INFSCI 3005: Introduction to Doctoral Program

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Parts of this presentation

- Part I: Introduction to this class
  - What we will learn
  - How we will do it
  - What kind of activities

- Part II: The Structure of the IS PhD program at SIS
  - Courses
  - Exams
  - Dissertation

I. Why this Course?

- You are our younger colleagues and we want you to succeed in your studies

- Your success is closely related to the success of this school

- You need to learn how to do research and how to succeed as scientists

- Most scientists learn from their mentors (formal advisors and beyond!)

- But it might be not enough

The Master-Apprentice Model

- Your success (in science but also elsewhere) depends on your hard work, intelligence, but also on your skills.

- A beginning scientist needs to learn how to do research and how to succeed.

- Most scientists learn this from their advisors (the *master-apprentice* model).

- This model is used in every domain that is hard to master.

Scientific Genealogy

- **All scientists in the history of humankind can be organized into a genealogy graph (often, but not necessarily, a tree)**
- **So call all musicians, chess players, sport players**
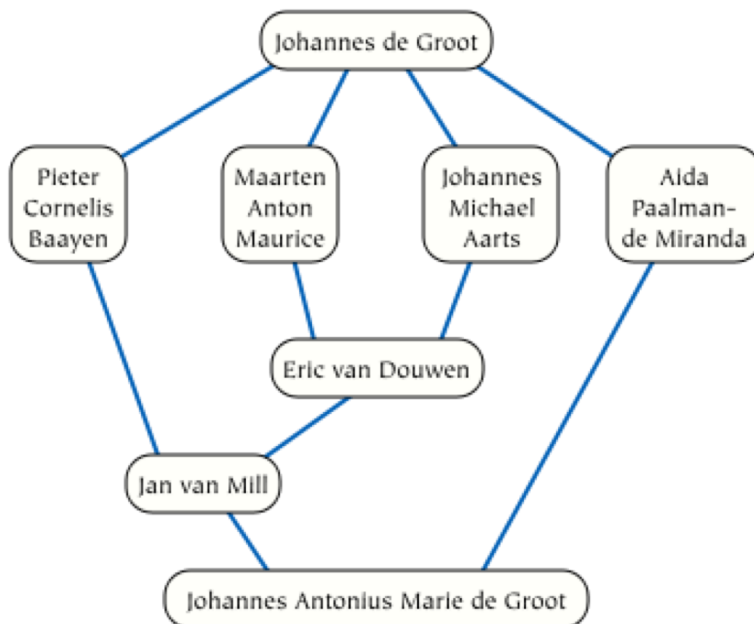
"An example of an academic genealogy, the supervisorial relationship between Dutch topologist Johannes De Groot and his namesake, also a Dutch topologist descended from the senior De Groot via four different paths of academic supervision."

http://en.wikipedia.org/wiki/Academic_genealogy
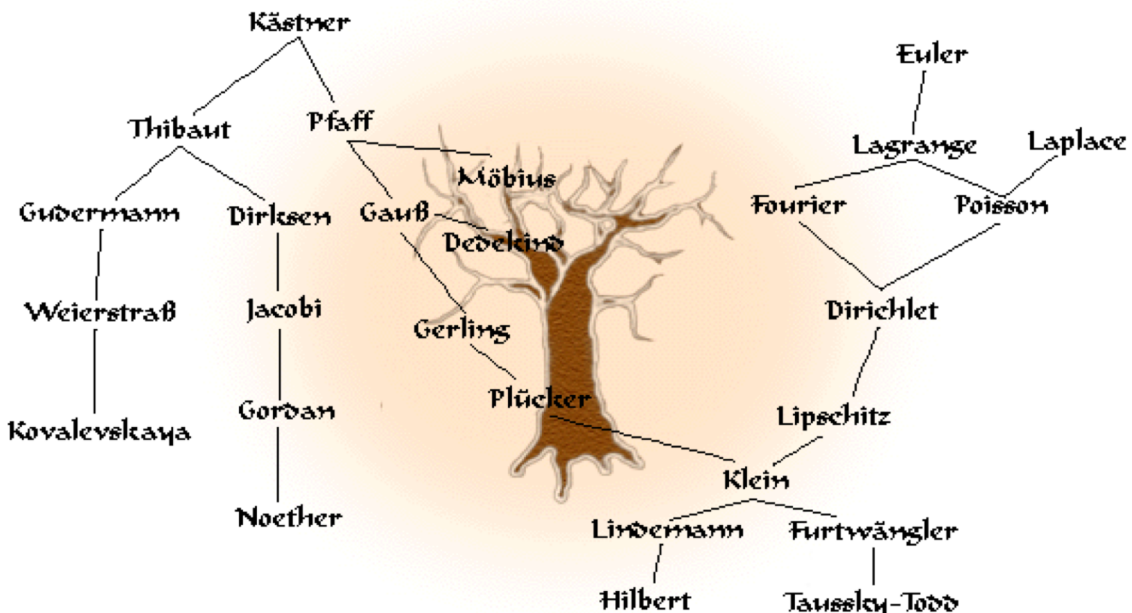
Mathematics

