



The University of North Carolina at Chapel Hill School of Nursing



NURS 879: User-Centered Analysis and Design of Health Care Information Systems and Interfaces

Fall 2018

Saif Khairat, PhD

NOTE: The Course Coordinator reserves the right to alter or change any statement contained herein, without prior notice, if his/her professional judgment deems it necessary. This syllabus may not be reproduced without the permission the Course Coordinator and the Program Director.

Fall 2018

Office Hours. Flexible; please call or email for appointment

Course Credits. 3 credit hours (2 credits didactic, 60 hours clinical credit)

Prerequisites. Admission to a health informatics graduate program. N730, N870 or permission of instructor.

Co-requisites: None

Day, Time, Location. This class is scheduled to meet Bi-weekly, along with 60 hours of clinical. This is a hybrid course, some of the class sessions will be online, as outlined in the course schedule. For all face-to-face sessions (F2F), we will meet on **Tuesday, 3 hours, Carrington 304.**

Time: **5:15-8:15pm:**

In-Class meetings: **8/21; 9/11; 9/25; 10/9; 10/23; 11/6; 11/20**

Course Faculty.

Professor: Saif Khairat, PhD; saif@unc.edu; 919-843-5413

Teaching Assistant: Terika McCall, MPH, MBA; tmccall@unc.edu

Course Description.

This course combines user-centered design theories, the science of systems analysis and design, and usability in health care, supported by real-world exercises in a simulated environment.

Course Objectives. Upon completion of the course, students will be able to:

1. Describe core user-centered information systems analysis principles, and information system and interface design principles.
2. Define usability testing and usability research and how usability contributes to the design of health care technology.
3. Critique the advantages and disadvantages of different user interfaces.
4. Articulate an appropriate method for evaluating health care information systems and user interfaces.
5. Apply information systems analysis and design tools and approaches.
6. Given a user audience, design and conduct a usability test based upon user audience requirements.
7. Synthesize usability test results through written and verbal reports.

Content Outline

1. Introduction to user-centered information systems analysis
2. Introduction to user-computer interaction science
3. User-centered systems analysis and design approaches
 - a. Design
 - i. Task analysis
 - ii. Focus groups
 - iii. Collaborations
 - b. Navigation
 - i. Information design
 - ii. Workflow
4. Introduction to health care usability testing
 - a. Heuristic evaluation
 - b. Cognitive walkthrough
 - c. Think-aloud protocol
 - d. Eye tracking
5. Preparation for Usability Test
6. Usability Test and Results

Required Text.

Inspired EHRs: Designing for Clinicians. By: Jeff Belden et al.

Available on:

http://inspiredehrs.org/Inspired_EHRs_Designing_for_Clinicians.pdf

Extra readings:

1. Selected chapters from: Langer, A. (2016). *Guide to software development: Designing and managing the Life Cycle*. New York: Springer.
2. Nielsen J, Mack RL. Usability Inspection Methods. ISBN 0-471-01877-5.
3. Norman DA. *The Design of Everyday Things*: Basic Books; 2002.
4. Hafner, Katie. "Wanted by the Police: A Good Interface" *New York Times*, Nov 11, 2004.
5. Gould, J.D. and Lewis, C., "Designing for usability: Key principles and what designers think," *Communications of the ACM*, 1985, 28, 300-311.
6. Rosenbaum, S. Usability Evaluations Versus Usability. Testing: When and Why?"

Assignments. Assignments will build on concepts of systems analysis to address user-centered design of health care information systems and interfaces. Students will develop skills to design, implement and test health care information systems and interfaces.

Examples of assignments:

1. Information gathering/needs analysis
2. Problem definition and systems design
3. EHR Documentation Evaluation (attached)
4. EHR Essential Skills and Usability (attached)
5. Quality Improvement Utilizing the EHR (attached)

Evaluation of Student Performance and Grading Scale

Students will be evaluated for course grades as follows:

Item	Maximum Points	% Grade
Course participation	30	15%
Individual journal paper reflection	30	15%
Individual Journal paper presentation	30	15%
Quiz	20	10%
Final Group Project		
Needs assessment paper	30	15%
Final Deliverable	40	20%
Oral presentation	20	10%
TOTAL	100	100%

The grading scale is:

Points	Grade
94-100	H
80-93	P
70-79	L
69 or below	F

Content Outline/Class Schedule/Modules and Required Reading and Assignments

The table below describes the topics covered in each class session or online module.

Module	Date <i>*in person class</i>	Topic <i>#Online discussion assignment starts this date (summary due 1 week later)</i>	Readings- on Sakai <i>(under Resources → Course Readings)</i> <i>Read/Due by Wednesday 4pm</i>
1	*Aug 21	Health Information systems and interface design principles	Electronic health Records implementation: An evaluation Of information System impact and contingency factors
2	Aug 28	Medication List & Medication Reconciliation	1. Inspired EHR: Chapters 2 &3: Medication List & Medication Reconciliation 2. <u>Online Discussion</u>
3	*Sep 4	User-centered information systems	1. Systematic Review Protocol to Assess the Effectiveness of Usability Questionnaires in mHealth App Studies 2. UCD Processes
4	Sept 11	Allergy List & E-Prescribing	1. Inspired EHR: Chapter 4&5: Allergy List & E-Prescribing 2. <u>Online Discussion</u>
5	*Sept 18	Information systems analysis	1. Usability of Two EHR 2. <u>Final project topic (team)</u>
6	*Sept 25	Information gathering/needs analysis	1. Enhancing Patient safety 2. Quiz
7	Oct 2	Drug Alerts	1. Inspired EHR: Chapter 6: Drug Alerts 2. <u>Online Discussion</u>
8	Oct 9	Human Factors	1. Inspired EHR: Chapter 7: Human Factors 2. <u>Online Discussion</u>
9	*Oct 16	Methods for evaluating health care information systems	1. EHR workload and performance 2. <u>Information/Needs assessment paper</u>
10	Oct 23	Design Principles	1. Inspired EHR: Chapter 8: Design Principles 2. <u>Online Discussion</u>
11	Oct 30	Health IT Usability	1. Inspired EHR: Chapter 9: Health IT Usability 2. <u>Online Discussion</u>
12	*Nov 6	Human-Computer Interaction Principles	1. Human Factors
13	*Nov 20	Usability testing	1. Usability Evaluation 2. <u>Final Project Deliverable</u>
14	*Nov 27	Group Presentations	1. TURF 2. <u>Final group presentations</u>

