

Information Systems, Services and Design

(Text in red may/will change)

Tuesday: 1:00 pm - 4:00 pm, Room BL205

Lead Instructor: Periklis Andritsos
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Office Hours: Tuesday 12:00 pm - 1:00 pm
(also by appointment)
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Course Web Page: [Sign-in to Blackboard](#)
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NOTE: Text items in blue are clickable hyperlinks.

Course Description

Fundamental perspectives and skills necessary for sound technical judgment about the place of information and communication technologies in contemporary society. Critical analysis of the design fabrication, deployment, use, and maintenance of information systems and services. Analysis of modeling, architecture, implementation, inclusive access, modularity, life-cycle, and interoperability. Use of and familiarity with programming languages, databases, interfaces, interactive technologies. Critical methods and analytic techniques from Science and Technology Studies and related disciplines.

Prerequisites

INF1003H has no prerequisites. Some familiarity with IT, such hardware and software is expected.

Course Structure

Three (3) in-class hours per week will be divided into lectures and tutorials, in which we discuss and further probe topics covered in the lectures and readings. Note that for every one (1) hour of class time, students can expect to do 2.5 hours of reading and preparation work on their own, outside class.

During the class hours, students will be assigned to groups and work together on various activities that will assist in completing course work. The first assignment and midterm will be done individually. Students are expected to attend and participate in class.

Deliverables and Evaluation

Course evaluation	Due Date	Worth
Midterm test: This is an in-class individual test covering material from the first five weeks of the course. The time allowed is 3 hours and it will be an closed book exam.	Oct. 15 (week 6)	25%
Assignment 1: In this assignment, students will develop a proposal that makes a recommendation for a Smart Transportation System. As part of this proposal students will include a model of the proposed system. This assignment will be submitted as a paper (see below for more information).	Nov. 19 (week 10)	45%
Assignment 2: Designing and implementing a web-based (mashup) application. Group project design and implementation. More details will be given during the semester.	Dec. 3 (week 12)	30%

Groups: Students will be assigned to groups of 3-4 in the first couple of weeks of the course. These groups will work on activities during the classes, all term, to complete Assignment 2 together.

Self and peer assessment: Assignment submission will include self and peer assessment forms that must be completed by each group member separately (not included in the page count). These forms are strictly confidential and will be provided during the course. They will be further discussed in class.

Papers: Paper submissions should use the template and format posted on the Blackboard.

Presentations: Please note that the iSchool Fall 2013 instructional series (iSkills 2013) will be offering workshops on creating and presenting with Prezi (September 19, 2013, September 21 2013 and September 30 2013). These workshops will be held outside of class time. Students may find these sessions useful for Assignments 2 and 3.

Readings

Most weeks, the readings will be from articles in journals and conference proceedings or from book chapters. For the first five weeks, during which we cover foundational concepts of information systems, services, and design, we will also draw on material from textbooks. There are no required textbooks to buy, as the required readings (including textbook sections) will be scanned and uploaded to Blackboard, prior to each class.

NOTE: The following schedule and reading material is tentative and may change during the semester. Readings may be removed or merged and new ones may be added. In all cases, the readings will be assigned and posted prior to each class.

Textbooks:

- [SR] Stairs, R., & Reynolds, G. (2009). Principles of Information Systems (9th Ed.). Course Technology Press, Cengage Learning, United States. (few copies are available at the Inforum,

on reserve)

- [NHPM] Norrie, J., Huber, M., Piercy, C., & McKeown, P. (2010). Introduction to Business Information Systems (2nd Canadian Ed.). John Wiley & Sons Canada, Ltd. (few copies are available at the Inforum, on reserve)
- [BDHMP] Brown, C. V., Dehayes, D. W., Hoffer, J. A., Martin, E. W., & Perkins, W. C. (2012). Managing Information Technology (7th Ed.). New York: Prentice Hall. (a copy is available at the Inforum, on reserve)
- [W] Walsham, G. (2009). Interpreting Information Systems in Organizations. A [Global Text](#), available online through a Creative Commons license.

Weekly Schedule

The course material is broken down per week.

1. **Introduction:** Introduction to the course. What is an information system? How does INF1003 relate to other programs of study?

Required Readings:

- (a) [SR]: pages 10-15.
- (b) [BDHMP]: pages 329 to 335; stop before "System Analysis and Design".

Weeks 2-5 Foundations: In this section of the course we cover fundamental aspects of information systems, services, and design. Students will participate in group activities to further explore concepts that were introduced in the lectures.

2. **Architecture:** The principles, organizational structures, communication protocols, and interchange & interoperability standards of contemporary information systems.

