INFSCI 3005
Introduction to Doctoral Studies

Syllabus

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and Intelligent Systems Program,
University of Pittsburgh**

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Fall 2014 (15–1)

OVERVIEW:

INFSCI 3005 is a course established by the School of Information Sciences faculty to introduce new doctoral students in the Information Science and Intelligent Systems Studies programs to the working of the scientific enterprise, scholarly research, ethics, and other useful skills required of a scientist. The participants of this course are first year doctoral students in the School of Information Sciences and College of Arts and Sciences Intelligent Systems Studies programs. Others can take the course or audit it by permission of the instructor.

As you might have already experienced as aspiring scientists, being a researcher requires intelligence, independent, creative thinking, and most of all commitment to hard working. This course reinforces this. There will a fairly high amount of readings. I have selected them in such a way that they are fun to read and I expect that you will do them all with pleasure. You will be expected to prepare a draft of a research problem, work it out over the course of the semester, and present it to the class at the conclusion of the course.

Another experience that this course will provide you is peer review, subjecting your work to anonymous judgment of your colleagues and judging the work of others. The workload in this class will be moderately heavy, but I believe that you will find it interesting and important. I require your commitment, doing the readings, coming to classes, and being their active participant. In return, I promise that you will have fun and you will learn many useful skills.

YOUR RESOURCES:

The course:

Name	:	INFSCI 3005: Introduction to Doctoral Program
CRN	:	25176
Credits	:	3.0

**The instructor:**

Marek J. Druzdzel

associate professor, School of Information Sciences and Intelligent Systems Program, University of Pittsburgh

Office	:	B-213 IS Building (Decision Systems Laboratory)
Email	:	*marek@sis.pitt.edu*
Phone	:	(412) 624-9432 (office, voice mail)
FAX	:	(412) 624-5231
WWW	:	http://www.pitt.edu/~druzdzel
FTP	:	ftp://ftp.pitt.edu/users/d/r/druzdzel
		(host *ftp.pitt.edu*, directory *./users/d/r/druzdzel*)

Meeting times and locations:
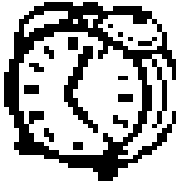
Classes (828 IS Building):
    Wednesdays, 12pm-2:50pm (break 1:20pm-1:35pm)
Office hours (B-212 IS Building):
    By appointment

Your colleagues:

Name: _____

Phone: _____

Email: _____

Name: _____

Phone: _____

Email: _____

Name: _____

Phone: _____

Email: _____

Name: _____

Phone: _____

Email: _____

Name: _____

Phone: _____

Email: _____

THE COURSE:

Objectives:

The primary objective of this course is to introduce you to the working of scientific enterprise and to the doctoral programs in Information Science and Intelligent Systems. This should contribute to your success in doctoral studies. Written assignments should increase your skills in scientific writing. Your oral in-class presentation will give you an opportunity to improve your presentation skills.

Prerequisites:
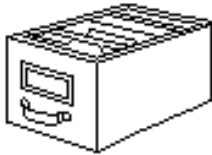
Participants in this course are first year doctoral students in the School of Information Sciences and in the Intelligent Systems Program. This requirement can be relaxed in individual cases – I had both undergraduate and M.Sc. students taking this class in the past but you should approach me for permission to take this class. The most important prerequisite for taking this course is your interest in scientific research, motivation, and commitment to learning.

WORK REQUIREMENTS:

Class presentations:

You will be expected to give a 15 minutes long presentation of your research paper towards the end of the course. You will be also expected to prepare your presentation in PowerPoint (we will have a computer with a projection panel in the classroom). The presentation and your abstract will be graded and you will also receive feedback on your presentation from the audience.

