

MPhil in Computational Biology

Course Guide

2011–12

September 5, 2011

Course Director	Professor Simon Tavaré DAMTP University of Cambridge Telephone: 01223 760420 Email: S.Tavare@damtp.cam.ac.uk
Co-Director	Dr. Stephen Eglén DAMTP Telephone 01223 765761 Email: S.J.Eglen@damtp.cam.ac.uk
Course Administrator	Danielle Stretch DAMTP Telephone 01223 760414 Email: D.Stretch@damtp.cam.ac.uk

Subject to revision

This brochure is online at <http://www.ccbi.cam.ac.uk/Education/MPhil/>

Contents

1	PEOPLE AND CONTACTS	3
1.1	Biographical details	4
2	CALENDAR	5
2.1	Use of audio/visual recording equipment in lectures	5
3	MODULE SUMMARIES FOR MPhil IN COMPUTATIONAL BIOLOGY	6
3.1	SP — Scientific Programming with R	6
3.2	GI — Genome Informatics	6
3.3	FG — Functional Genomics	6
3.4	CN — Computational Neuroscience	7
3.5	GSA — Genome Sequence Analysis	7
3.6	SG — Structural Biology	7
3.7	SB — Systems Biology	7
3.8	NB — Network Biology	7
3.9	EX — End of year examination	8
3.10	Seminar in Computational Biology	8
4	INTERNSHIPS	9
4.1	Is it possible to arrange my own project?	9
4.2	How do I go about arranging my internship?	9
4.3	How are the projects examined?	10
5	ASSESSMENT AND MARKING	11
5.1	Submission of coursework	11
5.2	Managing coursework deadlines	11
5.3	Camtools	11
6	PLAGIARISM	13
7	STUDENT FEEDBACK PROCEDURES	14
8	INFORMATION ABOUT THE DEPARTMENT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS	15
8.1	Computing facilities in DAMTP	17
8.2	Getting started on PWF LINUX	19

1 PEOPLE AND CONTACTS

(in alphabetical order)

STAFF

Dr. Stephen Eglén	Lecturer	G0.05	65761
Dr. Julia Gog	Lecturer	G0.15	60429
Professor Ray Goldstein	Professor	H0.06	37908
Dr. Gos Micklem	Director of CCBI	G1.19	60447
Ms. Danielle Stretch	Administrator	G0.14	60414
Professor Simon Tavaré	Professor; Course Director	G0.06	60420

Contacts

MPhil Administrator	compbio@damtp.cam.ac.uk
All MPhil Students and MPhil Administrator	Maths-cbphil-students@lists.cam.ac.uk
Course wiki	http://www.ccbi.cam.ac.uk/Education/MPhil/students2010
Coursework submission	http://www.camtools.cam.ac.uk

1.1 Biographical details

Professor Simon Tavaré

Simon joined the Department of Applied Mathematics and Theoretical Physics in January 2004 and is the Course Director for the MPhil programme in Computational Biology. He is also Professor of Cancer Research in the Department of Oncology. Simon received his PhD in probability and statistics from the University of Sheffield, UK in 1979. His research has focused on statistical and probabilistic problems arising in molecular biology, human genetics, population genetics, statistical genetics, molecular evolution and bioinformatics.

Dr. Julia Gog

Julia's first degree was mathematics at Cambridge, followed by Part III mathematics, then PhD and college Research Fellowship in the Department of Zoology, Cambridge studying pathogen population dynamics. She became a Royal Society University Research Fellow in 2004, and returned to DAMTP in October 2006 to become a University Lecturer. She is a fellow of Queens' College and has a research group in DAMTP researching disease dynamics. She is associated with the Cambridge Infectious Diseases Consortium (CIDC) and collaborates closely with a number of lab biologists in Cambridge and elsewhere. Her work aims to bring together experiments and theory in a number of systems: influenza (avian, equine and human), salmonella, and campylobacter. She is interested in understanding key mechanisms in disease dynamics, both at the individual and population level. In influenza, a particular theme is the interplay between disease evolution and population dynamics.

