Research Skills

Advanced MSc and PhD Students

http://www.cs.bham.ac.uk/~jxb/rs.html

Lecturer: Dr. John A. Bullinaria

http://www.cs.bham.ac.uk/~jxb

Aim of the Research Skills Module

To provide the student with the basis of transferable knowledge and skills necessary for a successful research-oriented career in industry or academia, with a particular orientation to computing-based disciplines.

Outline of its Content

This module covers research skills that fall into two main areas:

- Transferable skills, such as document preparation, report writing, oral presentation, work management, and intellectual property rights.
- Information skills, such as retrieving and recording bibliographic information from manual and computerised sources.

Learning Outcomes

On completion of this module, the student should be able to:

1. Understand modes of communication in the computing sciences.
   (For example, know how research results are disseminated.)

2. Appreciate the structure of the literature of the computing sciences in general and a chosen research field in particular.
   (For example, know where to look for research literature.)

3. Methodically search the literature to investigate a research topic.
   (For example, be able to carry out an effective literature review for your chosen research area.)

4. Make effective presentations both orally and in writing.
   (For example, be able to write conference papers and give talks.)

Module Structure

Three lecturers for the price of one:

John Bullinaria (Module Lecturer) = JB

Andrea Soltoggio (Teaching Assistant) = AS

Chris Bowers (CERCIA Research Fellow) = CB

Two contact hours per week for eleven weeks of Autumn Term:

16 Traditional lectures (L1-16)

6 Sessions of student presentations, discussion and feedback

For PhD students, more early in the Spring Term:

~4 Sessions of student presentations, discussion and feedback

Syllabus / Lecture Plan

Week	Tuesdays 3:00-4:00pm	Thursdays 2:00-3:00pm
1	Introduction to Research Skills (JB)	Literature Searching (AS)
2	Computer Aided Searching (AS)	Further Search Techniques (AS)
3	Document Preparation and LaTeX (CB)	Using LaTeX and BibTeX (CB)
4	LaTeX Software and IDEs (CB)	LaTeX Stylesheets, Tables and Figures (CB)
5	Continuous Assessment Specification (JB)	Writing (AS)
6	Writing Abstracts (AS)	Citing and Referencing (AS)
7	Presentation Skills (AS)	Preparing Slides and Posters (AS)
8	Work Management (AS)	Intellectual Property Rights (JB)
9	Student presentations, discussion, feedback (JB)	Student presentations, discussion, feedback (JB)
10	Student presentations, discussion, feedback (JB)	Student presentations, discussion, feedback (JB)
11	Student presentations, discussion, feedback (JB)	Student presentations, discussion, feedback (JB)

Content Preview: Literature and Searching (L2-4)

The main forms of research dissemination

The structure of the literature for Computer Science

Indexes, abstracts, citation indexes, …

Quality and currency of different forms of literature and indexes

Copyright Libraries and Inter-Library Loan

Paper and electronic journals

Searching the literature

Formulating a search strategy

Computer aided literature searching

Tools: Science Citation Index, Google, CiteSeer, …

Content Preview: Document Preparation (L5-8)

MS Word v. LaTeX v. …

Introduction to TeX and LaTeX

Basic formatting commands

Using BibTeX for references

Equations

Creating tables and embedding figures

Putting together large documents (e.g., theses)

Using style-sheets

Software and LaTeX Development Environments

Sources of further information

Content Preview: Writing and Presentations (L10-14)

Basic writing skills

Planning and structure

Style

Grammar and spelling checkers

Writing abstracts

Citing, quoting and referencing

Plagiarism

Oral presentation skills

Preparing slides for talks

Preparing poster presentations

Content Preview: Work Management (L15)

Time management

Planning, lists and Gantt charts

Effective use of time

Effective supervision

Procrastination, perfectionism, interruptions, …

Being organised

Working as a team

Project management

Version control

Wiki

Content Preview: Intellectual Property Rights (L16)

What is Intellectual Property?

IPR legislation

Copyright

Moral rights

Patents

Trademarks

Plagiarism

WWW issues

Valuation of intellectual property

Case study discussions

Recommended Books

Title	Author(s)	Publisher, Year	Comments
Essential Communication Strategies: For Scientists, Engineers and Technology Professionals	Herbert Hirsch	Wiley, 2003	Provides the tricks of the trade for becoming a great technical communicator
LaTeX: A Document Preparation System	Leslie Lamport	Addison-Wesley, 1994	Standard text-book on how to use LaTeX
The Chicago manual of style (14th ed)s	-	University of Chicago Press, 1993	Guide to preparation of papers and reports, including referencing
MLA style manual and guide to scholarly publishing (2nd ed)	Joseph Gibaldi	Modern Language Association of America, 1998	Guide to preparation of papers and reports, including referencing

None are essential for this module. The first two are in the School Library and are well worth looking through at some point. Owing a book on LaTeX will probably prove to be a worthwhile investment for most students.

Assessment

The module assessment has two parts:

- An oral presentation (worth 35% of the final mark)

  The task is to give a talk (10 minutes for MSc students, 15 minutes for PhD students) on the topic of your current research interests, using a series of slides suitable for display via a laptop driven data projector.

- A written report using LaTeX (worth 65% of the final mark)

  The task is to produce a report (of not more than 5000 words) that: describes how you carried out a literature review for your chosen research topic, provides a summary of your review, and outlines your work management approach.

A full description of what is required, marking criteria, deadlines, and so on, will be provided in L9 (Week 5).