INTRODUCTION TO POSTGRADUATE STUDIES IN COMPUTER SCIENCE

Spring 2003

WHAT IS THIS?

Introductory course on the facilities and research skills required for successful graduate study in Computer Science and Engineering.

No-nonsense practical course — NOT a methodology course!

Obligatory for all new postgraduate students (admitted as of 1 Oct 2002 or later) at the Department of Computer Science and Engineering.

WHY AM I HERE? I HAVE MORE IMPORTANT THINGS TO DO.

You have applied & been admitted to the post-graduate programme at the DCSE. This means a *research* education.

There are certain practical skills a researcher *must* have. These are usually taught by hands-on tutoring and/or frustrating practical experiences. This is *unsystematic* and *inefficient* for everyone concerned.

Hence, this course.

Also, the course provides you a way of getting acquainted with your future colleagues & their work. And to learn by comparing their way of doing things to yours.

PRACTICAL ARRANGEMENTS

Lectures: Faculty of DCSE, approx. every other week, Thu 16-18 room T3.

Coordinator: Pekka Orponen (`orponen@tcs.hut.fi`)

Tutorials: Alternate weeks with the lectures. Discussion and practice of topics related to your own research area.

Requirements: Practice talk on a selected conference paper; design and presentation of personal research plan; eight (8) "course points" (lecture attendance = 1 pt, tutorial assignment = 2 pts).

SCHEDULE (L = Lecture, T = Tutorial)

16 Jan/L: Aims, structure and scope of graduate studies (Pekka Orponen)
23 Jan/T: Personal study plan and schedule
30 Jan/L: Use of literature and writing (Jaakko Hollmén)
6 Feb/L: Conferences (Marko Nieminen)
13 Feb/T: Practice presentation of a selected conference paper
20 Feb/T: Practice presentations *cont'd*
27 Feb/L: Archival journals and peer review (Jyrki Kontio)
6 Mar/T: Referee report on a selected paper
13 Mar/L: Research areas and methods in computer science (Lauri Savioja et al.)
20 Apr/T: Personal research plan
27 Mar/L: Funding (Jorma Tarhio)
3 Apr/T: Practice grant/stipend proposal
10 Apr/L: Life after graduation; discussion, feedback (Pekka Orponen)

STRUCTURE OF GRADUATE STUDIES AT HUT/DCSE

MODEL A:

General scientific studies 0–10 cr
Major 25–30 cr
Minor 10–15 cr
Dr. Tech. thesis 115 cr, possibly incl. Lic. Tech. thesis 35 cr

MODEL B:

Major ~25 cr
Minor 1 ~10 cr
Minor 2 ~10 cr
Dr. Tech. thesis 115 cr, possibly incl. Lic. Tech. thesis 35 cr

All courses included must be at postgraduate level (marked "L" or "P" in HUT Study Programme), except possibly those included in Model B/Minor 2.

POSTGRADUATE RESEARCH FIELDS AT HUT/DCSE

Lab. of Computer and Information Science

ZF02 Computer and Information Science
xxxx Language Technology

Lab. of Information Processing Science

ZD14 Software Systems
ZE05 Knowledge Engineering

Lab. for Theoretical Computer Science

ZD06 Formal Methods in CS&E

Lab. of Software Business and Engineering

ZD10 Software Engineering
ZD15 Product Information Technology
ZD11 Usability Research
ZD16 Digital Economy

Telecommunications Software and Multimedia Lab.

ZD08 Telecommunications Software
ZD09 Interactive Digital Media
ZD12 Telecommunications Management
ZD13 Contents Production
ZD17 Business Networks in Digital Economy

Industrial IT Lab.

ZD18 Interactive Environments and Mobile Applications

THREE FORMAL "CHECKPOINTS" AT THE DCSE COUNCIL

1. Postgraduate study application

- Major & minor; prerequisites; advisor(s); preliminary list of courses & study schedule

2. Degree requirements

- Approx. 2nd year of studies
- Conclusive list of courses; dissertation topic

3. Thesis submission

- Proposed reviewers

In addition, there are many little administrative details. (How many copies of each thesis are submitted, by what date, doctoral defence protocol, etc.) Consult the department personnel & your advisor.

MY IDEAL GRADUATE STUDY SCHEDULE (Y.M.M.V.)

Year 1: Coursework & seminars; incl. T-0.050 "Introduction to Postgraduate Studies in CS".

Year 2: Coursework & seminars; initiation of Lic.Tech. thesis (not everyone needs to do this — discuss pros & cons).

Year 3: Seminars; completion of Lic.Tech. thesis; collaborative research.

