Faculty of Information, University of Toronto

INF1003F: Information Systems, Services and Design

Winter 2017   **L0101:** Tuesdays, 6:30pm – 9:00pm in BL325

Instructor   Colin Furness MISt PhD MPH (Room BL #631)
                      Email: colin.furness@utoronto.ca
                      Office hours: Tuesdays 1-3pm or by appointment

Course description

Information systems permeate seemingly all aspects of both work and play. One of the greatest drawbacks in the use of such technologies, however, is poor technological literacy among system owners and users alike: a tendency to unbridled enthusiasm for what information systems can do, but without concomitant reflection on their limitations, and critical implications of how and why they are used.

This course will orient students to fundamental perspectives necessary for sound technical judgment about the place of information and communication technologies in contemporary society. A balance of theory and practical perspectives is sought. On the theoretical side, three interrelated themes are developed: the structure of information systems, the design of information systems, and the social implications of information systems. The practical side is developed through assignments (modeling, assessment, and development planning), and through the perspectives of a variety of guest speakers from industry.

Prerequisites:

This is an introductory course with no prerequisites or co-requisites.

Course Objectives & Learning Outcomes

Students will develop an understanding of how information systems work, to be able to appreciate their capabilities and limitations. At the end of the course, students will be able to: (see over)

Theoretical Objectives	Practical Objectives
- Know the origins and evolution of IS - Understand the function and structure of networks and databases - Describe systems development methods - Discuss how to measure IS quality - Appreciate multiple ethical issues in the deployment of IS, both in and out of workplaces - Articulate the challenges and limitations of electronic support of group activities	- Demonstrate data modeling skills in constructing entity-relationship diagrams and data flow diagrams - Describe how to systematically evaluate an existing information system - Demonstrate an ability to author a Request for Proposals document - Participate meaningfully in the planning process for an IS design and implementation

Relationship to MI Program-Level Student Learning Outcomes
(http://current.ischool.utoronto.ca/studies/learning-outcomes)

This course will help students to become conversant with information systems fundamentals, theories and practices (Outcome 1). Inclusion of a sociotechnical systems framework and ethics of information systems will instill students with values of social responsibility appropriate for information professionals (Outcome 2). The theoretical component of this course will help students appreciate where information is found and how it is used (Outcome 4). The inclusion and discussion of industry innovation guest speakers will expose students to new technological developments and their impact on society (Outcome 5). Finally, a balance of theoretical and practical material will equip students to continue to make sense of evolving information systems through their careers (Outcome 6).

Required Readings

Textbooks on this topic tend to be very expensive, easily outdated, and either too focused on business aspects or too focused on technical aspects of the subject matter. Accordingly, there is no required text for the course. However, there are readings every week, cobbled together from publicly available and scholarly sources. These are listed in the weekly schedule. Some are links from this document, and some are documents that can be found in the "Readings" folder on Blackboard (see next section).

Blackboard

Blackboard will be used in this course for the purposes of posting readings, posting lecture slides, conveying announcements for the Week, and for groups to collaborate and post their work. It is imperative that you have a "utoronto.ca" email address associated with your ROSI account in order to receive Blackboard announcements. Forwarding "utoronto.ca" email to Gmail is *not* recommended.

Students with a disability or special needs

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability or health consideration that may require accommodations, please feel free to approach the instructor and/or the Accessibility Services Office as soon as possible. The Accessibility Services staff is available by appointment to assess specific needs, provide referrals, and arrange appropriate accommodations. The sooner you let them, and the instructor, know your needs, the sooner we can assist you in achieving your learning goals in this course.

Writing support

The [SGS Office of English Language and Writing Support](#) provides writing support for graduate students. The services are designed target the needs of both native and non-native speakers of English and include non-credit courses, single-session workshops, individual writing consultations, and website resources. These programs are free. Please avail yourself of these services, if necessary.

Evaluation milestones

This course includes three assignments, and weekly ungraded quizzes that help you self-assess how well you are assimilating key concepts presented in class and in your readings. The due date and weight for each assignments is shown below. Assignments are described in more detail beginning on page **6** of this syllabus.

Item	Due	Weight
Weekly ungraded quizzes*	n/a	10%
Data model assignment	February 14 (week 6)	25%
IS assessment plan	March 14 (week 9)	30%
Request for Proposal (RFP)	April 10 (week 13)	35%

*A 5-minute quiz each week on the prior week's material. Quiz scores themselves are **not** counted; being present to complete them is sufficient to earn full marks.

Academic integrity

Please consult the University's site on [Academic Integrity](#). The iSchool has a zero-tolerance policy on plagiarism as defined in section B.I. 1. (d) of the University's [Code of Behaviour on Academic Matters](#). You should acquaint yourself with the *Code* and Appendix "A" Section 2.   Please review the material you covered in [Cite it Right](#) and, if necessary, consult the site [How Not to Plagiarize](#).