Dr. Stephen Eglén

Stephen gained his first degree in Cognitive Science at Nottingham. His PhD from Sussex was in the area of Computational Neuroscience, examining the role of spontaneous neural activity upon development of nerve connections in the visual system. In his postdoctoral work at Edinburgh and Washington University at St. Louis, he mostly studied the development of the structure and function of the vertebrate retina. Stephen joined the Department of Applied Mathematics and Theoretical Physics in June 2004.

Ms. Danielle Stretch

Danielle has had a varied career working for visual artists, writers, politicians and academics. She has been working in the higher education sector since 1990 and joined the Department of Applied Mathematics and Theoretical Physics in 1992. Her previous job was as Events Administrator for the Millennium Mathematics Project, an education outreach project which promotes the public understanding of mathematics. She started work as the Course Administrator for the MPhil in Computational Biology in January 2004.

2 CALENDAR

The MPhil in Computational Biology is a full time Masters degree taught over an 11 month period from October to August. During this time students are required to be resident in Cambridge and will be expected to participate in activities outside the periods of Cambridge Terms (which are set largely for the delivery of undergraduate programmes). Please see the BGS regulations regarding terms of residence, in particular “you need to be in Cambridge for three quarters of the total nights of each term”:

<http://www.admin.cam.ac.uk/offices/gradstud/current/procedures/term.html>

Most formal lectures will take place during the University Terms, the dates of which are:

MICHAELMAS	Tuesday 4th October	Friday 2nd December
LENT	Tuesday 17th January	Friday 16th March
EASTER	Tuesday 24th April	Friday 15th June

Course lectures start on the first Thursday following the Tuesday that starts the term. Lectures are held in *the Centre for Mathematical Sciences*, unless otherwise stated. The timetable will be given out during term.

The exam will be held sometime in April/May 2012, after which the internships will start. The Internship will run until the end of August when you will be asked to submit your report and give a presentation based on your project. You are expected to be in Cambridge until the last day of the course which is August 31st 2012.

2.1 Use of audio/visual recording equipment in lectures

The use of audio/visual recording equipment (e.g. ipods, cell phones) in lectures is not permitted without the prior consent of the lecturer. If you have a particular need to record lectures, other than taking notes, please contact Stephen or Danielle.

3 MODULE SUMMARIES FOR MPhil IN COMPUTATIONAL BIOLOGY

Preterm	Michaelmas Term	Lent Term	Easter Term/Summer
Molecular Biology & Statistics	Genome Informatics Structural Biology Computational Neuroscience Scientific Programming with R	Systems Biology Network Biology Synthetic and Executable Biology Genome Sequence Analysis	Exam Internship

The module list, and the module weighting, is:

module	abbrev	weight
Scientific Programming with R	SP	1
Genome Informatics	GI	1
Structural Biology	SB	1
Computational Neuroscience	CN	1
Genome Sequence Analysis	SA	1
Methods & Models in Genomics	MMG	1
Synthetic & Executable Biology	SEB	1
Systems Biology	SYB	1
Network Biology	NB	1
Examination	EX	1
Internship		3
Total modules		12

3.1 SP — Scientific Programming with R

Stephen Eglén (DAMTP)

Interactive use of R. Basic data types. Writing scripts. Graphical facilities. Writing your own functions. String processing. File input/output. Vectorization. Numerics issues. Debugging. Introduction to Monte-Carlo methods. Reproducible research. Interfacing to databases. Advanced aspects.

3.2 GI — Genome Informatics

Gos Micklem (Genetics/CCBI) and Boris Adryan (CSBC) et al

Introduction to genome sequencing, assembly, annotation, visualisation. Computational approaches to sequence assembly; sequence alignment; automated gene finding; functional annotation (Gene Ontology, PFAM, etc.); physical mapping and genome variation; sequence, gene annotation and gene variation databases.

