



# HINF 552 Evaluation in eHealth

## Course Outline

### May 17-29, 2010 Workshop

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<b>Course Name:</b>	Evaluation in eHealth	This course requires human subject
<b>Sections/CRN:</b>	On-campus A01-31228; Online A02-31229	research approval: <b>No</b>
<b>Class Time:</b>	May 18, 19, 21-24 and 26	This course has a mandatory lab
<b>Class Location:</b>	TBA	component: <b>No</b>
<b>Instructor:</b>	Dr. Francis Lau	<b>Phone:</b> 1-250-472-5131
<b>Office / Hours:</b>	HSD A218; by phone and email	<b>Email:</b> <a href="mailto:fylau@uvic.ca">fylau@uvic.ca</a>

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### **DESCRIPTION**

This course is a study of evaluation approaches used to examine the design, deployment, use and impacts of eHealth applications in healthcare organizations. For this course, eHealth is broadly defined to cover a wide range of electronic health information systems and services that are supported by various types of information and communication technologies. Examples of eHealth applications are computerized provider order entry systems, electronic health records, telehealth remote monitoring, and disease surveillance systems.

The evaluation approaches in this course cover evaluation frameworks, methods and studies that span the entire eHealth adoption lifecycle from design thru use to impacts. Evaluation frameworks provide the common mental models to make sense of eHealth. Evaluation methods provide the means to design and conduct studies that examine the effects of eHealth. Studies provide published eHealth evaluation examples.

### **COURSE GOAL**

This course is intended to help students learn about the types of eHealth evaluation frameworks, methods and studies available; how evaluation studies are designed, conducted and reported; and the use of evaluation findings to inform healthcare policy and practice.

### **MAJOR OBJECTIVES**

Upon completion of this course, students should be able to:

- Describe selected eHealth evaluation frameworks, methods and studies published in literature;
- Recognize the importance and use of formative evaluation to improve the eHealth adoption lifecycle;
- Apply specific eHealth frameworks and methods to design field evaluation studies;
- Appraise the quality of published eHealth evaluation studies.

### **COURSE DELIVERY**

This course is delivered as an intensive 2-week workshop with class lectures, group discussions, guest speakers and team/individual assignments. Students are expected to have completed all of the required readings PRIOR to attending the workshop. The final assignment is due 2 weeks afterward.

## COURSE WORK

- **Class Schedule and Materials** – See pages 3-4 for session details and schedule at a glance for week1 and week2. For course reading materials please contact the instructor via email PRIOR to the workshop.
- **Assignment1 - Developing an Evaluation Plan.** This is a team assignment where groups of 3-4 students are to select an eHealth application of their choice and use the Cusack HIT evaluation toolkit [7] to come up with an initial evaluation plan. The teams are to present and defend their plans in class then submit the powerpoint presentations for grading. This assignment is due May 24 in class for 20%.
- **Assignment2 - Appraising Evaluation Studies.** This is an individual assignment where each student is to apply the quality assessment (QA) criteria from Garg [11] and Ammenwerth [20] to appraise the four case studies discussed in class [22-25]. The output should include the student’s assessment scores for the four studies with justifications of the scores chosen, and a comparison of the two QA methods in terms of their overall usefulness in appraising field evaluation studies. This assignment is due Jun 2 midnight for 20%.
- **Assignment3 – Designing an Evaluation Study.** This is an individual assignment where each student is to apply relevant concepts from the course to design an evaluation study for an eHealth application of his/her choice. The output should include a literature review based on 3-5 published studies on the eHealth application chosen, and an evaluation plan to describe the purpose, methods and expected results of the evaluation of the application. The output should be 5-page, single-space, font size 12, with 1-inch margins excluding tables, figures, references and appendices. This assignment is due Jun 13 midnight for 60%.