Required Readings:

- (a) [NHPM]: pages 36-58.
- (b) Zachman, J. A. (1999). A framework for information systems architecture. IBM Systems Journal, Vol. 38, Nos. 2&3, 454-470 (reprint from Vol. 26, No. 3, 1987)

3. **Information:** The nature, organization, analysis, storage, and use of information in the context of information systems and services.

Required Readings:

- (a) [SR]: pages 182-213.
- (b) [NHPM]: pages 204-213.

4. **Design:** The role of abstraction, formalization, modeling, standards, protocols, and tools in the complex process of contemporary information system design.

Required Readings:

- (a) [NHPM]: pages 247-255.
- (b) Cantwell Smith, B. (1996). Limits of correctness in computers, ed. R. Kling Computerization and controversy, 2nd Ed., Academic Press, 810-825.

5. **Use:** The definition, design, development, evaluation, adaptability, evolution, and sustainability of information systems, including the role of users, the relation to management and organization and aspects of work flow.

Required Readings:

- (a) [SR]: pages 44 to 54.
- (b) [BDHMP]: pages 575-591.
- (c) Zimmerman, J. (2011). Killing off user-centered design, ACM Interactions, May-June, 2011, 10-11, doi:10.1145/1962438.1962442

Weeks 6-9 Scenario Analysis: In this section of the course, we apply the foundations learned in the previous section to an information scenario , the *Smart Transportation Systems case study*.

6. Exploring the definition, design, development, evolution, and sustainability of information systems, including the role of users, relation to levels of organization and politics, within the Smart Transportation Systems case.

Required Readings:

- (a) S. Chuang, K. Lyons and R. McEwen (2011). Smart Transportation Systems Case Study: Transportation and Information.
- (b) [W]: Chapters 1-3, pages 8-46

*** In-class midterm*

7. Applying an understanding of the nature, organization, analysis, storage, and use of information systems and services to the Smart Transportation Systems case.

Required Readings:

- (a) Giannopoulos, G.A. (2004). The application of information and communication technologies in transport, European Journal of Operational Research 152, 302-320.
- (b) Winner, L. (1986). Do artifacts have politics? in The Whale and the Reactor: A Search for Limits in an Age of High Technology, The University of Chicago Press, Chicago, 19-39.

8. Marshalling ideas about the role of abstraction, formalization, modeling, standards, protocols, and tools in the complex process of the Smart Transportation Systems case.

Required Readings:

- (a) Hirschheim, R. & Klein, H. (1989). Four paradigms of information systems development, *Communications of the ACM*, 32(10), 1199-1216.
- (b) Flanagan, M, Howe, D, & Nissenbaum, H. (2005). Values at play: Design tradeoffs in socially-oriented game design, in CHI 05 Proceedings of the SIGCHI conference on Human factors in computing systems, ACM, 751-760

9. Contemplating the principles, organizational structures, communication protocols and inter-change & interoperability standards in the Smart Transportation Systems case.

Required Readings:

- (a) Gavrilis D., Tsakonas G., & Papatheodorou C. (2008). Designing interoperable museum information systems. In Proceedings of the 14th International Conference on Virtual Systems and Multimedia.
- (b) Benbya, H., & McKelvey, B. (2006). Using coevolutionary and complexity theories to improve IS alignment: A multi-level approach, *Journal of Information Technology*, 21(4), 284-284-298. doi:10.1057/palgrave.jit.2000080

Weeks 10-13: Synthesis. In this section of the course, we address cross-cutting themes and topics, pulling together concepts from the previous course sections.

10. **Information Networks:** : The rise of information and communication technologies in contemporary societies has highlighted the interdependent nature of relationships: person-person, person-machine, machine-person, and machine-machine. Increasingly, information-rich environments such as workplaces, libraries, museums, and schools may be viewed as complex networks where relationships and interdependencies play a major part in how we experience these environments.

Required Readings:

- (a) Castells, M. (2005). The network society: From knowledge to policu, eds. Castells, Manuel and Cardoso, Gustavo, *The Network Society: From Knowledge to Policy*, Washington, DC: John Hopkins Center for Transtatlantic, Transatlantic Relations, pp 3-21. [link](#).
- (b) Gillespie, T. (2006). Engineering a principle: *End-to-end* in the design of the Internet, *Social Studies of Science*, 36(3): 427-457.

11. **Big Data:** A General Introduction (first hours of the class)

Required Readings:

- (a) [McKinsey&Company Report, June 2011](#)
- (b) [Challenges and Opportunities with Big Data](#). Computing Research Association (CRA), White Paper, February 2012.

Service Science: The relationship of service systems to information systems architecture, information, design, and use.