3.3 CN — Computational Neuroscience

Stephen Eglén (DAMTP)

Introduction to the nervous system: how neurons encode and decode information. Hodgkin-Huxley models of action potential propagation. Introduction to network-level models. Associate networks for long-term storage. Supervised learning methods. Reinforcement learning methods. Unsupervised learning methods. Application of techniques to understanding visual system development.

3.4 GSA — Genome Sequence Analysis

Aylwyn Scally, (Sanger)

The course will introduce hidden Markov models, their properties, implementation and application to some important problems in bioinformatics and genomics. Topics: probabilistic models; Markov chains; inference on Markov chains; hidden Markov models; the forward-backward algorithm; inference with HMMs; the Viterbi algorithm; Baum-Welch training; sequence alignment; Markov models of sequence evolution; inference on trees; applications of HMMs in population genetics and evolutionary genomics.

3.5 SG — Structural Biology

Ilka Mueller, Peter Bond and Michele Vendruscolo (Chemistry)

Introduction to Structural Biology: Structure and function of proteins and nucleic acids, Experimental techniques for protein structure determination (X-ray crystallography, NMR, etc), Protein structure prediction, Energy minimization and molecular dynamics, Protein folding and aggregation, Membrane proteins, Protein-protein interactions, Structural biology in drug discovery.

3.6 SB — Systems Biology

Johan Paulsson and Andreas Hilfinger (Harvard Systems Biology)

Detecting regulatory networks. Inverse engineering. Scale-free networks. Modeling frameworks: Boolean logic, deterministic rate equations and stochastic processes - analytically and computationally. Kinetic design principles, e.g feedback loops, metabolic phase transitions, multi-stability, and order versus disorder. Systematic kinetic approaches, e.g. metabolic control analysis and biochemical systems theory. Biological model systems, e.g. the lac operon, phages, plasmids and chemotaxis. Single cell and single molecule experiments. Synthetic biology.

3.7 NB – Network Biology

Florian Markowetz (CRI, CRUK) & Lorenz Wernish (MRC, BSU)

Introduction to Network Biology: Biological networks. Topological properties. Network models from dynamic data; Mathematical models: relevance networks, graphical gaussian models, Bayesian networks. Modelling gene regulatory networks. Metabolic networks. Further statistical tools: factor-analysis, independent component analysis, model selection criteria. Models of altered pathways in human cancer. Genotype-disease network models. Network analysis of gene perturbation screens: Perturbations and phenotypes, Exploratory analysis: enriched gene sets and sub-networks, Probabilistic graphical models and Bayesian networks, (Non-) linear Multiple-input Multiple-Output models, Nested Effects Models, Genetic interaction networks.

3.8 EX — End of year examination

There will be a two hour written examination at the end of the taught part of the course. You may be asked to answer questions based on any of the above material.

You are allowed to bring a calculator into the exam room but it must be an approved model. We will give suitable notice if a calculator is needed for the examination this year.

3.9 Seminar in Computational Biology

There will be a seminar each week on a particular research area in computational biology during Lent Term. There will be other seminars on an ad hoc basis during Michaelmas Term

Wednesday, 2–3pm during Lent Term

Each week a researcher from Cambridge (either within the University, related academic sites or from local industry) will speak for an hour on their research followed by a group tea. A diverse range of speakers from across the spectrum of Computational Biology have been selected to demonstrate the wide range of application areas, particularly those areas that are not covered by the other modules.

Seminars are compulsory and you are expected to attend each week. Their aim is to provide you with potential opportunities and resources that may not be provided in the other modules. In particular it provides an opportunity to meet local researchers who may well have research positions they want to fill be it summer internships or PhD posts. You will be asked to help run the seminar programme, details will be posted on the wiki.

4 INTERNSHIPS

You will spend the last three months of the course (during June, July and August) working on an research project based in a company, other academic institution (such as the EBI or Sanger) or in another department of the University of Cambridge.