## GRADES AND GRADING SCHEME

Assignment1 Developing An Evaluation Plan – Due on May 24 in class	20%
Assignment2 Appraising Evaluation Studies – Due Jun 2 midnight	20%
Assignment3 Designing An Evaluation Study – Due Jun 13 midnight	60%

IF GRADES ARE POSTED, THEY WILL BE POSTED WITH THE FULL STUDENT NUMBER, IN NUMERICAL ORDER. STUDENT NAMES WILL BE STRIPPED FROM THE LIST. ANY STUDENT NOT WISHING TO HAVE THEIR MARKS POSTED MUST NOTIFY THE INSTRUCTOR IN WRITING PRIOR TO THE FIRST EXAM.

Numerical Marks	Letter Grade	GPA
90 - 100	A+	9
85 - 89	A	8
80 - 84	A-	7
75 - 79	B+	6
70 - 74	B	5
65 - 69	B-	4
60 - 64	C+	3
55 - 59	C	2
50 - 54	D	1

## **CLASS SCHEDULE**

### **(a) Session Detail for Week 1 and Week2**

<b>Week of</b>	<b>Topic</b>	<b>Readings/Tasks</b>
May 18 8:30am	Introduction – Outline, Readings, Course Work, Interactions eHealth Evaluation Frameworks Part-1	Refs 1-2
May 18 10:30am	eHealth Evaluation Frameworks Part-2	Refs 3-4
May 18 1:30pm	eHealth Evaluation Frameworks - Examples	Refs 5-6
May 18 3:30pm	Teamwork Assignment1 – Developing an Evaluation Plan	Assignment1 ; Ref 7 Due May 24 Monday in class
May 19 8:30am	eHealth Evaluation Methods	Refs 8-9
May 19 10:30am	eHealth Evaluation Examples: Systematic Reviews Part-1	Refs 10-11
May 19 1:30pm	eHealth Evaluation Examples: Systematic Reviews Part-2	Refs 12-13
May 19 3:30pm	Assignment1 – Developing an Evaluation Plan Mary Lesperance on Sample Size	Assignment1 continue Due May 24 Monday in class
May 21 8:30am	Rapid Evaluation Approaches - Morgan Price as co-presenter	Refs 14-15
May 21 10:30am	Rapid Evaluation Case Study – Morgan Price	Ref 16
May 22 1:30pm	Designing Evaluation Studies	Refs 17-19
May 22 3:30pm	Reporting Evaluation Studies Assignment2 - Appraising Evaluation Studies	Refs 20-21 Assignment2 - Due Jun 2 midnight
May 23 8:30am	eHealth Evaluation Case Studies Part-1	Refs 22-23
May 23 10:30am	eHealth Evaluation Case Studies Part-2	Refs 24-25
May 24 All day	Team Presentations for Assignment1	Assignment1 Team presentations in class
May 26 8:30am	Guest Speakers – Life in the Trenches with eHealth Evaluation Morgan Price, Myrna Francis Malcolm Maclure	
May 26 10:30am	Roundtable Session – Issues/Challenges in eHealth Evaluation Morgan Price, Myrna Francis, Malcolm Maclure	
May 26 1:30pm	eHealth Evaluation – Summary and Reflections Assignment3 – Designing an Evaluation Study	Assignment3 Due Jun 13 by midnight

**(b) Class Schedule at a Glance – Week 1**

Date/Time	Monday May 17	Tuesday May 18	Wednesday May 19	Thursday May 20	Friday May 21	Saturday May 22	Sunday May 23
8:30-10:15am	Orientation	HINF552 eHealth Evaluation Frameworks Refs 1-2	HINF552 eHealth Evaluation Methods Refs 8-9	HINF551	HINF552 Rapid Evaluation Approaches Refs 14-15	HINF551	HINF552 eHealth Evaluation Case Studies Refs 22-23
10:15-10:30am	Break	Break	Break	Break	Break	Break	Break
10:30-12:30pm	Orientation	HINF552 eHealth Evaluation Frameworks Refs 3-4	HINF552 Examples: Systematic Reviews Refs 10-11	HINF551	HINF552 Rapid Evaluation Case Study Ref 16	HINF551	HINF552 eHealth Evaluation Case Studies Refs 24-25
12:30-1:30pm	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:30-3:15pm	HINF551	HINF552 Evaluation Framework Examples Refs 5-6	HINF552 Examples: Systematic Reviews Refs 12-13	HINF551	Library Literature Search Session	HINF552 Designing Evaluation Studies Refs 17-19	
3:15-3:30pm	Break	Break	Break	Break		Break	
3:30-4:30pm	HINF551	HINF552 Teamwork Assignment1 Ref 7	HINF552 Assignment1 Guest Speaker Sample Size	HINF551		HINF552 Reporting Evaluation Studies Assignment2 Refs 20-21	