Extensions

Requests for extensions should be submitted to the instructor by email before the due date. A request will normally be granted when done well in advance, but appropriate supporting documentation may be requested in some cases.

Late submission of assignments

Late submission of an assignment carries a penalty of one grade point (e.g., from B+ to B) for each week to a maximum of two weeks; thereafter any passing assignment receives a B-minus grade.

Extensions beyond the end of term

Extensions beyond the term in which the course is taken are subject to guidelines established by the School of Graduate Studies (SGS). Please see: http://www.sgs.utoronto.ca/facultyandstaff/Pages/Coursework-Extensions.aspx   "The authority to grant an extension for the completion of work in a course beyond the original SGS deadline for that course rests with the graduate unit in which the course was offered, not the instructor of the course." Students must petition the graduate unit for extensions, using the [SGS Extension to Complete Coursework form](#).

Weekly Schedule

Date	Lecture Schedule	Key Dates and Guest Speakers
Week 1: **January 10**	**Course introduction & history of information systems** Readings: Campbell-Kelly & Aspray (1996) – Blackboard	
Week 2: **January 17**	**Hardware: nuts & bolts of computers & networks** Video: How to build a computer: https://www.youtube.com/watch?v=lPIXAtNGGCw	
Week 3: **January 24**	**The nature of software** Readings: Cantwell Smith (1985) - Blackboard	**Last day to add course: Jan 23**
Week 4: **January 31**	**Databases I: introduction to data modeling** Readings: http://www-03.ibm.com/ibm/history/ibm100/us/en/icons/reldb/ Hoberman S. *Data Modeling Made Simple: A Practical Guide for Business and IT Professionals.* Chapters 1,2,4 (pages 13-25 and 35-38. Available here via Google (page controls are in the lower right corner)	**Assignment #1 introduced**
Week 5: **February 7**	**Databases II: databases and their applications** Readings: http://www.newyorker.com/tech/elements/steamrolled-by-big-data	
Week 6: **February 14** ❤	**Sociotechnical systems and ethics** Readings: http://www.newyorker.com/magazine/2014/06/23/the-disruption-machine	**Assignment #1 due** **Guest speaker:** **Glen Farrelly, Accessibility expert**
Feb 20-24	**FALL READING WEEK – no class**	
Week 7: **February 28**	**Systems Design I: Evaluating information systems** Readings: De Villiers (2005) – Blackboard	**Assignment #2 introduced** **Last date to drop course: Feb 27**
Week 8: **March 7**	**Systems Design II: Requirements gathering, development methods, and innovation** Readings: Sasankar & Chavan (2011) – Blackboard	
Week 9: **March 14**	**Systems Design III: Planning a system implementation** Readings: Nah et al (2001) – Blackboard	**Assignment #2 due** **Assignment #3 introduced** **Guest speaker:** **Patrick Parato, RFP expert**

Week 10: March 21	**Information Systems Security** Readings: http://www.newyorker.com/tech/elements/hacking-cryptography-and-the-countdown-to-quantum-computing http://www.economist.com/news/special-report/21606416-companies-markets-and-countries-are-increasingly-under-attack-cyber-criminals http://www.economist.com/news/science-and-technology/21708220-electronic-tsunami-crashes-down-solitary-journalist-internet	**Guest speaker:** **Martin Loeffler, security expert**

Week 11:
 	
March 28
	Information Systems and Privacy
	Readings:
	        Kling (1996) p727-743 – Blackboard
		Guest speaker:
		   Rafael Eskenazi, privacy expert

Week 12 April 4	**Obsolescence and digital preservation** (no readings)	**Assignment #3 due April 10**

Assignment #1: Data Modeling (25% of your final grade)

In this assignment, you will choose one of the scenarios listed below and will then perform preliminary design work by creating an entity-relationship diagram.

The scenarios to choose from are listed below, and are described in detail on Blackboard.

> **Case A:** Happy Endings Nursing Home Patient Records
> **Case B:** Hogwarts School Asset Management System

You should hand in your ERD drawing, together with a write-up of **no more than 750 words** with the following two headings. Your diagram will be compared with what you describe in your report.

a. Model Description
   Describe your entity-relationship diagram completely, and in plain English: what are all the relationships among the data being managed?

b. Reasoning/Assumptions
   In creating your model, what reasoning or assumptions about the case did you need to make (e.g., inventing business rules) about the nature of the data, or how they are being used?

You may use whatever drawing program you wish to create your diagram. Microsoft Word has diagramming capability. Powerpoint is a popular choice because it is easy to use and very interoperable with Microsoft (to insert scalable/resizable diagram objects in a Word document, copy them from Powerpoint, and then choose "paste-as-picture" in Word.) However, you may also be interested in experimenting with free online software (software as a service!), such as Gliffy (http://www.gliffy.com/).

Please include a cover page with your name, date submitted, and word count. The assignment is due in hard copy at the beginning of class on Week 6 (February 14).