Peer review:

One of the basic mechanisms of the scientific enterprise is peer review: exposing your work to the judgment of other researchers possessing sufficient expertise to judge the merits of your work fairly. You will be expected to participate in this process as soon as you start your scientific career: your work will be reviewed and you will be asked to review the work of others. This class will provide you an opportunity to get acquainted with both sides of this mechanism by exposing your work to the judgment of your colleagues in the class and the instructor and by judging the work of others. The review process will be anonymous (except to the instructor). You can be harsh as long as your criticism is constructive. You will be judged on both your work and your reviews. Please, try to do a good job on the latter. If done well, a review is usually very useful for the author. When reviewing research papers, be very detailed and make also corrections pertaining to spelling and language use. As most of the papers from this class will end up being developed further, your comments will be very valuable for the author.

Computer use:
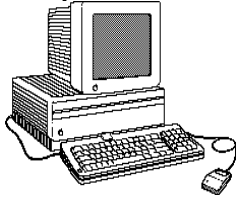
You will be required to use computers for typesetting your documents and for communicating with me and your classmates. You will share your documents with your reviewers electronically. They have to be produced in an easily readable/printable format, such as PDF (recommended), PostScript, or raw ASCII. The reviews should be submitted in raw ASCII. There will be no limitations on which system you use. The peer review process and our communication will be electronic. You will be expected to use electronic mail on a daily basis.

Time load:

To help you with planning your semester, I would like to give you an idea of the minimal workload in this course. Expect to spend around five hours quality time outside of class for every class meeting. I estimate that you will need about three hours to do the readings and two hours (on the average) to work on your research paper. It is explicitly allowed and encouraged to combine your work on the research paper with other coursework, a research seminar, or an independent study. The catch is that if you combine your project with another piece of work, I expect you to put an appropriately higher amount of effort in both (please do check with the other teacher if it is OK with him or her and do tell me that you are doing this!).

Grading:
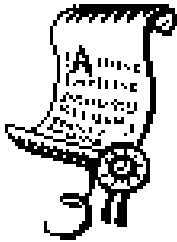
Your final grade for the course will be determined by: (1) your seminar attendance, (2) your use of local seminar resources and attendance in seminars, (3) three versions of your research paper, (4) your reviews of two research papers of your colleagues, and (5) your presentation, combined in the proportion 30%, 20%, 30%, 10%, and 10% respectively. You will also have to obtain University of Pittsburgh research certifications before you receive the grade. On the top of this all, you can obtain up to 10% extra for your in-class activity.

COURSE OUTLINE

August 27	*[Readings: Agre; Bundy et al. 1984; Bundy et al. 1985; desJardins; Zanna&Darley*] Introduction to the course Review of the doctoral program and planning your doctorate
September 3	*[Readings: Peter&Olson*] What is research? The working of scientific enterprise. Video: *Race to Catch a Buckyball*
September 10	*[Readings: Valdes-Perez*] How to identify a good research problem? Video: Herbert A. Simon *Creativity and Scientific Discovery*
September 17	No class (Marek's travel)
September 24	*[Readings: Hamming; Sutherland*] Career Planning Video: Steve Jobs' 2005 Stanford Commencement Address http://www.youtube.com/watch?v=Hd_ptbiPoXM Video: Kenneth Olden *Some Keys to a Successful Career*
October 1	Writing research articles
October 8	***** First version of the research paper due (one page long) ***** Presentation in front of an audience
October 15	*[Readings: Campanario; Shriver; Thomson; Psaraftis; Smith*] Peer Review Citation indices Reference and Search Tools (Google, Google Scholar, CiteSeer)
October 22	*[Readings: Bronner; McKeachie*] Teaching skills
October 29	Guiding students, running a lab, managing projects
November 5	***** Second version of the research paper due (three pages long) ***** Marketing your skills: Job hunt Video: Allen Newell *Desires and Diversions* http://wean1.ulib.org/cgi-bin/meta-vid.pl?target=Lectures/Distinguished%20Lectures/1991
November 12	*[Readings: Baron*] Obtaining funding: Writing Grant Proposals
November 19	What is really important? Time management, motivation, coping with stress, balancing work and personal life Video: Randy Pausch's "last lecture:" http://www.youtube.com/watch?v=ji5_MqicxSo.
November 26—30	*Thanksgiving recess*
December 3	Ethics in Science (conflict of interest, plagiarism, dealing with conflicts) Video: Herbert A. Simon *Ethics in Science*
December 4 (Thursday)	***** Final version of the research paper due (six pages long) *****
December 9 (Tuesday)	***** Reviews of research papers due *****
December 10	***** Presentation of your research papers ***** Oral presentations

