Research Skills: homework & exercises

This document details all of the homework and exercises associated with each of the lectures. Check the course website for resources. Lecture times are Thursday 10 a.m. and Monday 2 p.m.

http://www.cl.cam.ac.uk/teaching/1112/C00/

	Date	Venue	Subject	Lecturer	Home work*	Related exercise	Deadlines (at 4 p.m.)
1	**6 Oct**	FW26	Reading 1	Dodgson	Preface & Ch 1	1 (read)	
2	**10 Oct**	LT2	Reading 2	Dodgson	Ch 12	2 (review)	Exercise 1
3	**13 Oct**	FW26	Presenting 1	Dodgson	Ch 14	8 (present)	
4	**17 Oct**	LT2	Writing 1	Dodgson	Ch 2, 3	3 (summarise)	Exercise 2
5	**20 Oct**	FW26	Writing 2	Dodgson	Ch 4, 8	4 (edit)	
6	**24 Oct**	LT2	Experiment	Robinson	Ch 11	6 (analyse)	Exercise 3
7	**27 Oct**	FW26	Writing 3	Dodgson	Ch 9	5 (reduce)	
8	**31 Oct**	LT2	Statistics 1	Robinson	*Web*	6 (analyse)	
9	**3 Nov**	FW26	Research	Dodgson	Ch 10, 13		Exercise 4
10	**7 Nov**	LT2	Statistics 2	Robinson	*Web*	6 (analyse)	
11	**10 Nov**	FW26	Graphics 1	Dodgson	Ch 6	7 (graph)	Exercise 5
12	**14 Nov**	LT2	Writing 4	Peyton Jones	*Web*		
13	**17 Nov**	FW26	Graphics 2	Dodgson	Ch 5,7		
14	**21 Nov**	LT2	Presenting 2	Dodgson		8 (present)	
15	**24 Nov**	FW26	Presenting 3	Dodgson		8 (present)	Exercise 6
16	**28 Nov**	LT2	Presenting 4	Dodgson		8 (present)	Exercise 7
	May 2012						Exercise 8

*Home work reading should be done *before* the lecture

Lecture 1: introduction to the course & how to read a paper

Homework

Read *Writing for Computer Science* preface and chapter 1 "Introduction".

Exercise 1: reading

Deadline: the day of lecture 2.

Contribution to final grade: 5%.

[WfCS exercise 1] Read the academic paper "The virtues of opaque prose: How lay beliefs about fluency influence perceptions of quality". This will be handed out in Lecture 1 and is available on the course website.

Write a brief answer to each of the following questions.

a) What are the researchers trying to find out?

b) Why is the research important?

c) What things were measured?

d) What were the results?

e) What do the authors conclude and to what factors do they attribute the findings?

f) Can you accept the findings as true? Discuss any failings or shortcomings of the methods used to support the findings.

I am looking for short, factual answers to the questions. Two to four sentences should be sufficient answer for each of questions (a) to (e). Your answer to question (f) may need to be a little longer. Your whole submission must be no more than one side of A4 paper, in total.

The exercise should take three hours: reading the paper, making notes, drafting your answers, checking back to the paper, refining your answers.

Submit your page of answers to Student Administration by 4 p.m. on the day of Lecture 2.

Lecture 2: how to review a paper & the research process

Homework

Read *Writing for Computer Science* chapter 12 "Refereeing".

Exercise 2: reviewing

Deadline: the day of lecture 4.

Contribution to final grade: 10%.

Read the academic paper "Extracting the essence from sets of images", available from the course website. You need to view the paper online to see the images in sufficient quality.

Conduct a review in two parts. The first is **filling out the review form available from the course website**. The second part is up to one side of A4 containing free-form text with the following sections:

Summary: Please summarize the paper in 2-4 sentences and state what you consider to be the contributions of this paper to the field.

Major comments: Discuss the author's assumptions, technical approach, analysis, results, conclusions, reference, etc. Be constructive, if possible, by suggesting improvements.

Minor comments: This section contains comments on style, figures, grammar, typos, etc.

This exercise should take five hours: reading the paper, making notes, filling in the review form, drafting your comments, checking back to the paper, refining your comments.

Submit the completed review form (the first part) and the single page of free-form text (the second part).

Lecture 3: how to prepare a presentation

Homework

Read *Writing for Computer Science* chapter 14 “Giving Presentations”.

Lecture 4: writing—who are you writing for & style issues

Homework

Read *Writing for Computer Science* chapters 2 “Good style” and 3 “Style specifics”.

Exercise 3: summarising

Deadline: the day of lecture 6.

Contribution to final grade: 10%.

[WfCS exercise 9] Download one of the four papers listed on the course website. Summarise it in 300 words.

Your aim here is to summarise the paper, not to review it. Marks will be awarded for the quality of the summarisation (how well it represents the paper) and the quality of the writing (how well it reads). This is therefore a test both of your ability to understand someone’s writing and of your own ability to write.

