

# **SYSC 5801T**

## **ADVANCED TOPICS IN COMPUTER- COMMUNICATIONS: WEB 2.0 (COLLECTIVE WEB)**

**Winter 2010**

**Department of Systems and Computer Engineering  
Carleton University**

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This course outline is a living document. Improvements Version 0.1  
may be made as necessary during the term.

### **Instructor availability**

The instructor is available via e-mail any time. Office hours by appointment (online/offline).

### **Calendar description**

SYSC 5801T [0.5 credit] Advanced Topics in Computer Communications: Web 2.0

User participation (tagging), network effects (platforms, N-sided markets, collective intelligence), social media (social networks, blogs, wikis), mashups (programmable web, syndication), innovation ecosystems (recombinant innovation, mashup ecosystem), sensemaking (visualization, collaborative analytics), open APIs (REST, communication-enabled applications), and open content (control, licensing).

Prerequisites: TTMG 5001

### **Course objectives**

This course examines how to innovate in a Web 2.0 world. Unlike the Web 1.0 that preceded it, Web 2.0 emphasizes collaboration, openness, and participation. In a Web 2.0 world, the difference between information producers and consumers has essentially disappeared, turning the Web (finally, we should add) into a read/write medium. We will explore new ways that users can collaborate through blogs and wikis, and by recombining information into mashups. We will examine the implications of open communication between users (companies and individuals alike), and study the new business models enabled by user participation.

Problem definition, hypotheses formulation, methods to collect and examine data, and the identification of insights relevant to academics and practitioners are key components of this course.

### **Rationale**

Many courses focus on the mechanics of Web 2.0 technologies. This course takes a broader perspective and examines what opportunities Web 2.0 presents in terms of new business models, new forms of social interaction, and new ways of sharing and reusing information. However, these opportunities also come with risks and unresolved issues. Our goal is, therefore, also to identify open issues that research on Web 2.0 needs to address.

### **Benefits**

Students will benefit from:

- understanding the literature on Web 2.0 technologies and business models
- knowing how to apply lightweight approaches to sensemaking
- developing skills in making, assessing and communicating recommendations on how to create new business opportunities from Web 2.0 technologies
- using Web 2.0 collaboration technologies to create a product

## Class Sessions

This course is offered in-class as well as online. Remote students can participate by logging into conference room 85801 with password "student" at <http://present.sce.carleton.ca>. For audio call into our conference server at 613-520-7610 (Ottawa) or 1-866-520-2505 (toll-free), and enter the room number when prompted. You can also connect via the VOIP feature from within the web conferencing system by clicking on the headphones icon at the top of the window. Support for the VOIP feature is still experimental, but it requires no access to a phone.

Please see the tutorials on participating in an online classroom on the [present.sce.carleton.ca](http://present.sce.carleton.ca) site.

For the weekly sessions there will be assigned readings and tasks. I will also be inviting local Web 2.0 entrepreneurs as guest speakers to give short presentations on their vision of Web 2.0.

During the student group presentation sessions, groups will be asked to make short presentations on their assignments (max. 10 minutes; please practice so you stay on time). Each group decides who presents what and in which order. Before 5 p.m. EST the day prior to when presentations are due, each group will distribute to all members of the class the slides to be presented the next day. No exceptions.

The course material and recordings of the class sessions will be made available on the Moodle learning content management system at <http://cms.sce.carleton.ca>. If you don't have an account contact the instructor.

## Student Evaluation

Course participants are required to complete two group assignments and participate actively in class (discussion and assigned tasks). To determine the course grade, these weights apply:

- Assignment 1 (group)                      40%  
50% of your mark will be based on your contributions to the wiki, and 50% on peer evaluation
- Assignment 2 (group)                      30%  
Only the final version of the presentation will be graded and is worth 10%
- Class participation                              30%

Assignments submitted late and presentations not made will receive a grade of zero. All students in a group receive the same grade. The mark of assignment 1 is composed of a mark given to all students and a mark based on peer evaluation. Final grade reports will follow Carleton University guidelines.

## Assignment 1

This is a group assignment. Groups should be approximately equal in size.

Collaborate on a book on how Web 2.0 changes innovation. Groups can sign up of a chapter of the book at the beginning of the course. The assignment is first-come first-served. Ties will be broken by the instructor. Each class session will result in a chapter of the book. Students use a wiki to author chapters in three stages:

1. In the first phase, only students within the group contribute to the chapter. Students are also expected to expand on the class discussion by reviewing five additional papers and integrating the insights gained into the chapter. This phase ends one week after the class on which the chapter is based.
2. In the second phase, each group will comment on the chapters authored by the previous group using the discussion pages of the wiki (the first group reviews the chapters of the last group). Students can also edit the wiki pages of the other group directly, but only after documenting their rationale for the change in the discussion page. Check the WikiWikiWeb article on WikiGnomes for suggestions on make constructive edits (<http://c2.com/cgi/wiki?WikiGnome>). This phase takes one week.
3. In the third phase, groups will update their chapters by integrating the feedback into their chapter. This phase takes another week. At the end of this phase the final version of the chapter is due.

