Faculty of Information • University of Toronto

INF2183 • Knowledge Management & Systems

Instructor: Prof. Eric Yu.
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eric dot yu at utoronto dot ca  start email subject line with [2183]
(I will answer questions posted on the Blackboard forum “Questions to Instructor”. Please use that instead of email for all questions related to this course.)
Lectures: Thursdays, 6:30 – 9:30 pm. Room BL313  (January - April 2017)
Office hours: Mondays 4-5:30 pm
Teaching Assistant: Soroosh Nalchigar

Course Description

Knowledge management from an information systems perspective. Analyzing information and knowledge processes in organizations. Explicit and implicit/tacit knowledge in software systems and in human social systems. Languages and models for codifying knowledge. Application of information technologies to knowledge management. Ontologies and the semantic web. Knowledge management in information systems development. Applications in selected areas such as enterprise management, e-commerce, healthcare, media, and education.

Course Objectives

Information systems professionals are increasingly called upon to help manage knowledge in organizations, beyond conventional information processing. A wide range of information technologies, such as collaboration and social software, enterprise repositories, knowledge-based or expert systems, software agents, as well as traditional information systems, are being used to support work in organizations. This course examines knowledge management from an information systems perspective. Notions of knowledge in the management literature and in the information systems area are reviewed. Modelling techniques that can be used during systems analysis in the context of organizational knowledge management are examined. The course aims to expose students to the issues of knowledge management in organization and across communities, and to provide opportunities to learn and apply modelling and analytical techniques to understand the use of various types of information technologies in meeting organizational knowledge management needs.

Scope

The theme of knowledge management is treated in a number of courses at the iSchool. This course focuses on knowledge management from an information systems perspective.
Course Learning Outcomes

At the end of this course, students should be able to:

- analyze and identify knowledge management needs in organizational settings (demonstrated in Assignment 2 and through in-class activities)
- apply modeling techniques to analyze organizational processes from a knowledge management perspective as well as information systems perspective (demonstrated in Assignment 2 and through in-class activities)
- analyze and identify potential IT systems solutions to address knowledge management needs (demonstrated in Assignment 3 and through in-class activities)
- explain and illustrate potential application of ontologies in the context of knowledge management. (demonstrated in Assignment 3 and through in-class activities)
- describe and explain knowledge management concepts in relation to the application of information technologies and systems (demonstrated in Assignment 1 and through in-class activities; reviewed through mid-term test)

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

This course introduces students to knowledge management concepts and relates them to information systems concepts and practices (Outcome 1). Through a practical project (Assignments 2 and 3) and class discussion of project experiences from multiple diverse settings, students develop knowledge and values that will prepare them for future professional practice (Outcome 2). Through readings, class presentations and discussions (Assignment 1), students are exposed to a broad range of theories about knowledge management (Outcome 4) and how KM concepts can contribute to the understanding of the emergence and evolution of various information technologies and systems practices (Outcome 5). By encouraging and enabling students to interpret advances in information technologies and systems practices through KM perspectives, students are equipped for life-long intellectual growth throughout their future careers (Outcome 6).

Pre-requisites

INF1341 Systems Analysis and Process Innovation, or permission of instructor. For iSchool students specializing in Information Systems & Design, the sequence INF1341, INF1342, INF2177, INF2183 is recommended.

Course Topics and Schedule

Schedule is approximate and may be adjusted. Additional readings may be assigned. Most readings are available online via UofT digital library.

A(n) -- Numbered items with an ‘A’ or ‘B’ prefix are to be presented and discussed by a student as Assignment 1.
Week 1 (Jan 12): Course overview. Overview of knowledge management, motivations, current perspectives, examples, relationships to current issues in information systems and other information disciplines.

Readings:

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Supplementary:


Week 2 (Jan 19): Knowledge management from Information Systems perspectives.

Readings:

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Supplementary:


Readings:

**Model of Dynamic Knowledge Creation.** *Long range planning,* 33(1): 5-34.


Supplementary:


Readings:
- review of modelling techniques from INF1341 - DFD, ER, OO, i*. For i* Strategic Actor Relationships modelling, see guide to readings on i*.

Supplementary:

**Week 5** (Feb 9): Information technologies for knowledge management. The role of various ITs from knowledge management perspectives. Groupware, intranets and portals, document and
content management, classification and search. Knowledge-based systems, knowledge acquisition and engineering, knowledge sharing among knowledge bases. Data mining and knowledge discovery, information extraction.

Readings:


Supplementary:

Assignment 2 due Thursday Feb 16.