Sources of readings:

[Agre] Phil Agre. *"Networking on the Network: A Guide to Professional Skills for Ph.D. Students."* Unpublished paper, available electronically through WWW at http://dlis.gseis.ucla.edu/people/pagre/network.html

[Baron] Robert A. Baron. *"Research Grants: A Practical Guide."* In: Mark P. Zanna & John M. Darley (editors), *"The Compleat Academic: A Practical Guide for the Beginning Social Scientist,"* Chapter 7, pages 151-169, New York: Random House, 1987

[Bronner] Simon J. Bronner. *"Piled Higher and Deeper: The Folklore of Student Life."* Little Rock: August House Publishers, Inc., 1995

[Bundy et al. 1984] Alan Bundy, Ben du Boulay, Jim Howe & Gordon Plotkin. *"How to Get a Ph.D. in AI."* In Tim O'Shea & Marc Eisenstadt (editors) *"Artificial Intelligence: Tools, Techniques, and Applications,"* Chapter 5, pages 139-154, Cambridge: Harper & Row Publishers, 1984

[Bundy et al. 1985] Alan Bundy, Ben du Boulay, Jim Howe & Gordon Plotkin. *"The Researcher's Bible."* Available electronically through WWW at http://homepages.inf.ed.ac.uk/bundy/how-tos/resbible.html, 1985

[Campanario] Juan Miguel Campanario. *"Have Referees Rejected Some of the Most-Cited Articles of All Times?"* Journal of the American Society for Information Science, 47(4):302-310, 1996

[desJardins] Marie desJardins. *"How to Be a Good Graduate Student/Advisor."* Unpublished paper, available electronically through WWW at http://www.ai.sri.com/~marie/papers/advice-summary

[Hamming] Richard Hamming. *"You And Your Research."* Transcription of the Bell Communications Research Colloquium Seminar, 7 March 1986, available electronically through WWW at http://www.cs.virginia.edu/~robins/YouAndYourResearch.pdf

[McKeachie] Wilbert J. McKeachie. *"Teaching Tips: A Guidebook for the Beginning College Teacher."* Lexington, MA: D.C. Heath & Co.,17th edition, 1978

[Peter&Olson] J. Paul Peter & Jerry C. Olson. *"Is Science Marketing?"* Journal of Marketing, 47, 111-125, 1983

[Psaraftis] Harilaos N. Psaraftis. *"Review Standards for OR/MS Papers: How To Make an Imperfect Process Less Imperfect."* OR/MS Today, pages 54-57, June 1994

[Shriver] Bruce D. Shriver. *"The Benefits of Quality Refereeing."* IEEE Computer, pages 10-16, April 1990

[Smith] Alan Jay Smith. *"The Task of the Referee."* IEEE Computer, pages 65-71, April 1990

[Sutherland] Ivan Sutherland, *"Technology and Courage."* Available electronically through WWW http://cseweb.ucsd.edu/~wgg/smli_ps-1.pdf

[Thomson] Keith Steward Thomson. *"Scientific Publishing: An Embarrassment of Riches."* American Scientist, 82, 508-511, 1994

[Valdes-Perez] Raul E. Valdes-Perez, *"Personal Recollections from 15 years of Monthly Meetings."* In Essays in Honor of Herbert Simon, Elisabeth Augier and James G. March (eds.), MIT Press, 2002, Available electronically through WWW http://web.cs.dal.ca/~eem/gradResources/HerbertSimon.pdf

[Zanna&Darley] Mark P. Zanna & John M. Darley. *"Everything You Always Wanted to Know About Research but Were Afraid to Ask (Your Advisor)."* In: Mark P. Zanna & John M. Darley (editors), *"The Compleat Academic: A Practical Guide for the Beginning Social Scientist,"* Chapter 5, pages 115-137, New York: Random House, 1987