https://genealogy.math.ndsu.nodak.edu

Genealogy in Other Disciplines

Chadwick (the discoverer of the neutron) was a student of Rutherford (discoverer of the proton) who was the student of Thomson (the discoverer of the electron).

The Master-Apprentice model: Pitfalls

- What you will learn depends on the knowledge of your advisor but also on his/her ability to transfer this knowledge.

- But what if you advisor is unable to transfer mastery to you?

- There are otherwise no courses that teach this ☹.

Goals

- Pass a concentrated set of meta-knowledge about PhD, science, academia, research career

- Figure out what you need to learn in the course of your doctoral studies.

- Get started as a researcher as soon as possible
  - Reseach from Year 1

- Defend a strong thesis work

- Succeed in your career!

Skills

- ## What is Science?

  - ### Scientific Enterprise

- ## How to get there?

  - ### What do you need to know to be a successful PhD student?

- ## Science as a career

  - ### What do you need to know to be a successful academic / faculty /researcher

What Do You Need to Learn

1. How does science work?
2. What is research?
3. Identifying good research problems
4. Writing papers
5. Presentation in front of an audience
6. Obtaining funding
7. Reviewing/refereeing the work of others
8. Teaching
9. Guiding students, running a lab, managing projects
10. Scientific creativity
11. Information finding
12. Career planning
13. Interacting with people and networking
14. Marketing your skills: job hunt
15. Balancing your life between work and family
16. Coping with stress
17. Ethics in science
18. Appreciation for quality rather than quantity

AKA: Eighteen fundamental skills of a scientist by Prof. Marek Druzdzel

Scientific Enterprise

- Tell a little about the working of science and the duties of a scientist /academic.

- Review skills that are fundamental to working in a US scientific environment.

  (These skills, are so fundamental to working as a scientist that they are universally useful, no matter where you are on Earth.)

- They should help you with succeeding in <u>any environment</u>!

  (Science is global these days and a scientist does the same thing, no matter where he/she is.)

Being a PhD Student

- Looking around
  - Interesting research direction, ideas
  - How other people do research: learn from example
  - How to find information
- Learning from others
  - Reading, reading, reading
  - Attending research seminars
  - Making most of research conferences
- Advisor: Finding advisor, working with advisor
- Dissertation Committee
- Expectations: Hours of work, publishing, what's critical

Being a Faculty and Researcher

- Research
  - Running your lab
  - Grant hunting
- Teaching
- Service
  - Journal and conference reviewing
  - Conference and workshop organization
  - Professional societies
  - Editorialship
- Special issues
  - Ethics, time management, job hunting, networking...
- Career building

Research

- How to do research: aka *How Science Works*

- Dealing with research literature: finding, citing, reference management

- Doing it
  – Development, data collection, user studies

- Publishing

- Presenting

- Funding

How we will learn it

- Lectures
  - Overview of topics
  - Presentations from faculty
  - Movies
  - Discussions
- Attending Colloquia/Defenses @ Pitt and CMU
- Practice
  - Your own work

Requirements and Grading

- Course attendance

- Reading requirements

- Finding and attending colloquia and PhD defenses

- Reading and presenting a journals paper

- Term project

  - Get research idea, write a white paper and present a grant proposal

- Practicing peer review (White papers /proposals)

- Blog and Home Page

- Pass Pitt Research Certifications (RC, Human Subjects)

Colloquia

- CoMeT System

  - http://halley.sis.pitt.edu/comet

- Find and post 1 colloquium per week

- Attend 1 regular (1-hour) colloquium, PhD proposal defense, or PhD defense per week, write a brief summary in your blog

  - no more than 3 from one series for IS
  - ISP forum is mandatory for ISP, but counts as one
  - at least one real PhD defense (Pitt or CMU)
  - PhD proposals recommended, not required

- Watch for "career" lectures and other relevant talks posted to IS3005 group. Post yourself!