Submission of Assignments

Students will post the assignments on Sakai (one per group for group assignments). More detailed instructions are provided with each assignment.

Working in Teams

Students work in teams for two aspects of this course: 1) to participate in Discussion Boards assignments; and 2) to complete the final group project. For both of these class requirements, team members will work collaboratively to develop and conduct the class. Collaboration means that everyone takes part in deciding how to organize and carry out the assignment, and in allocating the work to complete the assignment.

Discussion board teams will be assigned at the beginning of the course and students will work with the same team for the entire semester. **Teams may find it useful to designate individuals to fill the following specific roles for the weekly group assignments:**

- a) A leader to coordinate communications and workflow;
- b) A record-keeper to maintain documentation; and
- c) A coordinator to facilitate the development of final products.
- d) A poster or summarizer for the assignment summary (rotating)

Team members should NOT assume that the leader is solely responsible for completing assignments. The work of all assignments should be *shared equally* among all team members, and the leader may rotate, depending on the needs of the group and the assignment. Leadership is only one component of the team's work. Team members are encouraged to consider their common interests, backgrounds and personal styles as they allocate the work necessary to carry out the project.

Ground Rules for Working in Teams: As in our everyday life and work, it is expected that team members will establish ground rules to accomplish the work of the team. At a *minimum* it is expected that team members will:

- a) Show respect for all members.
- b) Contribute to and reach consensus on goals and methods.
- c) Share in the workload, as agreed upon by team members.
- d) Follow the timeframe established by the team.
- e) Stay in touch and report on progress.
- f) Keep an open mind to views that are different.

Guidelines for Written Assignments

Papers submitted for class assignments should include references to the published scientific literature and online (Internet) resources. Students should format the references according to the American Psychological Association (APA) guidelines. The manual is recommended for all graduate students:

American Psychological Association. (2009). *Publication Manual of the American Psychological Association (6th Ed.)*. Washington, DC: Author. <http://www.apastyle.org/>

Online information about APA citations are available in 2 places.

1. Document with examples provided on course Sakai site, under Course Resources
2. Tutorial developed for the School of Nursing, can be found at <http://www.hsl.unc.edu/services/tutorials/apastyle/index.cfm>

HONOR CODE. The Honor Code and the Campus Code (<http://honor.unc.edu>), embodying the ideals of academic honesty, integrity, and responsible citizenship, have for over 100 years governed the performance of all academic work and student conduct at the University. Acceptance by a student of enrollment in the University presupposes a commitment to the principles embodied in these codes and a respect for this most significant University tradition. Your participation in this course comes with the expectation that your work will be completed in full observance of the Honor Code. Academic dishonesty in any form is unacceptable, because any breach in academic integrity, however small, strikes destructively at the University's life and work. If you have any questions about your responsibility or the responsibility of faculty members under the Honor Code, please consult with someone in either the Office of the Student Attorney General (telephone: 919-966-4084) or the Office of the Dean of Students (telephone: 919-966-4042). For additional information about the honor code, please also refer to the University website. The Information for Students and Plagiarism sections are especially helpful.

Any student who submits the identical or nearly identical assignment (paper, project or other assignment) to 2 or more courses will be considered as having violated the Honor Code. It is crucial to remember that you must also give credit for ideas that are not your own, whether or not those ideas have been written down somewhere. If your classmate comes up with a brilliant example and you use it in your paper, then you must cite him or her accordingly. Each student should know the Honor Code and take it seriously.

DISABILITY SERVICES.

If you have a disability (<http://nursing.unc.edu/current/handbook/disability.html>) that requires an accommodation in this class, you need to communicate those needs to the Department of Disability Services (<http://disabilityservices.unc.edu>) (962-8300) or Learning Disability Services (962-7227) (<http://www.unc.edu/depts/lds>).

ACADEMIC POLICIES. The Academic Policies are designed to be minimal standards for the rights and responsibilities of students and faculty. Students are encouraged to review these policies on a continuing basis throughout their program of study as found in the School of Nursing Student Handbook (<http://nursing.unc.edu/current/handbook/index.html>).

ACADEMIC DIFFICULTIES. Each student is expected and encouraged to please see me if you are having academic difficulties related to this course. Please do not struggle alone---I am here to help!

RELIGIOUS OBSERVANCES. The School of Nursing recognizes and respects that many religions have days of the year and celebrations they honor. In order to assure reasonable accommodations and appropriate alternative assignments, when a student in a non-clinical course needs to miss classes, exams, and/or written assignments due to the observance of a religious holiday, he/she must notify the course coordinator in writing about the conflict at least three weeks before the beginning of the religious observance. To view the entire School of Nursing policy regarding religious holiday observances go to: http://nursing.unc.edu/current/handbook/ug_attendance.html