Year 4: Seminars; ollaborative & individual research.

Year 5: Seminars; individual research & writing up of Dr.Tech. thesis.

COMMON PITFALLS IN GRADUATE STUDY

1. Professor has no time.

- Old system of graduate study student-driven: student got problem from professor, went away, solved problem, wrote thesis, got degree.
- Very inefficient, but low on personnel costs.

- New system: graduate schools, strict deadlines, evaluations, collaborative work.
- Efficient in principle, but does not work satisfactorily with current professor/student ratios & in current academic environment.

- Solutions(?): Do not become too dependent on your professor. Have initiative. Talk to other graduate students & establish external contacts. (Pitfall: strangely, some professors dislike this??)

2. Student has no time.

- Other work and family commitments always take precedence.

- Solutions(?): Set aside regular times for concentrated study & insist on them.

3. "Third year crisis".

- Transition from course work and possible literature survey to independent research can be painful. Research is difficult, slow, and often fails. Many quit in frustration & angst.

- Solutions(?): Have faith. Talk to your professor & other students. Do little things first and big ones will follow. Familiarity with research material & sufficient concentration is almost always eventually rewarded.

HOW TO BE A TERRIBLE GRADUATE STUDENT

(Graeme Hirst, Univ. of Toronto)

- Come to graduate school only because it allows you to postpone your entry to the real world.
- Assume that your advisor acts solely in their own best interests, and never in yours.
- Assume that your advisor (being more than 34 years old) doesn't understand current research, and is not (and never was) as smart as you are.
- Never come to a meeting with your advisor prepared with an agenda of things you want to talk about, and never take notes during the discussion. (After all, little that your advisor says matters, and anyway, if it were important you'd remember it.)
- Never take notes when you read a paper or book, or record any of your ideas in a research diary. (After all, if it were important, you'd remember it.) Corollary: It is not necessary to keep complete bibliographic citations for anything that you read.
* Expect your advisor to give you a thesis topic and tell you exactly how to carry out the work, step by step. Corollary: If your thesis is not going well, it's your advisor's fault, not yours.
- Regard any ideas that your advisor gives you for your thesis as your own exclusive property, and present them to the world as if you alone thought of them.
- Frequently cancel meetings with your advisor, giving little notice (or none at all), whenever there is the slightest excuse to do so.
* Assume that you can write up the final thesis in a month or two.
* Don't bother checking any of your results or proofreading anything you write; that's your advisor's job.

- Regard your graduate education as a 9-to-5 Monday-to-Friday job.
* Give the draft of your thesis to your advisor on a Friday, so that they can read it over the weekend and give you feedback on Monday.

RESOURCES

HUT Handbooks (in Finnish)

Tietotekniikan osaston jatko-opinto-opas
(http://www.hut.fi/Yksikot/Tieto/Opinnot/jatko-opa
M. Airila, M. Pekkanen, *Tekniikan alan väitöskirjaopas.* TKK Hallinto-osaston julkaisusarja 2002/3.

Graduate Studies & Academic Life

P. J. Feibelman, *A Ph.D. is Not Enough: A Guide to Survival in Science.* Addison-Wesley 1993.
J. E. Littlewood, B. Bollobás (Ed.), *Littlewood's Miscellany.* Cambridge Univ. Press 1986.
P. B. Medawar, *Advice to a Young Scientist.* Harper & Row 1981.
E. M. Phillips, D. S. Pugh, *How to Get a Ph.D.: A Handbook for Students and Their Supervisors, 3rd Ed.* Open Univ. Press 2002.

Miscellaneous WWW Resources

`http://lib.hut.fi/Diss/`: HUT Electronic Academic Dissertations

`http://hercule.csci.unt.edu/ian/guides/guides.html`: Ian Parberry's TCS Guides

`http://www.cs.iastate.edu/~honavar/grad-advice.ht`: Iowa State Univ. CS Grad Info Page

`http://www2.phds.org/`: PhDs.org: Science, Math, and Engineering Career Resources

`http://www.rmartin.com/SRC_FAQ.html`: Sci.research.ca FAQ

`http://WilliamStallings.com/StudentSupport.html`: W. Stallings, Computer Science Student Resource Site

`http://www.cs.umbc.edu/csgradinfo/`: UMBC CS Graduate Info Page

FIRST ASSIGNMENT

Due at tutorial next week, i.e. 23 Jan.

Write down your current postgraduate study plan: list of courses, preliminary schedule, possible thesis work. (Submitted to coordinator at tutorial.)

Prepare a 5-7 min introduction to your research area and goals in graduate study for presentation next week. (Max 3 slides.)