This year's students will not start from scratch but build on the chapters written by students in the last course. It is therefore also expected that you make improvements to your chapter:

- structure and organization (clearly identify the learning objectives of the chapter, end the introductory page with a one paragraph chapter outline, and add study questions at the end of a chapter)
- edit the chapter for writing style (improve readability, turning the chapter it into something that you

- would like to read, and less into a literature review)
- improve the flow of the chapter by better connecting the ideas in the chapter
- enrich the chapter with examples that demonstrate the concepts
- update the content reflecting changes in the lectures and new findings from the literature
- make corrections where necessary

On the discussion page associated with the chapter also keep track of the major changes to the existing chapter. This should be somewhat like release notes you that accompanies a new version of a piece of software.

Chapter format: learning objectives, chapter outline, body of chapter, questions, references. Copy and paste from other websites is not acceptable. You must restate the work of others in your own words. The same holds for figures. Unless these figures have been made available under a license that allows reuse (eg Creative Commons), you need to either obtain permission from the publisher (difficult and expensive!) or recreate the figure.

Instructor will provide a template chapter that illustrates the format and the main techniques of using a wiki that incorporates the lessons learned from the previous class.

For other examples of books written using a wiki check out the WikiBooks initiative ([http://en.wikibooks.org/wiki/Wikibooks:Guidelines\\_for\\_class\\_projects](http://en.wikibooks.org/wiki/Wikibooks:Guidelines_for_class_projects)) and the Global Text Project (<http://globaltext.terry.uga.edu/>).

## **Assignment 2**

This is a group assignment. These can be different groups. I expect around 8 projects.

Propose the concept for a new Web 2.0 business opportunity. Document the customer value proposition: what is new about the business opportunity, and what are its points of difference for different types of customers with regard to existing offers. Include your rationale for selecting the concept: identify potential concepts and show the criteria you used to rank them. The deliverables of this assignment are two presentations (the first version will not be marked, but is used to provide you with feedback on your concept), and a report (maximum of 5 pages). The presentation should follow the template supplied by the instructor and be in PDF format.

Links: Anderson, J. C., Narus, J. A., & van Rossum, W. 2006. Customer value propositions in business markets. *Harvard Business Review*, 84(3): 90-99.

Presentation of first version due: February 24, 2009

Presentation of final version and submission of a report (maximum 5 pages) due: April 7, 2009

## **Class participation**

Active class participation is an important component of this class:

1. Participation in class discussions (contribute to lessons learned at the end of each class, lead a discussion, provide feedback on the assignments of your classmates)
2. Start discussions on four topics related to the class material and post them to the wiki, and contribute to four discussions created by others. The contributions are evaluated based on their significance.
3. Write four glossary entries on key concepts and post them to the course glossary.
4. Contribute at least three postings to the course blog with examples of Web 2.0 websites or services, and tag your posts. The tags will appear in a tag cloud on the course website.

## **Group work and free loaders**

Group work is an important component of this course. You may elect to work in the same group to prepare both assignments or work in two different groups. Group conflicts are to be dealt with by the group in a way that is fair, fast and without personal attacks. The instructor does not settle group disputes.

The instructor will dissolve a group that is late submitting an assignment. A group of three is expected to deliver better work than a group of two.

Free loaders are not welcome anywhere. This course is no exception. The best way to deal with free loaders is to not include their names in the first page of the group assignments. If a student's name does not appear in an assignment submitted by his or her group, the student must submit his or her own assignment. Failure to do so,

the student will receive zero for the assignment. There is zero tolerance for free loaders.

### Students with disabilities

Students with disabilities who require academic accommodations in this course are encouraged to contact the Paul Menton Centre (PMC) for Students with Disabilities to complete the necessary forms. After registering with the PMC, make an appointment with me in order to discuss your needs at least two weeks before the first assignment is due. This will allow for sufficient time to process your request

### Plagiarism

Plagiarism (copying and handing in for credit someone else's work) is a serious instructional offence that will not be tolerated. Please refer to the section on instructional offences in the Graduate Calendar for additional information. Plagiarism is against the TIM culture. A case of plagiarism will be referred to the Chair of the Department and the Carleton University Ethics Committee. The instructor will not deal with the matter directly. The university has clear processes to deal with students who are suspected of plagiarism.