The internship is a very important part of the course as it will give you the chance to do some original work and to make contacts that may be useful to you when going on to do a PhD or to find work. Those who are looking for a job after the end of the course may find a company project particularly useful as this will provide you with a reference and relevant work experience. The internship is weighted as three modules towards your final result.

We will compile a file of potential projects on offer. These will give you brief details and you are encouraged to follow-up potential projects that interest you. Please remember that details of the company projects are often necessarily sketchy because they may involve commercially sensitive material.

We will also have company representatives or academic staff visiting the department to discuss potential projects in more detail with you. You are encouraged to attend these in order to have a chance to meet the people who will be supervising you and to find out more about the potential project.

What is the difference between a company project and an academic one?

There is not necessarily a great dividing line between the two. Some of the companies regard these projects as being academic as you will be based in the department and have both an academic and a company supervisor. These are often more open-ended and speculative projects and are open to further development.

Other companies expect students to be based on site and see the support and facilities that they can provide whilst you are working there as an important part of the experience.

You may find that the company asks several interested students to attend for an interview and then offers the project to the person who they think has the most relevant skills. We hope that you will think of this as a useful experience even if you are not the person who is chosen for a particular project!

4.1 Is it possible to arrange my own project?

Yes, we encourage you to follow your own interests. There is one proviso; you must discuss details of any self-directed project with the course director first and you *must* have his approval before going on to make any definite arrangements.

We are happy for students to try to arrange a project which is in the same field as their future PhD and for this period to be, informally, the start of their doctoral study.

4.2 How do I go about arranging my internship?

We will have a meeting during the Lent Term to discuss the internships and to start the process of allocating students to projects. We have found that, because this is a conversion course, that it takes at least the first term for many students to know what field they wish to pursue. Some students from the previous year's intake will also attend the meeting and describe their own experiences of undertaking a project. You will be welcome to ask them questions and we hope that you will find this useful.

Please remember that when you are contacting a company or university that you are representing not only yourself but the course and the University of Cambridge. It is absolutely essential that any contact is made in a professional, polite and businesslike manner. If you

are unsure about contacting a company or institution then please ask the Course Administrator for help and she will do this on your behalf.

4.3 How are the projects examined?

We will ask your company or academic supervisor to write a report on your progress during the internship. We will also ask you to write a report which you have to hand in a week before the end of the project. You will then be asked to give an oral presentation describing your work. Your presentation files (e.g. powerpoint or PDF file) will also need to be submitted in advance of the talk. The internship report is worth 2.5 modules, and the presentation is worth 0.5 modules.

The exact nature of this report will vary according to your internship, but it should take the format of a dissertation, normally taking the following format:

- Chapter 1 - introduction/aims/literature review
- Chapter 2 - your work (possibly broken down into more than one chapter).
- Chapter 3 - conclusions / future work
- References
- Appendices - for any extra material (e.g. code snippets, detailed derivations) that you wish to be included for future reference, rather than necessarily to be read by the examiner.

The report should be no more than 18,000 words, which means that your report should be no more than around 36 pages (at 500 words/page, but that assumes no figures). This word limit excludes the bibliography and appendix. Please note this is an *upper* word limit — writing a short clear report is much better than a long report padded with text to reach the upper word limit. Please write the word count on the front page of the report.

For your presentation, you will be required to submit your electronic files (PPT/PDF/Keynote) the day before presentations begin. Each talk is expected to last 20–25 minutes, with five minutes for questions. You will be expected to keep to time, as we have many presentations. We strongly advise that you arrange to give several practice talks (e.g. to your colleagues, or host lab) as experience has shown that people who practice give better talks.

5 ASSESSMENT AND MARKING

We will use the following marking scales to evaluate your work on each module.

Grade A	75–100%	Excellent
Grade B	65–74%	Good
Grade C	60–64%	Satisfactory
Grade D	50–59%	Borderline fail
Grade F	Under 50%	Fail

Your final pass mark will be based on your average score from *all* the modules you have taken (including the three modules which are awarded for the project). To pass the course, your average score must be 60% or over. Those scoring over 75% will be awarded a distinction.