What you will get out of this?

- Generally, as much as you put into it
- The true value of this seminar is in getting you to think seriously about your career.
- You will organize your knowledge of the most important, fundamental skills of a scientist.
- You may feel bored now and then, but …
- If, during each of our meetings, you get one good idea that you will assimilate and use throughout your career, you will have made a great investment.
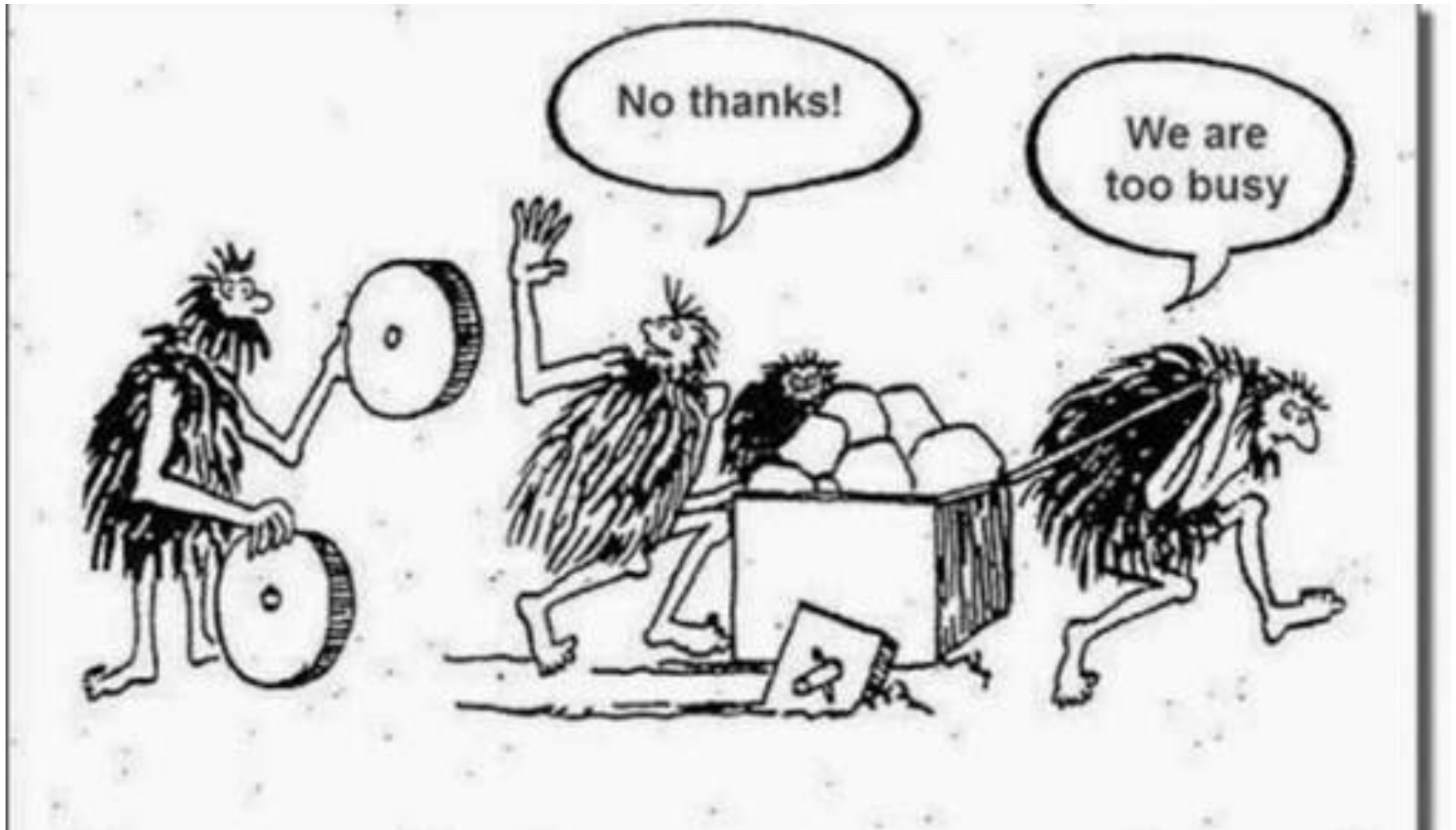- Experience with teaching these skills shows consistently that they are priceless.

