in 4 people in the UK will experience a mental health problem each year, and there is no shame in admitting you are one of them. There is a variety of things you can do yourself to boost your mental health. The University offers advice on self-help strategies, and a free counselling service for students. It is important that you seek help as early as possible, so that you can be provided with the support you need.

If you think you or someone you know might have a problem with their mental health, please speak to your academic advisor, your college tutor or the Academic Admin team.

If you need advice on where to turn, or someone to talk in the Department of Computer Science, please approach one of our Mental Health Champions. They have received training through Mental Health First Aid (England), regarding mental health which enables them to listen non-judgmentally, providing that first port of call within our department if you need it, and signposting further sources of support where necessary.

7.2 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 inconvenience or unhappiness, particularly if persistent.

The University's Oxford Students website provides help and advice for students here. Please also consult the University's Harassment Policy.

The Harassment Advisors for the Department of Computer Science are:

- Christoph Haase (christoph.haase@cs.ox.ac.uk): Wolfson Building, room 403; extension 10368
- Olivia Man (olivia.man@cs.ox.ac.uk) : Wolfson Building, room 116; extension 83607
- Miranda Reilly (miranda.reilly@cs.ox.ac.uk): Wolfson Building, room 104; extension 87364
- Jordan Summers (jordan.summers@cs.ox.ac.uk): Wolfson Building.
- Martin Vassor (martin.vassor@cs.ox.ac.uk): Wolfson Building, room 404; extension 10778
- Paolo Perrone (paolo.perrone@cs.ox.ac.uk): Wolfson Building, room 331; extension 73618
- Sandra Kiefer (sandra.kiefer@cs.ox.ac.uk)
- Hector Martinez-Navarro (hector.martinez-navarro@cs.ox.ac.uk)

7.3 Equality, diversity and inclusion

Our Commitment

We are committed to equality for all our students and employees. Our goal is to be as diverse as the community around us and for everyone in the department to value that diversity. We are on a programme of continuous improvement to help us achieve that aim. Please find more information here.
https://www.cs.ox.ac.uk/aboutus/equality-diversity-inclusion/

7.4 Difficulties

If you have difficulty in understanding a lecture, please discuss it with your advisor, or the class tutor for the course; at least one of them should be able to make an explanation that meets your needs. If you find the lectures unsatisfactory in any other way, please tell the lecturer or your advisor; they are keen to make improvements where possible. If you find any aspect of your supervision unsatisfactory and you feel unable to discuss it with your advisor, you should contact one or more of the following members of staff: your academic advisor; the MSc Course Director; the Academic Administration Team or (in exceptional circumstances) the Head of Department.

7.5 Complaints and Appeals

The University, the MPLS Division and the Department of Computer Science all hope that provision made for students at all stages of their course of study will make the need for complaints (about that provision) or appeals (against the outcomes of any form of assessment) infrequent.

If you do think you have grounds for a complaint or an academic appeal, you can find details about the University's complaint procedure here.

However, nothing in the University's complaints procedure precludes an informal discussion with the person immediately responsible for the issue that you wish to complain about (and who may not be one of the individuals identified below). This is often the simplest way to achieve a satisfactory resolution.

Many sources of advice are available within colleges, within faculties/departments and from bodies like Student Advice Service provided by OUSU or the Counselling Service, which have extensive experience in advising students. You may wish to take advice from one of these sources before pursuing your complaint.

General areas of concern about provision affecting students as a whole should be raised through Joint Consultative Committees or via student representation on the Department's committees.

Complaints

The Department has a complaints procedure which can be found here: https://www.cs.ox.ac.uk/teaching/curstudents/documents/MPLS%20Division%20-%20Complaints%20Student%20Guidance.pdf

If you are dissatisfied with the outcome, then you may take your concern further by making a formal complaint to the University Proctors. The procedures adopted by the Proctors for the consideration of complaints and appeals are described on the Proctors' webpage, the Student Handbook and the relevant Council regulations.

If your concern or complaint relates to your college, you should raise it through the College's procedures.

Academic appeals

An academic appeal is defined as a formal questioning of a decision on an academic matter made by the responsible academic body.

For taught graduate courses, a concern which might lead to an appeal should be raised with your college authorities and the individual responsible for overseeing your work. It must not be raised directly with examiners or assessors. If it is not possible to clear up your concern in this way, you may put your concern in writing and submit it to the Proctors via the Senior Tutor of your college.

As noted above, the procedures adopted by the Proctors for the consideration of complaints and appeals are described on the Proctors' webpage, the Student Handbook and the relevant Council regulations.

Please remember in connection with all the academic appeals that:

- The Proctors are not empowered to challenge the academic judgement of examiners or academic bodies.
- The Proctors can consider whether the procedures for reaching an academic decision were properly followed; i.e. whether there was a significant procedural administrative error; whether there is evidence of bias or inadequate assessment; whether the examiners failed to take into account special factors affecting a candidate's performance.

- On no account should you contact your examiners including external examiners or assessors directly.

7.6 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.

You will be asked to complete a questionnaire for each lecture course you attend. Please take the time to complete this and return it, as feedback is greatly valued by the Department, and plays a large part in the quality assurance process.