5.1 Submission of coursework

The modules for this course (with the exception of the internship) are assessed by coursework. The work for each module must be submitted in the manner specified by the lecturer in charge of the course. All coursework is to be submitted electronically as PDF files, to Camtools, see below. Presentation of your work is important and will be taken into account when marking your assignments. *No handwritten work will be accepted. Do not scan in handwritten work and submit it as a PDF.* Please keep a reference copy of any work submitted.

Extensions If any work is submitted after the deadline without clear mitigating circumstances, it will not be marked, and you will be awarded zero for that coursework. Students seeking a delayed submission on illness or serious personal grounds must obtain a supporting letter from their College Tutors to the Course Director setting out the grounds for the delay and proposing a revised submission date. Whenever possible, this procedure must be carried out before the original submission date.

5.2 Managing coursework deadlines

If you are feeling overloaded and cannot hand in your coursework on time then please do not panic! We would prefer you to hand in work that is incomplete rather than failing to meet the deadline. This may seem harsh but we have found that giving general extensions to deadlines can compound the feeling of being overloaded because the other coursework deadlines then start to overlap. When a particular task proves difficult for many students then we will take this into account when marking the work. If there is a general sense of being overloaded or other difficulties with coursework then please ask your course representative to come and speak to us about this.

You may find that particular elements of the course are difficult. Please let us know if this is the case.

5.3 Camtools

Camtools is the coursework submission system. All coursework, unless asked for otherwise by the lecturer, should be submitted to the Camtools system. Each assignment will have a folder with Camtools where you can upload your work. It automatically notes the time of submission, and refuses uploads after the deadline.

Unless explicitly requested otherwise, upload only one file, which should be a PDF. Do not upload other formats, e.g. Word documents, unless requested. Please do not scan in

handwritten notes and submit them as a PDF, as they will not be accepted. In previous years, some users of Microsoft Word on Windows submitted PDFs that were not printable from Unix machines — this is normally a problem with the PDF not including the fonts that you were using on your machine. We strongly encourage the use of LaTeX, as this generates high-quality portable documents.

When submitting your document, we strongly recommend that you use a meaningful filename, rather than just “report.pdf”. Include your CRSid and the abbreviated assignment name and number. This helps us easily see your username from the filename, rather than having to open the file. For example, if user ‘xyz20’ was submitting Functional Genomics Assignment 1, his/her file would be called: xyz20_fga1.pdf.

Camtools is available via <http://camtools.cam.ac.uk>. Login via Raven and then you should be able to see the MPhil coursework submission site, entitled “MPhil Comp Bio 10_11”.

6 PLAGIARISM

We take plagiarism very seriously. For a definition of plagiarism, and some helpful tips on avoiding it, please read the advice from the Board of Graduate Studies, at <http://www.admin.cam.ac.uk/offices/gradstud/current/submitting/plagiarism.html>. Furthermore, the Mathematics faculty offer more specific guidelines at <http://www.maths.cam.ac.uk/teaching/plagiarism.html>. For your benefit, a copy of both items follow. Please read these notes, and if in any doubt, ask for advice.

7 STUDENT FEEDBACK PROCEDURES

We encourage feedback from students on all aspects of the course. This helps us assess how well the course is currently running, and will help us to correct any current limitations. Anonymous feedback forms will be distributed at the end of each module, and we highly encourage you to complete the form.

In addition to this formal mechanism, we also encourage informal feedback at any time. If you face any difficulties with the course, the sooner we know about them the sooner they can be addressed. Please feel free to contact any of the teaching staff on the course, the course administrator or the course director and we hope we can resolve your comments and enquiries in a timely manner.

Your comments regarding the course will be highly valuable to us in evaluating the content and direction of the course. As this area of computational biology is rapidly evolving, we expect to evaluate the content yearly to ensure that our students receive the best education possible in this field.

Course representative

Once you have had time to get to know one another we will ask you to elect a fellow student (or two) as a course representative. The role of the course representative is to provide feedback to us on any issues regarding the course, such as coursework and teaching.