What I Will Give You

- All that I know and that I believe to be worth passing to you (and anything else that you may be interested in).

- I have much more experience to share than fits the slides – ask good questions!

- I will be glad to meet with you outside of the class!

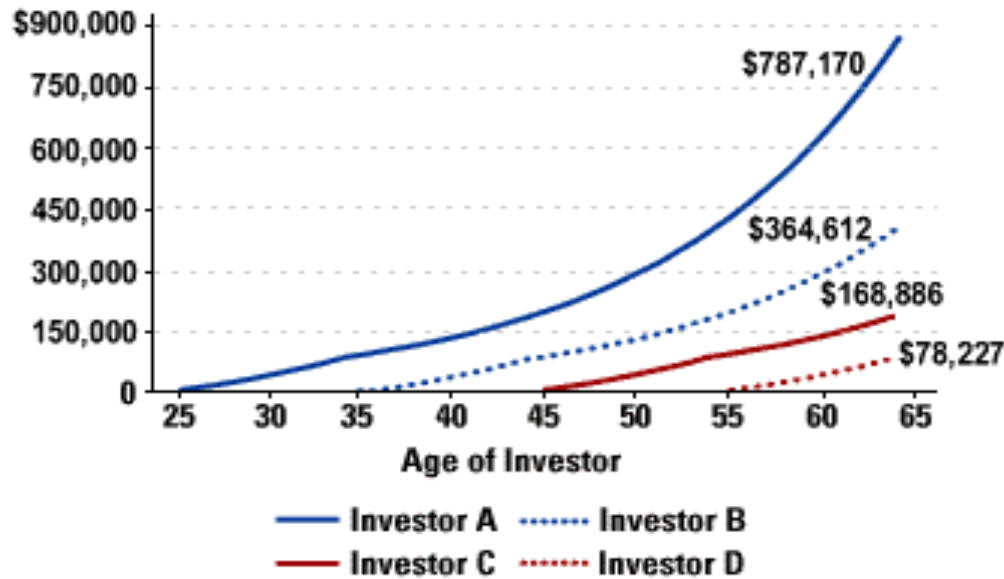# Giving and Taking...

What I expect from you

- Come to our meetings.

- Be active (ask, add, disagree).

- Help me to improve this course for the sake of your younger colleagues.

- Pass these skills to your younger colleagues.

- Relate the contents of this class to your professional career.

- Succeed and make our university famous!

Invest early!

"Give me back my youth!" -- Goethe

Assumes investment of $5,000 a year for ten years only.

$787,170

$364,612

$168,886

$78,227

Age of Investor

Investor A ······· Investor B
Investor C ······· Investor D

e Print: We made this pretty chart with the assumption that the investment earn
a year after taxes and that all dividends and distributions were reinvested. It's a
othetical illustration (as opposed to a completely freehand one) and is not
nded to represent the expected earnings of any investment. There. Now our
yer's happy.

- Invest into your skills as soon as you can (and not later than now ☺).

- You will reap the fruits for the rest of your career!

II. Structure of PhD program

- Coursework
- Preliminary examination
  - Course requirements
  - Examination
- Comprehensive examination
- Dissertation proposal
- Dissertation defense
- Timeline
- Expectations

Coursework for PhD in IS

- IS PhD course work – 48 credits (Pitt PhD work – 72 cr)
  - 12 more credits (60) if you do not have MS degree
  - You may also need to complete prerequisite coursework (not a part of 48 credits, but could be a part of 72)
- Required courses (30 credits)
  - Preparation for Preliminary Examination (27 credits)
  - One advanced statistics (3 credits)
- Dissertation work (18 credits)
  - A minimum of 18 credits of dissertation study
- But it is not what your PhD preparation is really about!

Prerequisite Courses

- Have to be completed before enrollment or within first 4 terms. Not considered for your 60 credits!