Students on full-time and part-time matriculated courses are surveyed once per year on all aspects of their course (learning, living, pastoral support, college) through the Student Barometer. Previous results can be viewed by students, staff and the general public at: www.ox.ac.uk/students/life/student-engagement

7.7 Student Representative

You will be asked to nominate a student representative(s) to sit on the MSc Supervisory Committee which meets once a term in week 3. Once confirmed, the names and email addresses of the student representative(s) will be circulated to the Cohort, and an additional reminder will be sent out prior to the Supervisory Committee each term. Please make sure that the representative is aware of any concerns or comments you have regarding the course.

8 What Next?

8.1 Higher Degrees

Some students undertake the MSc course specifically as initial preparation for doing PhD level research; others discover an interest in doing research during the course. If you wish to be considered for a research place in the Department, you will have to apply following the standard applications procedure. The process and deadlines are documented on the Department's website, and you are encouraged to consult the information provided there.

To apply: the University of Oxford has published a very useful application guide. Applications are made online. You will need two or three references; it is usual to choose tutors, project supervisors and college lecturers.

The admission deadline for entry in 2024-25 is **Friday 1 December 2023**.

If you have questions about graduate study in the Department of Computer Science please pop in and see a member of the graduate team or email graduate.admissions@cs.ox.ac.uk

You will need to include a research proposal or a statement of your research interests and further information on what is required can be found here:
www.cs.ox.ac.uk/admissions/graduate/dphil-computer-science/statement

Of course, it's a good idea to have informal discussions with potential DPhil supervisors in the Department, before proceeding to a formal application. Perhaps you are thinking of a research proposal arising from your MSc project, in which case you should discuss your ideas with your project supervisor. Perhaps you have become interested in the research area of one of your lecturers or another member of the Department; get in touch with them to talk about it. The Director of Graduate Studies or the Graduate Studies Administrator are also happy to talk informally about doing a DPhil.

8.2 Careers

Information about careers is provided by Oxford University Careers Service, 56 Banbury Road. The Careers Service organise many events to help you choose a career that suits you, and to put you in touch with recruiters. Their web site is at: www.careers.ox.ac.uk.

You are urged to contact the Careers Service for detailed information on careers, and also for advice on compiling a CV, on how to apply, and on interview technique.

When we receive information about careers suitable for Computer Science graduates, it is put on the Careers notice board in the basement of the Department of Computer Science or circulated by email. Information on job vacancies (together with summer internships and competitions) can also be found on our web site at https://www.cs.ox.ac.uk/recruiters/internal/vacancies.html (NB this site can only be accessed from within the Oxford domain).

9 Recommended Patterns of Teaching

Please compare the list of courses on the Departmental Website. If in doubt, please refer to the website.

Paper	Term	Faculty			Assessment	Comments
		Lectures	Classes	Practicals		
Combinatorial Optimisation	MT	20	6		Exam	Part B course
Computational Biology	MT	20	4		Mini project	
Computational Game Theory	MT	20			Exam	
Computational Learning Theory	MT	24	6		Mini project	
Computer Aided Formal Verification	MT	16	4		Mini project	Part B course
Computer Security	MT	16	4		Exam	Part B course
Concurrent Algorithms and Data Structures	MT	20	4	Y	Mini project	
Distributed Processes, Types and Programming	MT	20		Y	Mini project	
Graph Representation Learning	MT	20	0	Y	Mini project	
Law and Computer Science	MT/HT	16/16	0	Y	Mini project	
Machine Learning	MT	20	4	Y	Exam	Part B course
Principles of Programming Languages	MT	16	4	Y	Exam	Part B course
Probabilistic Model Checking	MT	20	4	Y	Exam	
Probability and Computing	MT	20	6		Exam	
Quantum Processes and Computation	MT	24	6		Mini project	
Advanced Security	HT	22	4	Y	Mini project	
Algorithmic Foundations of Collective Decision Making	HT	20			Mini project	
Computational Medicine	HT	20			Mini project	

Computer Vision	HT	21			Exam	
Categories, Proofs and Processes	HT	20			Mini project	
Database Systems Implementation	HT	22	6	Y	Mini project	
Foundations of Self-Programming Agents	HT	20	6		Mini project	
Geometric Deep Learning	HT	18		Y	Mini project	
Knowledge Representation and Reasoning	HT	24	5		Exam	
Lambda Calculus and Types	HT	16	7		Mini project	Part B course
Quantum Information	HT	16	6		Exam	Part B course
Quantum Software	HT	24	5		Mini project	
SC8 Topics in Computational Biology	HT	16	4		Mini project	Taught by the Department of Statistics
Uncertainty in Deep Learning	HT	20		Y	Mini project	
Notes: Students can take a maximum of 2 (two) Part B courses. Students are also required to undertake a project in Trinity Term.						

Annexe [A] Plagiarism

The University's code of conduct concerning academic integrity is set out on the website here. Please read also the University's guidelines on academic good practice.

The following information and advice is of relevance and use to students for all their academic work, e.g. mini-projects, MSc Dissertations, 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 early in the academic year:

Avoiding Plagiarism

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. Plagiarism may be intentional or reckless, or unintentional. Under the regulations for examinations, intentional or reckless plagiarism is a disciplinary offence.

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.

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.

We strongly recommend that you review the University's guidance on plagiarism here: https://www.ox.ac.uk/students/academic/guidance/skills/plagiarism

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 can be found on the Computer Science website.