Weekly tea

Every Wednesday during Lent term we hope that you will join us for tea in the Pavilion G Common Room after the seminar. This is a chance for you all to meet as a group, and chat with members of staff.

8 INFORMATION ABOUT THE DEPARTMENT OF APPLIED MATHEMATICS AND THEORETICAL PHYSICS

Overview

DAMTP is one of two departments in the Faculty of Mathematics; the Department of Pure Mathematics and Mathematical Statistics (DPMMS) occupies Pavilions C,D and E on the CMS site. The Faculty is part of the School of Physical Sciences.

DAMTP is an unusually large department for its discipline with currently around 50 established academic posts (professors, readers, lecturers, assistant directors of research) and just under 100 contract research staff. In addition, there are approximately 110 postgraduate research students and around 200 graduate students taking the Certificate for Advanced Study in Mathematics (Part III of the Mathematics Tripos). The Department achieved the highest possible grades in each of the four-yearly Research Assessment Exercises, and 14 members of the faculty have been elected as Fellows of the Royal Society.

Information about the Department

Bicycles

There are cycle racks at several points around the CMS site – please use these. A good lock is a necessity, or the bike will be stolen. Cycles are not allowed inside the buildings or inside the courtyard between the Gatehouse and Pavilion A.

Cars

Unless you are registered disabled (and even then a place cannot be guaranteed) you will not be allocated parking.

Catering Facilities/Common Rooms

The central dining facility is open from 09:00 to 16:00 for snacks, light lunches and coffee/tea. Outside these hours there are coffee machines in the common room in each pavilion and vending machines in Pavilion A. Each pavilion has its own common room with fridge, microwave and coffee machine and milk and sugar are provided.

Disabled students

The building is suitable for disabled use but please contact Mick Young (66915) for advice on detailed access requirements.

Electrical equipment

All portable electrical equipment that is brought into the Department must be checked by Mick Young (see above) before it is used.

Expenses

Standard expenses (such as postage, phone, photocopying, fax, stationery etc.) are not normally charged for, but must be work-related. This policy is possible only if it is not abused, e.g. people do not make long national phone calls (note that phone calls are automatically logged). Please try to avoid making personal phone calls but if these are essential then contact John Turner and let him know how you would like to be billed.

Faults

Report faults in your own room (e.g. radiator or lights not working) to Mick Young or email the Facilities staff at facilities@maths.cam.ac.uk. Serious faults out of hours (e.g. lighting or door locking failures) should be reported to Security (31818).

Fire Safety

In the event of a fire alarm, please leave the building by the nearest exit and do not return to the building until advised to do so.

The external doors do not open automatically for security reasons; exit in the normal way. Assembly points are shown on posted site plans and Fire Wardens will direct you. Do not attempt to enter another building if an alarm is sounding there also.

First Aid

First Aiders are summoned via Reception (65000).

If an accident occurs outside normal office hours, telephone Security on 31818. The emergency number for **FIRE, POLICE or AMBULANCE is via Security on 101, or 1999 on any network phone**. If you do have an accident, please ensure that you complete an accident form.

Insurance

The University is not insured for *theft* or damage to your personal property while you are on University premises, so if you bring a computer with you then you should take out insurance for it. The University is insured for accidental personal injury to staff, students and visitors whilst they are on University premises *but only where the accident was due to a fault on the University's part*.

Mail/fax services

Mail and fax are placed in the pigeonholes, which are on the ground floor of Pavilion A, near to Reception. Your mail will be put in the MPhil-student pigeonhole.

Outgoing mail should be placed in the trays in Reception before 16:00 on weekdays. A University Messenger Service (UMS) circulates between the University's departments and Colleges. Internal mail is collected by the UMS daily and needs to be in the trays in Reception by 11:30 in order to be collected that day. There are no mail services at weekends. Please ask Reception if you have any queries. Faxes can also be sent from your computer via the Internet, which avoids queueing for the fax at busy times – instructions are available on the DAMTP web page.

