



PROJECT HANDBOOK

Computer Science
Computer Science & Philosophy
Mathematics & Computer Science

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1. Who needs to do a project?

1.1 Third Year Projects

Computer Science students can choose to undertake a project in the third year; if you are a Mathematics and Computer Science or Computer Science & Philosophy student you do not do a project in your third year.

1.2 Fourth Year Projects

All Computer Science students are required to undertake a project in the fourth year. If you are a Mathematics and Computer Science student you are required to take either a Computer Science project or a Mathematics dissertation; a Mathematics dissertation must be a whole unit. If you are a Computer Science and Philosophy student you have the option of taking a Computer Science project or a Philosophy thesis.

This document describes Computer Science projects; please refer to Mathematics for details on Maths dissertations, and Philosophy for details on Philosophy theses.

If you have any general questions about projects, please don't hesitate to get in touch with the Academic Admin Team at (academic.administrator@cs.ox.ac.uk).

You can also contact the departmental projects coordinator, Professor Vincent Cheval (vincent.cheval@cs.ox.ac.uk).

2. How to get going

2.1 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.

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/

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 tutor/ 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.

If you have engaged an academic in discussion about doing a project with them but have decided to do a project with a different supervisor, please inform them of this change as it is important for allocation projects to others.

2.2 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 his or her agreement before submitting your proposal. **Undergraduate students will be expected to make arrangements with potential supervisors between weeks 5 and 7 in Hilary Term, for project work for the following year**. Please don't contact potential supervisors outside this window.

Supervisors are normally expected to be a member of the Faculty of Computer Science. If you choose a supervisor from a department outside the Department of Computer Science, the Project Committee would normally assign you a co-supervisor from Computer Science. If you are interested in undertaking a project supervised by an industrial partner, please consult the Academic Admin Team in the first instance, who will be able to advise.

If you can't find a supervisor yourself, please indicate at least three projects from the list on the website (from at least two different possible supervisors) and the relevant Committee will find you an appropriate supervisor.

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.

Proposals have to be submitted by **Monday of week 7 of Hilary term**. If you are an undergraduate student, you will submit your project proposal in the year before you submit your project. Please complete the online survey when invited to do so. If you are proposing a project that is not on the list on the website, you will need to submit a project outline in about 100 words: it should contain information on the project's scope, focus, research question, and method.

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

2.3 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://intranet.cs.ox.ac.uk/research-support/research-ethics/

3. Working on your project

3.1 Amount of work

A Part C project amounts to about one third of the work in the year in which you are submitting it, and one third of the examination credit, and so should be thought of as occupying about a term's work in total. A Part B project is about one quarter of the work in the year, and one quarter of the examination credit. For the project to go smoothly without you feeling under time pressure, it is important to settle on your project and find a project supervisor by the end of Hilary Term of the preceding year, and make good preparation over the Long Vacation. You should try to finish the first draft of your report during the Easter vacation of the year of submission.

3.2 Supervision

You should expect to see your supervisor for half an hour per week, or for longer on a less frequent basis, equivalent to six one-hour tutorials per term in total. 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 your tutor/academic advisor in the first instance, or get in touch with the Academic Admin Team.

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.

Although fourth year projects are similar in style to third year projects, students are expected to provide a greater contribution and show a greater depth of understanding and accomplishment, and to competently use advanced concepts and methods from 3rd and 4th year courses.

A fourth year 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.

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.

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 or tutor/academic advisor 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. Reporting along the way

You are required to submit a progress report for each term of your project. This is an informal report which should detail your progress of the last term and should flag up any problems you may have encountered, including project supervision. You are welcome to ask for the whole report or parts of the report not to be disclosed to your supervisor (if you are experiencing problems). Your report will be forwarded to your college tutor and supervisor, who will discuss any issues of supervision or progression with you.

This is an opportunity for you to provide constructive feedback to us and your supervisor: use it!

5. Writing your project report

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.

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.

5.1 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/

5.2 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.

5.3 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 an MSc writing seminar she ran. The focus is on general science dissertations at MSc level but most of the information is applicable in general.

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). **Please see your course handbook on plagiarism.**

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://governance.admin.ox.ac.uk/education-committee/policies/third-party-proof-readers

6. Submitting the Report

For Part B students
The report must not exceed 5,000 words plus forty pages of additional material (e.g. diagrams, program text). The word count may exclude any table of contents, all mathematical equations and symbols, diagrams, tables, bibliography and the texts of computer programs. However, any preface, footnotes and appendices must be included.

For Part C students:
The report must not exceed 10,000 words plus forty pages of additional material (e.g. diagrams, program text). The word count may exclude any table of contents, all mathematical equations and symbols, diagrams, tables, bibliography and the texts of computer programs. 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.

6.1 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.

6.2 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.

6.3 Mode of Submission

The project report must be saved and uploaded as a PDF file of not more than 250MB to Inspera by noon on Monday of the fourth week of the Trinity Term of your third or fourth year.

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

Please note the following:

- It is your own responsibility to ensure that your work is submitted by the deadline.
- Failure to submit an assignment on time as a result of IT problems (eg 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 you at all times until issue of receipt, regardless of the method submission.

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

6.4 Assessment

The marking criteria for projects are published in the exam conventions. They are available in Examination Conventions on Moodle.

7. Supervisor's Report

Your supervisor will submit a report about the project and the amount of help they gave. Your supervisor will want to be able to report to the examiners that the software is working properly, and for this purpose you should make sure that (s)he sees a demonstration of it in action towards the closing stages of the project. It is up to you to agree with them when this takes place and what form of demonstration is appropriate to the kind of software you have developed. There is no need to arrange a separate, formal demonstration if the supervisor has seen the software in action over the course of its development.