**(c) Class Schedule at a Glance – Week 2**

Date/Time	Monday May 24	Tuesday May 25	Wednesday May 26	Thursday May 27	Friday May 28	Saturday May 29
8:30-10:15am	HINF552 Team Presentations	HINF551	HINF552 Guest Speakers	HINF551		HINF551
10:15-10:30am	Break	Break	Break	Break	Break	Break
10:30-12:30pm	HINF552 Team Presentations	HINF551	HINF552 Evaluation Roundtable	HINF551		HINF551
12:30-1:30pm	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
1:30-3:15pm	HINF552 Team Presentations	HINF551	HINF552 Summary Assignment3		HINF551	HINF551
3:15-3:30pm	Break	Break	Break		Break	Break
3:30-4:30pm	HINF552 Team Presentations	HINF551			HINF551	HINF551
5:30pm-Later					Closing Reception 4-7pm	

## **REFERENCES**

### **Required Readings**

1. Ammenwerth E, Keizer N de. An inventory of evaluation studies of information technology in health care: Trends in evaluation research 1982-2002. *Methods Inf Med* 2005; 44:44-56.
2. Kaplan B, Shaw NT. Future directions in evaluation research: People, organizational and social issues. *Methods Inf Med* 2004; 43:215-31.
3. Bakken S, Ruland CM. Translating clinical informatics interventions into routine clinical care: How can the RE-AIM framework help? *J Am Med Inform Assoc*. 2009;16:889-98.
4. van der Meijden MJ, Tange HJ, Hasman JTA. Determinants of success of inpatient clinical information systems: A literature review. *J Am Med Inform Assoc*. 2003;10:235-43.
5. Dorr D, Bonner LM, Cohen AN, Shoai RS, Perrin R, Chaney E, Young AS. Informatics systems to promote improved care for chronic illnesses: A literature review. *J Am Med Inform Assoc*. 2007;14:1569-63.
6. Lau F, Charlebois M, Wong A, Keshavjee K. *Clinical Adoption: Extending the Infoway Benefits Evaluation Framework*. Nov 17, 2009. Draft only – unpublished.
7. Cusack CM, Byrne CM, Hook JM, McGowan J, Poon E, Zafar A. *Health Information Technology Evaluation Toolkit 2009 Update*. AHRQ Publication No. 09-0083-EF, June 2009. URL: <http://healthit.ahrq.gov> (then click Health IT Tools link on left column for the publication); accessed March 30, 2010.
8. Shcherbatykh I, Holbrook A, Thabane L, Dolovich L. Methodologic issues in health informatics trials: The complexities of complex interventions. *J Am Med Inform Assoc*. 2008;15:575-80.
9. Harris AD, McGregor JC, Perencevich EN, Furuno JP, Zhu J, Peterson DE, Finkelstein J. The use and interpretation of quasi-experimental studies in medical informatics. *J Am Med Inform Assoc* 2006;13:16-23.
10. Ammenwerth E, Schnell-Inderst P, Machan C, Siebert U. The Effect of Electronic Prescribing on Medication Errors and Adverse Drug Events: A Systematic Review. *J Am Med Inform Assoc* 2008;15:585–600.
11. Garg AX, Adhikari NK, McDonald H, et al. Effects of computerized clinical decision support systems on practitioner performance and patient outcomes: a systematic review. *JAMA* 2005;293(10):1223-38.
12. Poissant L, Pereira J, Tamblyn R, Kawasumi Y. The impact of electronic health records on time efficiency of physicians and nurses: systematic review. *J Am Med Inform Assoc* 2005; 12: 505-16.
13. Gurses AP, Xiao Y. A systematic review of the literature on multidisciplinary rounds to design information technology. *J Am Med Inform Assoc* 2006;13:267-76.
14. Uvic eHealth Observatory Rapid Response Evaluation Methodology- *Resources Tools* section. URL: <http://ehealth.uvic.ca/resources/tools/tools.php> ; last accessed March 30, 2010.
15. Uvic eHealth Observatory Rapid Response Evaluation Methodology- *Resources Study Planning* section. URL: <http://ehealth.uvic.ca/resources/studyPlanning/StudyPlanning.php> ; last accessed March 30, 2010.
16. Uvic eHealth Observatory: *A Proposed Formative Evaluation Study to Examine the Effects of Deploying a Physician Office EMR System on Patient Care*. Draft version 1.0, March 30, 2010.
17. Centre for Reviews and Dissemination. *Systematic reviews: CRD's guidance for undertaking reviews in health care [Internet]*. York: University of York; 2009. Section 1.3.4 on quality assessment. Accessed March 31, 2010. URL: [http://www.york.ac.uk/inst/crd/systematic\\_reviews\\_book.htm](http://www.york.ac.uk/inst/crd/systematic_reviews_book.htm)
18. Poon EG, Cusack CM, McGowan JJ. Evaluating healthcare information technology outside of academia: Observations from the National Resource Center for Healthcare Information Technology at the Agency for Healthcare Research and Quality. *J Am Med Inform Assoc* 2009;16:631-6.
19. McGowan JJ, Cusack CM, Poon EG. Formative evaluation: A critical component in EHR implementation. *J Am Med Inform Assoc* 2008;15:297-305.
20. Ammenwerth E, Wolff AC, Knaup P, Ulmer H, et al. Developing and evaluating criteria to help reviewers of biomedical informatics manuscripts. *J Am Med Inform Assoc* 2003;10:512-4. Also download revised criteria at <http://www.imiapubs.org/pdf/qualitycriteria.pdf> ; accessed March 30, 2010.