This should take about five hours. One to two hours to read the paper. Two to three hours to draft, check, edit, and polish the summary.

Submit your summary.

Lecture 5: writing—more style & editing

Homework

Read *Writing for Computer Science* chapters 4 “Punctuation” and 8 “Editing”.

Exercise 4: editing

Deadline: the day of lecture 9.

Contribution to final grade: 10%.

[WfCS exercise 12] You will be given ***two*** short pieces, written by other people. Revise each of these two pieces to improve the writing style—that is, edit for spelling, grammar, punctuation, flow, expression, clarity, and so on. Mark the changes on a paper copy, then type up the result. This should take up to two hours per piece.

You will be assessed on how well you improved the originals in terms of style, but not in terms of factual content.

Submit your revised versions and your marked-up originals. Keep a *photocopy* of the marked-up versions for yourself in order that you have your own record.

Lecture 6: experiment design (*Peter Robinson*)

Homework

Read *Writing for Computer Science* chapter 11 "Experiments".

Lecture 7: writing the first draft & structuring a paper

Homework

Read *Writing for Computer Science* chapter 9 "Writing up".

Exercise 5

Deadline: the day of lecture 11.

Contribution to final grade: 15%.

This exercise is in two parts: [A] writing and [B] editing.

Part A

Write a new 300 word piece on ***one*** of the following:

1. An article for a University magazine explaining why you chose to apply for the MPhil in Advanced Computer Science and what you hope to get out of it.
2. A proposal to a University's Applications Committee explaining what you intend to do for your PhD.
3. A description of a major project that you undertook during your previous degree.

This should take up to three hours. Your finished article must be between 285 and 315 words.

Part B

[WfCS exercise 10] Use your 300 word article as a starting point. Iteratively reduce the article by 30 words. Iterate seven times, producing seven new versions of the article of length 270, 240, 210, 180, 150, 120, and 90 words. In each case the word count must be within ±7 of the target. Your aim, at each step, is to preserve the information content of the piece but not necessarily the original wording. It is common for the piece to improve in the early iterations and then to become more cryptic and incomplete in the later iterations.

This should take up to three hours.

Warning: You will get the most benefit from this exercise if you write a good article in Part A. It is possible to subvert this exercise by putting a lot of padding into the original article, in Part A. It is then easy to remove the padding in Part B. Please avoid doing this.

Submit all eight versions of the article with word counts. Remember to include the original article as the first of the eight, so that the marker can see where you started.

Also **submit** your assessment of which version is best and which is worst. You will receive credit for producing the eight versions and, additionally, the version that you identify as "best" will be marked for the quality of the writing.

Lecture 8: statistical analysis I (*Peter Robinson*)

Homework

Read the online material provided by the lecturer.

Lecture 9: how to do research & where to publish papers

Homework

Read *Writing for Computer Science* chapters 10 "Doing Research" and 13 "Ethics".

Lecture 10: statistical analysis II (*Peter Robinson*)

Exercise 6

Deadline: the day of lecture 15.

Contribution to final grade: 20%.

The exercise is available on the course website.
Submit the information requested in the exercise.

Lecture 11: graphs

Homework

Read *Writing for Computer Science* chapter 6 "Graphs, Figures & Tables"

Exercise 7

Deadline: the day of lecture 16.

Contribution to final grade: 10%.

The exercise is available on the course website.
Submit the information requested in the exercise.

Lecture 12: guest lecture: how to write a good research paper (*Simon Peyton Jones*)

Homework

Read the relevant material on Prof. Peyton Jones website.

Lecture 13: graphs, figures, tables, maths & algorithms

Homework

Read *Writing for Computer Science* chapters 5 "Mathematics" and 7 "Algorithms".

Lectures 14–16: how to give a presentation & presentation style

Homework

Browse the online resources on presentations available from the course webpage.

Exercise 8

Deadline: the day of your presentation.

Contribution to final grade: 20%.

MPhil students: in May, you will give a presentation on your Research Project or Research Essay.

PhD students: in the Summer, you will give a presentation on your PhD first year report and PhD proposal.

Your presentation will have two purposes: to allow the Laboratory to hear about your progress and to assess how well you are able to present. The first of these attracts no marks and is for your benefit. The second of these attracts marks and you will be marked for the quality of the presentation. Your presentation should be prepared so as to be comprehensible to an intelligent computer scientist who is *not* familiar with the field of your research.

You are required to prepare and rehearse your presentation at least one week before you give it. The rehearsal should be to your project/essay/PhD supervisor and, where appropriate, to other members of the class or your research group. You should listen carefully to any feedback given at the rehearsal and revise your presentation accordingly.

In addition to giving your own presentation, you will be asked to attend and assess the presentations of a small number of your classmates. Your attendance and the submission of your assessments will count a small proportion of your total mark.

More detail will be given closer to the time.

Submit any slides and any script that you use.

Submit your assessment of the other presentations.