Money

John Turner, the departmental accountant, (Room B1.27) deals with all aspects of departmental finances including the administration of studentship awards. If you need to claim expenses then you are required to produce receipts for all items and to pass these and a completed departmental expense claim form to John Turner, the departmental accountant, who will reimburse you.

Safety

The Safety Officers are Dr. S. Dalziel (37911) for the Laboratory and Mr. Mick Young (66915) for the rest of the CMS site. It is important that all members of the Department staff observe safe working practices and inform the Departmental Safety Officer or the Departmental Administrator, Mrs. Ann Mobbs (37863), if they see anything giving them causes for concern.

Reports of Accidents and Incident should be made to Reception in the first instance where suitable forms for the purpose can be obtained.

Security

Individual pavilions are usually locked but visitors and undergraduate students may enter via Reception (open from 08:30 to 17:30 weekdays and 08:30 to 13:30 on Saturdays in term time). Door should not be held open, or the alarm will sound.

Do not let strangers without keys/entry cards into the buildings and do not move computers without contacting the Computer officers.

Seminars

Lists of forthcoming seminars within DAMTP, DPMMS and the nearby Isaac Newton Institute for Mathematical Sciences are pinned on to the noticeboards and on the departmental web-pages. They are also displayed on LCD screens throughout the department.

Our seminars are also listed on the Computational Biology website. Many Cambridge talks are now listed on <http://talks.cam.ac.uk>.

Smoking

There is a No Smoking policy applied to all buildings in the CMS.

Stationery

Please help yourself to stationery from the stationery store which is on the lower ground floor of Pavilion B (Room BL.15). You will need a key for this and this can be obtained from either Reception or the Faculty Office (Room B1.29). If you need items which are not in stock please go and speak to the Course Administrator.

The University Computing Service

The University of Cambridge Computing Service provides a helpdesk service and runs IT training courses on a large variety of subjects. They also sell some software at educational discount. You can find out further information about the computing service on their website at <http://www.cam.ac.uk/cs>

8.1 Computing facilities in DAMTP

MPhil COMPUTING FACILITIES - PWF-MATHS

Thirty PCs connected to the University Public Workstation Facility network (PWF) are available for use by MPhil students in the Teaching Computer Room (GL.04). The computers are “dual-boot” which means they can be started up to run either Microsoft Windows or linux. Windows is used by undergraduates and is the default; linux is used for running the MPhil course software. To start up linux from Windows, press **Ctrl+Alt+Delete** to display the log-in window, select **Shutdown** and restart the computer, then select **linux** from the boot menu.

The following software is available using both linux and Windows: the emacs editor; TeX and LaTeX for writing reports; email software (pine); Web browsers; gcc (a C/C++ compiler). Windows computers have Microsoft Office installed.

Many colleges have similar facilities and the University Computing Service (UCS) operates public PWF rooms on the New Museums Site. User files are stored centrally on Computing Service file servers and can be accessed from computers at all PWF sites and many of the colleges. Note that PWF computers cannot be accessed using remote login from other sites.

Computer accounts

PWF computer accounts and passwords are administered by the Computing Service. Students who are new to Cambridge should receive details of their account from the Computing Service. Students who did the Cambridge Tripos course may need to ask Computing Service Reception to re-activate their account if it was closed down during the summer vacation.

Most computer systems at Cambridge will use your CRSid (Common Registration Service identifier) as your login name. The CRSid is issued by the University Computing Service and used to identify a person on any computing system managed by the University Computing Service, including Raven, Hermes and the PWF. It is also used as a login name on many computing systems managed by other University Institutions. In particular, the CRSid forms part of a user’s @cam email address.

The CRSid is generated from the initials of the person, although not all initials are always used and should a person change their name, the CRSid normally remains the same. So a Cambridge user Arthur Brown might have CRSid AB999 and his @cam email address would be AB999@cam.ac.uk.