General references:

[Davidson&Ambrose] Cliff I. Davidson & Susan A. Ambrose. *"The New Professor's Handbook: A Guide to Teaching and Research in Engineering and Sciences."* Boston: Anker Publishing Company, Inc., 1994

[Deneef&Goodwin] A. Leigh Deneef & Craufurd D. Goodwin (eds.). *"The Academic's Handbook."* Durham: Duke University Press, 2nd edition, 1995

[Strunk&White] William Strunk, Jr. & E.B. White. *"The Elements of Style."* New York: MacMillan Publishing Co., Inc., 1979

[Patterson] Non-Technical Talks by David Patterson, U.C. Berkeley, available at http://www.cs.berkeley.edu/~pattrsn/talks/nontech.html

TERM PROJECT (RESEARCH PAPER/PROJECT PROPOSAL)

As the term project you will be expected to write a white paper outlining a research idea. This means a short report describing in some detail a research problem, with all the necessary supporting materials and argumentation. This includes the objective of your research (i.e., what problem you are planning to solve), its importance (i.e., why it is useful), prior work (i.e., how your problem fits into the existing body of knowledge), research strategy (i.e., how you plan to address the problem), expected results and time frame.

Choice of the problem:

The research idea that you will describe should be real, ideally something that could over the course of a semester become the introduction to your preliminary examination paper.

You will be responsible for choosing a research problem yourself. There are no rules that would help you in choosing a research topic, but there are some heuristics that we will talk about during the class meetings. Also, unless you are well on the way in your research, the first few weeks of the semester might be the best time to meet with your advisor and ask his or her advice about the possible directions that your research work should go. Ask your advisor for suggestions as to which way your research should develop. If you do not have an advisor with whom you work or are otherwise undecided, talk to me and I will be glad to help you in choosing a research topic, suggesting an advisor, or advising you. I have always a few interesting problems to work on myself and I will be glad to suggest a problem, give you initial pointers, and work it out into a proposal with you over the course of the semester. Feel free to get in touch with me if you are interested, but please do it early.

Length of the paper:

There are three versions of your paper: initial, advanced, and complete, of 1, 3, and 6 pages respectively.

ISP 2020 (*Topics in Intelligent Systems*) course requirement:

ISP students participating in this class will fulfill the requirements stated at the following page:

  http://www.isp.pitt.edu/degrees/courses/ISSP2020

In particular, the research paper described on this page fulfills the requirement of a research proposal. Please do make sure that you develop this proposal in collaboration with your ISP faculty advisor. Please do keep in mind that you will be executing this proposal under the supervision of your ISP faculty advisor in the subsequent semester as part of the requirement for the following ISP course:

  http://www.isp.pitt.edu/degrees/courses/ISSP2030

To make sure that your work and your fulfilling of the ISP requirement does not fall between the cracks, I will be sharing your final version of the paper with the ISP director.

Submission requirements, review, and evaluation criteria:

Submit each of the three versions of your paper by the deadlines listed in the syllabus. You are expected to submit one hard copy version for me and also, in case of the final version of your paper, a PDF file through the CourseWeb. The criteria for grading your papers are soundness, clarity of your writing and expressing your ideas, creativity, doability (the proposed work within the proposed amount of time). Also, you should submit your final version and your mid-term version with my comments along with the final version of your paper. Make sure that you save these.

I also require that you do the typesetting of your paper in LaTeX. In case you have never used LaTeX, this is the time to learn the basics. It is free and widely available for most computing platforms. Majority of scientists in our discipline use LaTeX because of its versatility, power, convenience, and popularity. Most conferences and journals supply LaTeX macros describing the submission format.