21. Talmon J, Ammenwerth E, Brender J, de Keizer N, Nykanen P, Rigby M. STARE-HI – Statement on Reporting of Evaluation Studies in Health Informatics. *IMIA Yearbook Med Inform* 2009; 23-31.
22. Shea S, Weinstock RS, Teresi JA, et al. A randomized trial comparing telemedicine case management with usual care in older, ethnically diverse, medically underserved patients with diabetes mellitus: 5 year results of the IDEATel study. *J Am Med Inform Assoc* 2009;16:446-56.
23. Unertl KM, Weinger MB, Johnson KB, Lorenzi NM. Describing and modeling workflow and information flow in chronic disease care. *J Am Med Inform Assoc* 2009;16:826-36.
24. Wang CJ, Patel MH, Schueth AJ, et al. Perceptions of standards-based electronic prescribing systems as implemented in outpatient primary care: A physician survey. *J Am Med Inform Assoc* 2009;16:493-502.
25. Jha AK, Laguette J, Seger A, et al. Can surveillance system identify and avert adverse drug events? A prospective evaluation of a commercial application. *J Am Med Inform Assoc* 2008;15:647-53.

### Additional Resources

1. Agency for Healthcare Research and Quality. *Health IT*. URL: <http://healthit.ahrq.gov/> ; Apr 2, 2010.
2. Ammenwerth E, de Keizer N. *Evaluation Database: A web-based inventory of evaluation studies in medical informatics (1982-2002)*. URL: <http://evaldb.umit.at/> ; accessed Apr 2, 2010.
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10. Lau F, Hagens S, Muttitt S. A proposed benefits evaluation framework for health information systems in Canada. *Healthcare Quarterly* 2007;10(1):112-8.
11. Lau F, et al. *UVic eHealth Observatory*. URL: <http://ehealth.uvic.ca/> ; accessed Apr 2, 2010.
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13. Office of National Coordinator USA. *Health IT*. URL: <http://healthit.hhs.gov> ; accessed Apr 2, 2010.
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