You should be able to get your PWF passwords either by visiting <https://jackdaw.cam.ac.uk/signup/> or by logging into a PWF machine with the username “signup”. You will need your CRSid (if known, else use your surname), your date of birth and your admissions reference code.

(This information on CRSid has been copied from <http://www.cam.ac.uk/cs/instdadmin/crsid.html>).

Email

Your CRSid will be needed to access your email at: <https://webmail.hermes.cam.ac.uk>.

Laptops

If you have a laptop, you can connect it to the internet using the orange ethernet cables within the department. (There are many such ports enabled in the MPhil room.) To access the internet, you will need to start a web browser; when you first visit an external web page, you will be asked to authenticate. Use “Raven authentication” to continue. You will remain authenticated whilst your browser remains open. Raven is also used for authentication to the Wireless service that is available around the CMS.

Printing

MPhil students are given a free allocation of printer credit for use on the PWF-MATHS printers at CMS. PWF-MATHS credit cannot be spent on UCS or college printers. Similarly, credits purchased at the UCS or in college cannot be used at CMS. If you run out of printer credit send an email to help@maths.cam.ac.uk. You may be asked to explain why the standard allocation proved to be insufficient.

Printing facilities are provided solely for academic use. Please use other printers in college or at the UCS for personal use. Note that non-academic use of printers, or unnecessary waste of paper (including large amounts of output left uncollected), may result in a charge being made.

Getting Help

Further information about MPhil computing facilities and the PWF is available at <http://www.cam.ac.uk/localuseronly/cs/pwf>

Please email requests for assistance and any other comments to the Faculty Computer Officers at help@maths.cam.ac.uk.

Rules for use of MPhil computing facilities

Users of the PWF network are subject to the rules of the University Information Technology Syndicate:

<http://www.cam.ac.uk/cs/rules/>

You must read this information when you first start to use the PWF network.

Note in particular that:

- PWF accounts are issued for use by a single individual. You must not log in using another person’s login name, or allow any other person (including friends or family) to access facilities using your login name.
- Computer hardware should be used carefully and left in a condition fit for others to use. **Do not switch computers off.** Please report all faults immediately to help@maths.
- Equipment should not be moved or connected to the network without prior authorisation.
- Information belonging to other users is confidential. You must not read, access or modify any file not owned by you without the explicit permission of the owner.
- Proprietary software must be used correctly in accordance with licensing conditions and must not be copied or modified. If you install any proprietary software, including shareware, on PWF computers, you must hold a valid licence. The University or responsible members of staff may be liable to prosecution if unlicensed software is found on any computer. The Computer Officers will delete without warning any illegally-held software discovered on PWF computers.

- Users must always abide by any legislation that applies to the use of computer systems, e.g. Computer Misuse Act 1990, and laws relating to copyright and criminal damage. Storage and use of personal data on computer systems is regulated by the Data Protection Act 1998.
- Games playing is offensive and distracting to others working nearby and is not allowed.
- Users must not **access** any material on the World Wide Web, or other facility which:
 - (a) is libellous, racist, obscene or indecent,
 - (b) is likely or designed to cause offence, inconvenience or anxiety to others.
 - (c) infringes copyright law or any other law (images and sound particularly),
 - (d) is of a character likely to bring the University or Faculty of Mathematics into disrepute.

If you encounter such material by accident you are advised to stop viewing immediately and avoid accessing the site or newsgroup again.

dnh – 2004-08-11

8.2 Getting started on PWF LINUX

At the beginning of the year, to use the COMPBIO software, you should type the following once into a terminal, and then logout and log back in:

```
cp -f $UX/CompBio/bin/00bash_profile ~/.bash_profile
source ~/.bash_profile
```

This will create a folder in your home directory called COMPBIO that will store files (e.g. for assignments) that you will need throughout the year.

There is also a separate folder, /ux/CompBioMPhil, which all of the class should have read/write access to for sharing files on PWF. This will be cleaned in September of every year, so please do not leave files in there beyond the end of the academic year.