**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)

Pre-requisites

INF1341 Systems Analysis and Process Innovation, or permission of instructor. For iSchool students specializing in Information Systems, the sequence 1341, 1342, 2177, 2183 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 7): 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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<th>Reading</th>
<th>Publication Details</th>
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Supplementary:

**Week 2** (Jan 14): **Knowledge management from Information Systems perspectives.**

Readings:

| Grover, Varun, and Thomas Davenport (2001) **General Perspectives on Knowledge Management: Fostering a Research Agenda.** J. Management Information Systems. 18(1) Summer. 5-21. |

Supplementary:


Readings:


Supplementary:


Readings:

| review of modelling techniques from INF1341 - DFD, ER, OO, i*. For i* Strategic Actor Relationships modelling, see guide to readings on i*. |
| A5 Noy, Natalya F., and Deborah L. McGuinness (n.d.) **Ontology Development 101: A guide to creating your first ontology.** |


Supplementary:

**Week 5 (Feb 4): 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:

**Week 6 (Feb 11): 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:
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**Supplementary:**

Asg 2 due Friday Feb 13.

**Reading week - no class on Feb. 18**

**Week 7 (Feb 25): Semantics; Semantic web; Knowledge in systems development.**

**Readings:**

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**Supplementary:**
- Semantics and semantic web:
• Anupriya Ankolekar, Katia P. Sycara, James D. Herbsleb, Robert E. Kraut, Christopher A. Welty: Supporting online problem-solving communities with the semantic web. WWW 2006: 575-584

Knowledge in system development:


Readings for discussion:

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Supplementary:

Week 9 (Mar 11): Knowledge and management, cont'd.

Readings for discussion:


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Supplementary:


**Week 10 (Mar 18): 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 25): 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 1): Knowledge management in selected application areas.** (cont'd)

Asg 3W due Friday Apr 3, 2pm.

**Course requirements**

The course will be conducted in a seminar style with discussion of readings and a major project.
Assignment 1: [15%] Presentation OR short discussion paper on selected readings. (Individual work)
(1) Presentation Option: The presenter 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 presenter will present for 15 minutes, followed by a discussion period of 15-20 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.
(2) Short Paper Option: Instead of presentation, you will write a short paper (1500-2000 words, 3-4 pages) highlighting key points from the selected reading(s) and raising questions for discussion (in-class or online) in relation to the objectives and themes of the course.

You must sign up to select readings from the A-series or the B-series at beginning of term. Presentation slides or short paper are to be submitted 24 hours before the class designated for that reading, by posting on Blackboard.

Assignment 2: [25%] Analyzing knowledge management needs. (2-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: [25%] A written report is required. (approx. 4000 words + figures and references, single-spaced 12pt font)
Presentation: [10%] An in-class presentation (Week 11 or 12, 25-30 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, by posting onto Blackboard.

Online discussion: [15%] Each student is expected to participate in online discussions on course topics and readings on Blackboard. You are expected to comment on each other’s postings, to share and jointly create knowledge. A rough guide is that each student will contribute at least 3 thoughtful posts over the duration of the term. In addition, you are expected to comment on 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. Alternatively, you may comment on 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.

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.

Plagiarism
Plagiarism is a serious offence. Offenders will be prosecuted. See U of T SGS Calendar and Faculty policies. All sources must be cited fully and properly. Students are expected to have attended the "Cite it right" workshop offered by the Inforum.

Normally, students will be required to submit their course essays electronically to Turnitin.com for review of textual similarity and detection of possible plagiarism. In doing so, students will allow essays to be included as source documents in the Turnitin.com database, where they will be used solely for the purpose of detecting plagiarism. Turnitin.com services are described on the Turnitin.com website.

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**)


• Barry Smith et al. (2007) **The OBO Foundry: coordinated evolution of ontologies to support biomedical data integration**, Nature Biotechnology 25, 1251 - 1255


• **Education and learning**
  
  o IEEE P1484.12 **Learning Object Metadata Working Group**
  
  o **IMS Global Learning Consortium**.

• **E-business**


  o **RosettaNet.org**, see especially Partner Interface Processes (PIP) specifications.


• **Scholarly research and publishing**


  o **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
Scott Ambler - Agile Model Driven Development (AMDD): The Key to Scaling Agile Software Development.
• **B11. Software ecosystems**
  Supplementary:

• **B12. Business intelligence and analytics**
  Supplementary:
    o Barbara H. Wixom; Hugh J. Watson; Anne Marie Reynolds; Jeffrey A. Hoffer. *Continental Airlines Continues to Soar with Business Intelligence*, Information Systems Management (March 2008), 25 (2), 102-112

• **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

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**Writing support**
Please review the material you covered in the Cite it Right workshop [http://www.ischool.utoronto.ca/content/view/1375], familiarize yourself with this site [http://www.utoronto.ca/writing/plagsep.html] (about plagiarism) and UofT's plagiarism policy [http://www.sgs.utoronto.ca/current/plagiarism.asp], and consult the SGS writing centre [http://www.sgs.utoronto.ca/english/oneonone.asp] or the UC writing centre [http://www.utoronto.ca/writing/], if necessary.

**Academic integrity**

**Students with a disability or health considerations**
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 me and/or the Accessibility Services Office.
[http://www.studentlife.utoronto.ca/accessibility.htm] as soon as possible. The Accessibility Services staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. The sooner you let them and me know your needs, the quicker we can assist you in achieving your learning goals in this course.

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