**Week 6** (Feb 16): **Knowledge management from technology perspectives.** Knowledge in information systems. Semantic representation in data and software. The movement towards knowledge orientation in information and software systems. The semantic web, ontologies, software agents. Semantic interoperability.

Readings:


Supplementary:

### Reading week - no class on Feb. 23

**Week 7 (Mar 2): Mid-Term Test; Semantics; Semantic web; Knowledge in systems development.**

Readings:


Supplementary:

Semantics and semantic web:


Readings for discussion:


Supplementary:

Week 9 (Mar 16): Knowledge and management, cont'd.

Readings for discussion:


Supplementary:

**Week 10** (Mar 23): **Knowledge management analysis of IS development issues.** (Student presentations and discussions)
Selected topics may include: open source software development, agile methods, design rationales, requirements traceability, software reuse, design patterns, process improvement, etc. For presentation topics and readings, see "Knowledge Management in Information Systems Development" section (the “B series”) under References.

**Week 11** (Mar 30): **Knowledge management and systems in selected application areas.**
Student project presentations (Asg 3P) and discussions. Application areas may include, but are not limited to:

- Healthcare
- Enterprise management
- E-business
- Education and e-learning
- Scholarly research, publishing, and digital libraries
- Product development and engineering
- Consultancy

**Week 12** (Apr 6): **Knowledge management in selected application areas.** (cont'd)

Assignment 3W due Friday Apr 7, 4pm.

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**Course requirements**

**Assignment 1:** [15%] Presentation on selected readings. (individual work)
The presenters will summarize and present highlights from the selected reading(s) and raise questions for class discussion in relation to the objectives and themes of the course. The presenters will present for 15 minutes, followed by a discussion period of 15 minutes. Everyone in the class is expected to have read all the required readings before class. A written report is not required. The presentation dates are distributed throughout the term. You must sign up to select readings from the A-series or the B-series at beginning of term. Presentation slides are to be submitted 48 hours before the class designated for that reading, by posting on Blackboard.

**Assignment 2:** [20%] Analyzing knowledge management needs. (4-person teams)
Select an application domain area. Select an organizational setting in this domain. Apply appropriate analytical frameworks and modelling techniques to study, from a knowledge management perspective, the problems and opportunities in the selected setting. Identify
knowledge management needs. The analysis will include existing information technology
systems, if any. Interactions among technology and human social systems must be fully
considered. Future knowledge management needs and issues arising from internal and external
changes should also be considered.
The setting may be based on actual site studies, or constructed from the literature (e.g., a
composite of published case studies). The scope of the setting should include several work
groups or communities with some interactions from a knowledge point of view. These may
involve groups or communities outside the organization. Alternatively, with approval from the
instructor, the study may analyze selected knowledge practices within an application domain or
industry sector, e.g., evidence-based medicine, or the role of patents in knowledge creation and
dissemination.
A written report is required. (approx. 3000 words + figures and references, single-spaced 12pt
font.)

Assignment 3: Identifying IT systems solutions to address knowledge management needs. (4-
person teams)
The team will select one study site from among those studied by team members in Assignment 2.
From the knowledge management needs identified in Assignment 2, select appropriate
technologies to meet those needs. The selected technologies should complement each other so
that together they meet the overall needs. State assumptions about organizational and technology
architectures, if any. Consider issues of interoperability and evolution from a knowledge
perspective. Consider the applicability of ontologies. Provide at least one example of the need to
support multiple ontologies. Define the requirements for the various technology systems in the
context of the organizational setting. Use appropriate documentation and modelling techniques.
Interactions among technology and human social systems must be fully considered.
Report: [20%] A written report is required. (approx. 4000 words, plus figures and references,
single-spaced 12pt font )
Presentation: [10%] An in-class presentation (Week 11 or 12, 15 minutes per team), to be
followed by designated discussants, then open discussion. There will be team and individual
marks. Detailed presentation slides are to be submitted the day before the presentation (24 hours
before start of class), by posting onto Blackboard.

Mid-Term Test: [15%] This will be an in-class closed-book written test that covers material up
to the preceding class. It is expected to consist of 8-10 short questions that can be answered in a
few sentences. No aids allowed. Duration 40 minutes.

Online discussion: [10%]
(1) Each student is expected to contribute to online discussions on course topics and readings on
Blackboard. A rough guide is that each student will contribute at least two (2) thoughtful posts
over the duration of the term. You are also expected to comment on each other’s postings, to
share and jointly create knowledge.
(2) In addition, you are expected to comment on: (option a) two of the final project presentations,
noting especially the strengths and limitations of particular methods and techniques for analyzing
knowledge management needs and the use of technologies and systems to address those needs,
as demonstrated by other project teams, OR (option b) one project presentation, and one of the
B-series presentations.
In-class participation: [10%] Class attendance and participation in discussions is mandatory.