USE OF LOCAL RESEARCH COLLOQUIA RESOURCES

Searching for and posting information about colloquia:

Every week, you will be expected to search for academic research colloquia of relevance to the Information Science and Intelligent Systems Program community available around Oakland (typically, although not necessarily limited to University of Pittsburgh or Carnegie Mellon University campuses) and post information about at least one new colloquium on the CoMeT system (http://halley.exp.sis.pitt.edu/comet/). Each week you will get one point or a zero (if you posted nothing that week). I will allow one week without posting, so the total number of points that you can gain for this is 15. Posting a duplicate talk (see below) will yield a -1.

The colloquia that you will post should be academic talks that PhD students like you may be interested in attending to broaden their horizons and to learn about relevant research frontiers. There are many events happening on campus and outside, which do not fall into this category and should not be posted – they do not do much good except for adding noise. Please, do not post entire conferences, as these have many talks and require registration. Do not post educational workshops, which are typically organized by business schools, like Networking Workshop or Interview Skills Workshop. The only exception here is workshops focused on Ph.D. students and research. Please do not post paid or restricted events (e.g., Katz School of Business students only) they are not open for the target audience of the CoMeT system. A posted event may require registration and be limited by space, but it still should be open and free. Please do not post colloquia/talks that happen outside of Pittsburgh and are just broadcasted. Please avoid any activities that do not look like research talks.

Note that CoMeT is not limited to academic research events and occasionally other events are posted by organizers or other stakeholders. But your task in this class is to post academic talks and recognizing these is a skill that you will need to practice! A relevant talk to post should be clearly looking as an academic research presentation, with speaker, abstract, bio, campus location, time, sponsoring department, etc. If some of this information is missing, think twice whether it is really an academic talk.

Avoid posting duplicates. They result in negative score! Check the corresponding day in the Calendar before posting – it is easy. If you make a mistake and realize later that you have posted a duplicate (you can see that you are not the first one posting the talk), the easiest way out is to edit it into some other event.

Try to be careful posting talk details. Do not forget things like URL, location, speaker, affiliation, abstract (and possibly BIO). If the talk misses some of this information, consider posting some other talk instead, with complete info. Relevant, but incomplete posts will be credited partially.

If the talk is a part of a series, do not forget to check the correct series when posting. If the series that this talk belongs to does not exist yet, create a new series. Each series has its permanent sponsors, so adding sponsors to an individual talk of a series is not needed. If it is not a part of a series, make sure that the organizer (sponsor) is added correctly. You only need to add the most specific sponsor. For example, if a talk is sponsored by Robotics Institute of Carnegie Mellon University's School of Computer Science, you do not need to add Carnegie Mellon University and Carnegie Mellon University's School of Computer Science as sponsors. Note that talks might have several sponsors – add each on the most precise level.

You can see the impact of your past postings in CoMeT. Just click on your name (or the name of any person who submitted any talk) and then click "Impact Summary." It will give impact for the current week. You can use forward and back arrows to navigate timeline by weeks or months. The three students who have made the biggest impact will receive 5, 3, and 1 extra points respectively.

Attending colloquia:

You will also be expected to attend one colloquium of your choice per week from among those that have been posted on the CoMeT system. It does not need to be the one that you posted – choose one that interests you most. If the colloquium that you plan to attend has not been posted, you can post it prior to attending it ☺. ISP students have to attend the bi-weekly ISP research forums. After the colloquium, you will need to create a one-page blog about each talk attended, stating what you found to be most interesting about the talk and why. You need to create a research blog for this purpose and make your blog accessible to me (I will assign you one point for each qualifying talk that you attended with a maximum of 15 over the course of the semester).

OBTAINING RESEARCH CERTIFICATIONS

One of your tasks for the semester will be to obtain three research certifications that are required of doctoral students participating in research projects. Your advisor will appreciate greatly the fact that you have obtained these when employing you as a research assistant in a research project.

Here are certifications and the links to on-line courses that you need to follow to obtain them.

Research Integrity:

https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=loadmodule&moduleid=4981

Responsible Conduct Of Research – For NSF Trainees:

https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=loadmodule&moduleid=6581

Human Subjects Research in Social and Behavioral Sciences:

https://cme.hs.pitt.edu/servlet/IteachControllerServlet?actiontotake=loadmodule&moduleid=1521