### Administrative details

These are the rules of conduct for this course:

- Please notify the instructor via e-mail if you will not attend a class.
- You must be prepared for each class. You do so by reading the material assigned and being prepared to discuss in class how what was read can be applied in product development organizations.
- Each presenter must make his/her slides available to all other students by noon the day before.

### Web 2.0 (Collective Web): Schedule

Date	Topic	Readings
Jan 6	Session 1: Introduction	<ul style="list-style-type: none"> <li>• Course outline</li> </ul>
Jan 13	Session 2: Concepts	<ul style="list-style-type: none"> <li>• Lee et al. (2008)</li> <li>• McAfee (2006)</li> <li>• Musser &amp; O'Reilly (2006)</li> <li>• Zittrain (2007)</li> </ul>
Jan 20	Session 3: User participation	<ul style="list-style-type: none"> <li>• Chapter 1 in: Shuen (2008)</li> <li>• Cook (2008)</li> <li>• Chapter 3 in: Leadbeater (2009)</li> <li>• Marlow et al. (2006)</li> </ul>
Jan 27	Session 4: Network effects	<ul style="list-style-type: none"> <li>• Chapter 2 in: Shuen (2008)</li> <li>• Evans (2009)</li> <li>• Eisenmann (2008)</li> <li>• Gruber (2008)</li> </ul>
Feb 3	Session 5: Social media	<ul style="list-style-type: none"> <li>• Chapter 3 in: Shuen (2008)</li> <li>• Boyd &amp; Ellison (2007)</li> <li>• Van Alstyne &amp; Brynjofssen (2005)</li> <li>• Java et al. (2009)</li> </ul>
Feb 10	Session 6: Mashups	<ul style="list-style-type: none"> <li>• Chapter 4 in: Shuen (2008)</li> <li>• Mashup Pattern in: Governor et al. (2009)</li> <li>• Balasubramaniam et al. (2008)</li> <li>• Yu et al. (2008)</li> <li>• Chapter 9 in: Yee (2008)</li> </ul>
Feb 17	Winter break	
Feb 24	Session 7: Present first version of assignment 2	

Mar 3	Session 8: Enterprise 2.0	<ul style="list-style-type: none"> <li>• Hoyer &amp; Fischer (2008)</li> <li>• Chapter 7 in Ogrinz (2009)</li> <li>• Lee et al. (2009)</li> </ul>
Mar 10	Session 9: Innovation ecosystems	<ul style="list-style-type: none"> <li>• Chapter 5 in: Shuen (2008)</li> <li>• Iyer &amp; Davenport (2008)</li> <li>• Hagel et al. (2008)</li> <li>• Weiss &amp; Gangadharan (2010)</li> </ul>
Mar 17	Session 10: Sensemaking	<ul style="list-style-type: none"> <li>• Heer &amp; Agrawala (2008)</li> <li>• Pirolli (2009)</li> <li>• Huynh et al. (2007a)</li> <li>• Huynh et al. (2007b)</li> </ul>
Mar 24	Session 11: Design of open APIs	<ul style="list-style-type: none"> <li>• Chapter 12 in: Yee (2008)</li> <li>• Fielding &amp; Taylor (2002)</li> <li>• Gamble &amp; Gamble (2008)</li> <li>• Vermeulen et al. (2007)</li> </ul>
Mar 31	Session 12: Open content	<ul style="list-style-type: none"> <li>• Karaganis (2008)</li> <li>• Chapter 6 in: Bollier (2008)</li> <li>• Gangadharan et al. (2008)</li> </ul>
Apr 7	Present final version of assignment 2 Assignment 2 document due	<ul style="list-style-type: none"> <li>• Lessons learned from the course</li> </ul>

## Readings

To access the required journal articles in electronic form, go to: <http://www.library.carleton.ca>, and click on “Journals & Journal Articles”. Enter the name of the journal, and click “Search”. Click on the link (there may be several), and enter your barcode number and PIN. For material on the Web, the URL is provided.

The “In depth” and “Examples” sections contain further reading which is optional.

### Readings for Session 2

Lee, S.-H., DeWester, D., & Park, S. (2008), Web 2.0 and opportunities for small business, *Service Business*, 2(4), 335-345.

McAfee, A. (2006), Enterprise 2.0: the dawn of emergent collaboration, *MIT Sloan Management Review*, 47(3), 21-28.

Musser, J., & O'Reilly, T. (2006): *Web 2.0: Principles and Best Practices*, O'Reilly Radar, 10-54.