Peer assessment of contributions by team members is required for all team work and is considered part of the participation grade. In team work assignments, grades for individual members may differ.

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Textbook none.

References
See readings for each week in the above schedule.

- Healthcare and medicine
  - OpenClinical – knowledge management for healthcare
  - Unified Medical Language System (UMLS)

- Education and learning
  - IEEE P1484.12 Learning Object Metadata Working Group
  - IMS Global Learning Consortium.

- E-business
  - RosettaNet.org, see especially Partner Interface Processes (PIP) specifications.

- Scholarly research and publishing


**Scholarly Ontologies Project**

**Consultancy**


**Enterprise and project management**


**Knowledge Management in Information Systems Development (“B series” of readings for selection for Assignment 1)**

**B1. Open source software development**


**Supplementary:**


**B2. Managing experience**


Supplementary:


**B3. Traceability**


Supplementary:


**B4. Software reuse**


Supplementary:


• **B5. Design rationales**
  Supplementary:

• **B6. COTS-based software development**
  Supplementary:

• **B10. Agile software development methods**
  Ambler, Scott - *Agile Model Driven Development* (AMDD): The Key to Scaling Agile Software Development.

• **B11. Software ecosystems**
  Supplementary:

• **B12. Business intelligence and analytics**
  Supplementary:

• **B13. Data science and big data**

• **B14. DevOps and continuous delivery**

• **Other topics of interest**
  o **B7. Design patterns**
  o **B9. Business rules**
  o **B15. Cognitive computing**
  o **B16. Sentiment analysis and text mining**

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**Grading**


**Late Policy**

There will be a penalty of half a letter grade for every 24 hour period an assignment is submitted after the due date and time. For example, a B+ becomes a B/B+ if submitted one minute after the due date and time, a B if submitted 24 hours after. Requests for extensions will only be considered for medical reasons with doctor's note. Assignments will not be accepted one week after the due date.

**Writing Support**

As stated in the iSchool’s Grade Interpretation Guidelines, “work that is not well written and grammatically correct will not generally be considered eligible for a grade in the A range, regardless of its quality in other respects.” With this in mind, please make use of the writing support provided to graduate students by the SGS Office of English Language and Writing Support ([http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx](http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx)). The services are designed to target the needs of both native and non-native speakers and all programs are free. Please consult the current workshop schedule ([http://www.sgs.utoronto.ca/currentstudents/Pages/Current-Years-Courses.aspx](http://www.sgs.utoronto.ca/currentstudents/Pages/Current-Years-Courses.aspx)) for more information.

**Academic integrity**

Please consult the University’s site on Academic Integrity ([http://academicintegrity.utoronto.ca/](http://academicintegrity.utoronto.ca/)). 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 ([http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppju11995.pdf](http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/ppju11995.pdf)). You should acquaint yourself with the Code. Please review the material in Cite it Right and if you require further clarification, consult the site How Not to Plagiarize ([http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize](http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize)). Cite it Right covers relevant parts of the U of T *Code of Behaviour on Academic Matters* (1995). It is expected that all iSchool students take the Cite it Right workshop and the online quiz. Completion of the online Cite it Right quiz should be made prior to the second week of classes. To review and complete the workshop, visit the orientation portion of the iSkills site: [uoft.me/iskills](http://uoft.me/iskills).

**Accommodations**

Students with diverse learning styles and needs are welcome in this course. If you have a disability or a health consideration that may require accommodations, please feel free to approach me and/or the Accessibility Services Office ([http://www.studentlife.utoronto.ca/as](http://www.studentlife.utoronto.ca/as)) as soon as possible. The
Accessibility Services staff are available by appointment to assess needs, provide referrals and arrange appropriate accommodations. The sooner you let them and I know your needs, the quicker we can assist you in achieving your learning goals in this course.

**Acknowledgement of Traditional Land**

“I (we) would like to acknowledge this land on which the University of Toronto operates. For thousands of years it has been the traditional land of the Huron-Wendat, the Seneca, and most recently, the Mississaugas of the Credit River. Today this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.”

See also, the Faculty of Information’s Commitment to the Findings And Call for Action of the Truth and Reconciliation Commission (approved at the Feb. 4, 2016 Faculty Council):


Last updated 2017-03-26

[Reading List Service provided and links accessed by the Information Services Unit at the Inforum: Winter term, 2016-2017]