- Statistics or Discrete Math (e.g., IS 2060 Statistics or IS 2020 Mathematical Foundations)

- Cognitive Psychology (e.g., IS 2300 Human Info Processing or IS 2350 Human Factors)

- Systems Analysis and Design (e.g., IS 2510 Information Systems)

- Data Structures (e.g., IS 2500 Data Structures)

- Database Management (e.g., IS 2710 Database Management)

Preliminary Examination

- Preparation: Course requirements
  - Four core curses
    - http://www.ischool.pitt.edu/ist/degrees/phd-details.php
  - Two independent studies
  - Three doctoral seminars (3005 required)
- Examination

  - Prepare a research paper
  - Present and defend your work
- You don't need to have all the courses completed before the examination but you have to fulfill both in order to formally pass the preliminary examination

Preliminary Examination

- Prelim is focused on *research*
  - You already demonstrated that you can pass exams in your BS (and MS) coursework
  - Publishable quality work and research paper
- An important and quite likely the most stressful and relatively hardest hurdle in the program
- This is where you show that you can make it
- 3-4 semesters in preparation!
  - IS – Second January of your PhD studies
  - ISP – End of the second semester

How to prepare to the Prelim

- Learn what good research is
  - Working with literature
  - Doing research
  - Writing
  - Presenting
  - This course is a good start
- Start working on your research early
  - Identify faculty who are doing what you are interested in
  - Find interesting and promising topic
  - Work with advisor and other faculty (2 indep. studies)

Comprehensive Examination

- An evaluation of the breadth and depth of your knowledge in your area of focus
- Should be relevant to Information Science
- Three legs on which your knowledge of the field rests
- Lot of flexibility in what these three legs are
- Do it when you are ready
  - in terms of having selected your research area and dissertation topic

Comprehensive Exam Committee

- Your committee (examiners) is very important
- Three IS faculty represent three areas of expertise
- They will guide your reading to help you gaining critical expertise
- First step to dissertation work
  - Prelim work will be a ground of your thesis review part
  - Your examiners will likely be on your thesis committee

Dissertation Proposal

- Identify Dissertation Advisor

- Form your dissertation committee
  - Four committee members
  - Three program faculty, one external member

- Prepare and defend your proposal
  - A contract between you and your doctoral committee

- Once you defended the proposal, you will become a PhD *Candidate*
  - At that point you only need 42 credits (!)
  - Do it early rather than late

Dissertation Defense

- Your final examination in this program

- Complete the proposed study

- Write your thesis

  – Most important publication of your life
  – Accessible to all world online

- Defend your work

- After this examination, you will be a scientist with a license

Coursework Overview

- Required coursework (30 credits)

    – Four core courses (12 credits)

    – One introductory doctoral seminar (3 credits)

    – Two topical doctoral seminars (6 credits)

    – Two independent research studies (6 credits)

    – One advanced statistics (3 credits)

- Dissertation work (18 credits)

    – A minimum of 18 credits of dissertation study

The Timeline

First Year Fall		IS 3005	Core Course	Prerequisite	
First Year Spring		Independent Study	Doc Seminar	Core Course	
First Year Summer		Independent Study, Statistics, Last Prerequisite Courses, research and/or teaching			
Second Year Fall		Doc Seminar	Core Course	Research Study	
Second Year Spring	Preliminary Examination	Core Course	Core Course	Advanced Statistics	
Second Year Summer		Independent Study, research and/or teaching			
Third Year Fall		Electives	Electives	Electives	
Third Year Spring	Comprehensive Exam	Dissertation Work			
Fourth Year Fall	Dissertation Proposal Defense	Dissertation Work			
Fifth Year Spring	Dissertation Defense	Dissertation Work			

How Long does it Really Takes

- Yes, you can do it in 5 years – i.e., if you work hard and all goes well

- Things happen, however
  - Delayed on prelim
  - Change of topic and advisor
  - Not sure what you want
  - The idea does not work
  - Need to assemble a strong vita for the job market

- Expectation: no more than 6 years
  - Statute of Limitations

Are you on Track?
Annual Progress Review

- Students and their advisors independently fill out a progress report form, due 2nd Friday of January.

- Progress review meeting around two weeks later.

- Progress of every student is individually discussed by the faculty and every student receives a letter from the chair of the Ph.D. Committee.

- Why it is called Black Friday?

Informal Message from the Faculty

- Focus on your research and not on your courses.

- The course requirements are minimal.

- If you do so, all examinations, including the preliminary examination, are going to be easy for you.