GUEST LECTURE BY Prof. KELLY LYONS

Readings:

- (a) Lyons, K. (2010). Service science in iSchools. Published online in the Proceedings of the 5th Annual iSchool Conference (University of Illinois at Urbana-Champaign, IL, February 3-6, 2010), 5 pages. [Link](#)
- (b) Maglio, P. P., Vargo, S., Caswell, N., & Spohrer, J. (2009). The service system is the basic abstraction of service science. *Information Systems & e-Business Mgmt*, 7, 395-406. [Link](#)
- (c) Lyons, K. & Tracy, S. (2013). Characterizing organizations as service systems. *Human Factors and Ergonomics in Manufacturing*, 23, 1927. doi: 10.1002/hfm.20517. [Link](#).

12. Presentation session:

**** Assignment 2 due:** each group will be given 10 minutes to present their projects. Further details will be given closer to that day.

**** Please note that confidential self and peer assessment forms evaluation forms are due. Forms should be submitted independently by each group member in a sealed envelope.**

Learning Outcomes

Students will learn to design and oversee information systems, services, and practices, based on an understanding of the power, limitations, and interrelatedness of four themes:

1. Architecture: The principles, organizational structures, communication protocols, and inter-change & interoperability standards of contemporary information systems;
2. Information: the nature, organization, analysis, storage, use and dissemination of information in the context of information systems and services;
3. Design: The role of abstraction, formalization, modeling, standards, protocols, and tools in the complex process of contemporary information system design.
4. Use: The ways in which people define, conceptualize, develop, evaluate, adapt, evolve and sustain information systems, including the role of users, the relation to management and organization, and aspects of work flow

Relationship to Masters of Information (MI) Program-Level Student Learning Outcomes

Master of Information Program-Level Student Learning Outcomes can be found [here](#).

Information Systems surround our everyday life. Many of us are or will be interacting with a complex information system in a work or personal situation. INF1003H is a fundamental course that defines Information Systems and gives an overview of their components and use inside organization. This course will help students to become conversant with Information Systems fundamentals and theories (**Outcome 1**). Given the case studies and practical assignment in this course, the students will develop an understanding of the development of theory concerning information, where it is

found, and how it is used (**Outcome 4**). Finally, the course will allow students to develop their own goals and continue in life-long intellectual growth beyond graduation (**Outcome 6**).

General Expectations

1. **Communication Policy:** Please do not email questions to the instructors or TAs. If you have a question, there is a pretty good chance that other people in the course have the same question or, at least, will benefit from the answer. Please post all the questions to Blackboard (forum threads to be announced) so everyone in the course can benefit from your questions and our answers. Questions posted to Blackboard will be answered within two (2) business days. Students are encouraged to post answers to the questions of other students where appropriate.
IMPORTANT: Please prefix the subject of your emails to the instructor and TA with "INF1003H" and include some more details, e.g., "INF1003H: book appointment October 1st".
2. **Readings:** It is important to complete the required readings before the lecture in order to fully benefit from the class activities.
3. **Late policy:** Late submission of an assignment carries a penalty of one grade (e.g. from B+ to B) for each week, to a maximum of two weeks; submissions will not be accepted after two weeks. Exceptions will be made only when supported by appropriate documentation.
4. **Academic Integrity:** The essence of academic life revolves around respect not only for the ideas of others, but also their rights to those ideas and their promulgation. It is therefore essential that all of us engaged in the life of the mind take the utmost care that the ideas and expressions of ideas of other people always be appropriately handled, and, where necessary, cited. For writing assignments, when ideas or materials of others are used, they must be cited. You may use any formal citation format, as long as it is used consistently in your paper, the source material can be located and the citation verified. What is most important is that the material be cited. In any situation, if you have a question, please post it to Blackboard. Such attention to ideas and acknowledgment of their sources is central not only to academic life, but life in general. Please acquaint yourself with UofT's [Code of Behaviour on Academic Matters](#).
5. **Participation and Attendance:** Discussion and interaction in the classes are important ways to learn. Sharing your experiences and ideas with your classmates is central to your learning experience in this course. As such, you should attend and participate in every class. There will also be exercises and discussions that you will participate in within your groups in your class. Some of the activities will be very helpful in completing your assignments.
6. **Students with Special Needs or Health Considerations:** All students are welcome in this course and we will make every effort to ensure a meaningful, respectful, and positive learning experience for everyone. If there are special considerations that you require to help you successfully fulfill the requirements of the course, please feel free to see one of the instructors, the Faculty of Information [Student Services](#), and/or contact the [Accessibility Student Office](#) as soon as possible so we can ensure you are able to successfully meet the learning objectives for this course.



- 7. Writing Resources:** Please review the material you covered in Cite it Right, familiarize yourself with the [How Not to Plagiarize](#) site and [UofT's policy](#), and consult the [Office of English Language and Writing Support](#) as necessary.