Assignment #2: Information Systems Evaluation Proposal (30% of your final grade)

In this assignment, you are writing a proposal to evaluate an information system of your choice, ideally one where you have direct knowledge or informal relationships with those who do, who can act as informants for you. The imaginary audience for your proposal could be your supervisor at work, or a prospective client, perhaps – either way, you are proposing it in a way that **you** would be able to take responsibility for carrying it out. Your proposal should include the three sections below, and should address all questions posed, in **no more than 2,000 words** (excluding any references or appendices). This assessment framework needs to be coupled with the lecture on evaluation of information systems.

Part 1: Context
1. Briefly describe the organization, and the information system to be studied. Be sure to include any paper-based parts of the system and system boundaries. What is the role of the system in the organization?
2. What is the technical environment of the system – what hardware and operating systems are involved?
3. Was the system purchased or developed in-house? When? Is any information available on the development process and design decisions made?
4. Are there any external agencies, entities or data sources that the system interacts with? This information will help you define the boundaries of the system.
5. Describe all user groups for the system, and identify any major non-user stakeholders.
6. What comparable or competitive information systems are available for comparison?
7. Are there industry averages or other standards against which the system can be compared?

Part 2: Question for Research
1. What is the motivation, or reason for doing the evaluation research?
2. State your research question(s) for this evaluation (e.g., "Is it meeting the organization's needs?")
3. What are the possible outcomes of this assessment? (e.g., no action, replacement, modification …)
4. In what ways should the system owner be cautious about how much the assessment can achieve? That is, what are the limits to what you believe can be concluded about the system?

Part 3: Method
1. Will your approach be interpretive, analytical, or both? Provide a rationale for your choice.
2. What is the evaluator relationship (independent vs participatory vs empowerment), and why?
3. What will you be measuring, exactly? What are your data sources, and how will data be collected from each source?
4. How will the data be analyzed? Against what will you compare your measurements?
5. Are you including consideration of cost effectiveness or ROI? If so, what costs need to be determined?
6. What threats to validity of your evaluation can you identify?

Please include a cover page with your name, date submitted, and word count. The assignment is due in hard copy at the beginning of class on Week 9 (March 14).

Avoiding Plagiarism
Unlike a typical academic essay, a business document like this proposal will **not** typically have inline citations for secondary sources that you may use (such as a company's description on its website).   If you do use secondary sources, provide an Appendix to your report listing these sources, and which page(s) in your report reference each source. If you are quoting directly (i.e., copying) from a source, you must put that text in quotation marks, and provide a footnote on that page with a precise citation (any citation style, just be consistent). It is rarely appropriate to quote directly (but with some exceptions, such as quoting the mission statement of an organization, or quoting a regulation, where the actual wording provided is important).

Assignment #3: Request for Proposal (RFP) (35% of your final grade)

In this assignment, you will build on the knowledge of the system you acquired in assignment 2, by creating an RFP for a system to replace it. Note that the system you studied in assignment 2 may not actually need replacing, but for the purposes of this assignment, we will pretend that it does. (It may be appropriate, in some circumstances, to choose a different system than the one you used in assignment #2, with permission of the instructor, but this is not recommended.)

There will be a guest speaker in class (Patrick Parato) who will discuss RFPs. Attending this talk will be essential to preparing a high-quality assignment. You will be provided with an RFP template as a basis for your assignment. Some of the headings in the template are very precise, but some will require you to think through what content and level of detail to include. Not all headings will be relevant for all projects, and you might even come up with important things to include that are not in the template. In other words, the template is a very useful guide – but not a crutch – for doing this assignment. You will find many concepts discussed in the course will be relevant for your assignment, even if they are not explicitly included in the template.

You will also need to do some research on your own, in order to:

(a)   Learn about other similar systems that are available, or in use. Things you might want to find out (where possible) include: whether any COTS (common off-the-shelf software) choices might exist, what other similar custom-built systems might exist, and the functionalities, technical requirements and cost of such systems.

(b)   Learn about what vendors or consultancies you may wish to invite to submit the bid.

There is no maximum word count for this assignment; students are encouraged to be concise but exhaustive.

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About the Instructor

Colin D. Furness holds MISt and PhD degrees from the Faculty of Information at the University of Toronto, in information systems design and information & knowledge management, respectively. He also holds a BSc in psychology from U of T, and an MPH in epidemiology at the Dalla Lana School of Public Health.

Prior to joining the iSchool full-time this year as an assistant professor, he was chief scientist at Infonaut Inc, working to use information systems to improve patient safety, including the use of real-time locating systems for tracking the movement of equipment and people.

Prior to his doctoral studies, Colin was one of the early information architects in the late 1990s in New York's Silicon Alley, and has practiced this craft in industry for nearly twenty years together with information systems evaluation and design work. Colin developed and launched Canada's first graduate course in information architecture at the iSchool in 2011, a course he taught until 2016.

Colin is also a cross-appointed assistant professor at U of T's Institute for Health Policy Management and Evaluation, in the Dalla Lana School of Public Health, in the Health Informatics program.