Zittrain, J. (2007), Saving the Internet, *Harvard Business Review*, June, 49-59.

In depth: Zittrain, J. (2008), *The Future of the Internet*

### Readings for Session 3

Shuen, A. (2008), Users Create Value, Chapter 1, 1-38.

Cook, S. (2008), The contribution revolution: let volunteers build your business, *Harvard Business Review*, October, 60-69.

Leadbeater, C. (2009), How we-think works (and not), Chapter 3, 61-87

Marlow, C., Naaman, M., Boyd, D., & Davis, M. (2006), HT06, tagging paper, taxonomy, Flickr, academic article, ToRead, *CHI*.

Examples: Yee, R. (2008), Understanding Tagging and Folksonomies, Chapter 3, 61-75.

### Readings for Session 4

Shuen, A. (2008), Networks Multiply Effects, Chapter 2, 39-67.

- Evans, D. (2009), How catalysts ignite, forthcoming in Gawer, A. (ed.), *Platforms, Markets and Innovation*, Edward Elgar, <http://ssrn.com/abstract=1279631>.
- Eisenmann, T. (2008), Managing proprietary and shared platforms, *California Management Review*, 50(4), 31-53.
- Gruber, T., Collective knowledge systems: where the social web meets the semantic web, *Web Semantics: Science, Services, and Agents*, 6, 4-13.

#### *Readings for Session 5*

- Shuen, A. (2008), People build connections, Chapter 3, 69-105.
- Boyd, D., & Ellison, N. (2007), Social network sites: definition, history, and scholarship, *Journal of Computer-Mediated Communication*, 13(1), 11, <http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html>.
- Van Alstyne, M., & Brynjolfsson, E. (2005), Global village or cyber-balkans? Modeling and measuring the integration of electronic communities, *Management Science*, 51(6), 851-868.
- Java, A., Song, X., Finin, T., & Tseng, B. (2009), Why we twitter: an analysis of a microblogging community, *Advances in Web Mining and Web Usage Analysis*, LNCS 5439, Springer, 118-138.
- In depth: Marlow, C. (2005), *The Structural Determinants of Media Contagion*, Master's Thesis, MIT.

#### *Readings for Session 6*

- Shuen, A. (2008), Companies Capitalize Competences, Chapter 4, 107-128
- Governor, J., Hinchcliffe, D., & Nickull, D. (2009), Mashup Pattern, in: Chapter 7, 151-158.
- Balasubramaniam, S., Lewis, G., Simanta, S., & Smith, D. (2008), Situated software: concepts, motivation, technology, and the future, *IEEE Software*, November/December, 50-55
- Yu, J., Benatallah, B., Casati, F., & Daniel, F. (2008), Understanding mashup development, *IEEE Internet Computing*, September/October, 44-52,
- Yee, R. (2008), Moving from APIs and Remixable Elements to Mashups, Chapter 9, 227-242.
- Examples: Mahemoff et al. (2007), Flickr and Google Maps mashups, Chapter 7, 217-250.

#### *Readings for Session 8*

- Hoyer, V., & Fischer, M. (2008), Market overview of enterprise mashup tools, *International Conference on Service Oriented Computing (ICSOC)*, LNCS 5364, Springer, 708-721.
- Ogrinz, M. (2009), Manage Patterns, Chapter 7.
- Lee, S., Olson, D.L., & Lee, S.-H. (2009), Open process and open source enterprise systems, *Enterprise Information Systems*, 3(2), 201-209.
- In depth: Goeldi, A. (2007), *The Emerging Market for Web-based Enterprise Software*, Master's Thesis, MIT.

#### *Readings for Session 9*

- Shuen, A. (2008), New Recombines with Old, Chapter 5, 129-155.
- Iyer, B., & Davenport, T.H. (2008), Reverse Engineering Google's Innovation Machine, *Harvard Business Review*, 86(4), 58-69.
- Hagel, J., Brown, J. S., & Davison, L. (2008), Shaping strategy in a world of constant disruption, *Harvard Business Review*, October, 81-89.
- Weiss, M., and Gangadharan, G.R. (2010), Modeling the Mashup Ecosystem: Structure and Growth, *R&D Management*, 40(1), 40-49.

### Readings for Session 10

- Heer, J., & Agrawala, M. (2008), Design considerations for collaborative visual analytics, *Information Visualization*, 7, 49-62.
- Pirolli, P. (2009), An elementary social information foraging model, *Conference on Human Factors in Computing Systems*, ACM, 605-614.
- Huynh, D., Karger, D., & Miller, R. (2007), Exhibit: lightweight structured data publishing, *International World Wide Web Conference (WWW)*, ACM, 737-746.
- Huynh, D., Mazzochi, S., & Karger, D. (2007), Piggy Bank: experience the semantic web inside your web browser, *Web Semantics: Science, Services and Agents on the World Wide Web*, 5(1), 16-27.
- In depth: Huynh, D. (2007), *User Interfaces Supporting Casual Data-Centric Interactions on the Web*, Master's Thesis, MIT.

### Readings for Session 11

- Yee, R. (2008), Making your web site mashable, Chapter 12, 313-324.
- Fielding, R., & Taylor, R. (2002), Principled design of modern web architecture, *ACM Transactions on Internet Technology*, 2(2), 115-150.
- Gamble, M. T., & Gamble, R. (2008), Monoliths to mashups, *IEEE Software*, November/December, 71-79.
- Vermeulen, J., Luyten, K., & Coninx, K. (2007), Tangible mashups: exploiting links between the physical and virtual world, *International Workshop on System Support for the Internet of Things (WoSSIoT)*, 1-5.

### Readings for Session 12

- Karaganis, J., The ecology of control: filters, digital rights management, and trusted computing, Chapter 16, in: Karaganis, J. (ed.), *Structure of Participation in Digital Culture*, Social Science Research Council, New York, 256-280, <http://www.ssrc.org/blogs/books/wp-content/uploads/2008/02/spdc-complete.pdf>.
- Bollier, D. (2008), Creators Take Charge, Chapter 6.
- Gangadharan, G. R., D'Andrea, V., Weiss, M., & Ianella, R. (2008), Service license composition and compatibility analysis, *International Journal of Cooperative Information Systems*, 17(3), 301-317.

### Reference texts

All reference texts for this class are either available online or through the e-books section of the library.

- Bollier, D. (2008), *Viral Spiral*, The New Press, available at under a Creative Commons license at: <http://www.viralspiral.cc/sites/default/files/ViralSpiral.pdf>
- Governor, J., Hinchcliffe, D., & Nickull, D. (2009), *Web 2.0 Architectures*, O'Reilly.
- Leadbeater, C. (2009), *We-Think: Mass Innovation, Not Mass Production*, Updated Edition, Profile Books, chapters 1-3 available at: <http://www.wethinkthebook.net>.
- Mahemoff, M. (2006), *Ajax Design Patterns*, O'Reilly.
- Musser, J., & O'Reilly (2006), *Web 2.0: Principles and Best Practices*, O'Reilly Radar.
- Ogrinz, M. (2009), *Mashup Patterns: Designs and Examples for the Modern Enterprise*, Pearson.
- Shuen, A. (2008), *Web 2.0: A Strategy Guide*, O'Reilly, available on Safari through the library.
- Yee, R. (2008), *Pro Web 2.0 Mashups: Remixing Data and Web Services*, Apress, Springer, available through the Lecture Notes in Computer Science (LNCS) link from the library.

### Suggested books

- Abelson, H., Ledee, K., & Lewis, H. (2008), *Blown to Bits*, Addison Wesley.

- Allamarjum, S., & Amundsen, M. (2009), *RESTful Web Services Cookbook*, O'Reilly.
- Bell, G. (2009), *Social Web Applications*, O'Reilly.
- Hayes, T. (2008), *Jump Point: How Network Culture is Revolutionizing Business*, McGraw Hill.
- Lessig, L. (2008), *Remix: Making Art and Commerce Thrive in the Hybrid Economy*, Penguin.
- Li, C., & Bernoff, J. (2008), *Groundswell: Winning in a World Transformed by Social Technologies*, Harvard Business Press.
- Libert, B., & Spector, J. (2008), *We are Smarter than Me*, Wharton School Publishing.
- Lytras, M., Damiani, E., de Pablos, P. (2009), *Web 2.0: The Business Model*, Springer.
- McAfee, A. (2009), *Enterprise 2.0: New Collaborative Tools for Your Organization's Toughest Challenges*, Harvard Business Press.
- Penenberg, A. (2009), *Viral Loop: From Facebook to Twitter, How Today's Smartest Businesses Grow Themselves*, Hyperion.
- Segram, T. (2007), *Programming Collective Intelligence*, O'Reilly.
- Shih, C. (2009), *The Facebook Era: Tapping Online Social Networks to Build Better Products and Sell More Stuff*, Prentice Hall.
- Shirky, C. (2008), *Here Comes Everybody: The Power of Organizing without Organizations*, Penguin.
- Zittrain, J. (2008), *The Future of the Internet*, Yale University Press, also available under a Creative Commons License at <http://futureoftheinternet.org/download>