SI 554 / HBHE 654: Consumer Health Informatics
Winter 2020
Mondays, 5:30-8:30 pm
CHEM A859

Instructor
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12:00 noon – 1:30 p.m.
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Course Overview
Consumer health informatics (CHI) is a rapidly expanding area of informatics practice, with career opportunities emerging in the public, non-profit and private sectors. Broadly, the field aims to give individual health care consumers, as well as their families and communities, the information and tools that they need to help them become more involved in their health and health care. In this course, students will become familiar with a range of CHI applications, including the needs/problems that the applications address, their theoretical bases, their design, and relevant evaluation results.

The course will cover an overview of health behavior theories that are relevant to health behavior change and health information behavior and explore how they might be applied to promote changes in health behavior and/or explain health consumers’ behaviors. The course will also introduce key issues such as health literacy, patient-centered communication, patient empowerment, patient-generated data, participation, and privacy. Students will acquire an ability to evaluate existing applications, and to generate theory-informed design and implementation strategies for CHI applications. Students will also learn to assess the needs and technological practices of potential users, with a particular focus on groups that experience health and information access disparities.

Learning Objectives
By the end of the class, students should be able to:
1. Explain what consumer health informatics is, and describe how theory can be used to facilitate changes in health behavior and/or promote health.
2. Compare and evaluate a range of consumer health informatics (CHI) applications
3. Assess consumers’ health-related needs, resources and technology-oriented practices, and evaluate their implications for CHI applications.
4. Develop guidelines and recommendations for addressing identified needs using consumer technologies.
5. Develop a commitment to CHI practice with diverse user groups.

HBHE Competencies
This course provides training towards the following HBHE competencies:
1. Understand the merits of using theory to inform interventions and their evaluation in public health.
2. Apply evidence-based approaches to the development and evaluation of public health programs.
3. Design, implement, and evaluate culturally appropriate interventions for diverse individuals and communities.

Course Resources
There are assigned readings drawn from a range of sources. Course readings and other resources are delivered via the University of Michigan Canvas course management system (or the World Wide Web). The Files folder in Canvas contains copies of the weekly course readings, located in subfolders labelled by week number.
Separate Canvas folders include tools for submitting assignments and other facilities. The most current copy of this document, the Course Syllabus, also resides on the Canvas site.
All course materials are provided in electronic form under the "fair use" copyright exemption. This means that you may not redistribute copies of class readings outside the class. For more information, see "Copyright at the University of Michigan: For Students."

OVERVIEW OF ASSIGNMENTS

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Class #</th>
<th>Date</th>
<th>Value (% of final grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI application critique (Individual Assignment)</td>
<td>Class 5</td>
<td>Feb 17</td>
<td>20%</td>
</tr>
<tr>
<td>Designing for Diversity Project (Group Assignment)</td>
<td>Class 8</td>
<td>March 16</td>
<td>20%</td>
</tr>
<tr>
<td>Needs assessment and gap analysis (Group Assignment – part 1)</td>
<td>Class 11</td>
<td>April 6</td>
<td>25%</td>
</tr>
<tr>
<td>Lightning Talk re: a new CHI intervention/application (Group Assignment – part 2a)</td>
<td>Classes 12 &amp; 13</td>
<td>April 13</td>
<td>5%</td>
</tr>
<tr>
<td>Proposal for a new CHI intervention/application (Group Assignment – part 2b)</td>
<td>Class 13</td>
<td>April 20</td>
<td>20%</td>
</tr>
</tbody>
</table>

There is an additional 10% of your grade that is calculated based on class attendance, participation and the leading of assigned case discussion segments.

Assignment Format

Assignments should be written in a 12-point font on letter-sized paper with one-inch margins. All papers should be double-spaced – with the exception of the “Design Principles” document developed for the Designing for Diversity assignment – you can use the fonts and spacing that you wish for that assignment. If citations are included, please use American Psychological Association (APA) style guidelines for citing materials used in your assignments. The style guide can be found online at: [http://owl.english.purdue.edu/owl/resource/560/01/](http://owl.english.purdue.edu/owl/resource/560/01/).

Please submit your assignments in **Microsoft Word** format. Please name your Word file beginning with your surname. For group assignments, please use surname(s) in alphabetical order, followed by the assignment title (e.g., Williams_CHI_Application_Critique.docx).
Late assignments
Assignments that are submitted late will lose 2/3 of a letter grade on the first day that an assignment is late. After that, 1/3 of a letter grade will be deducted for each day the assignment is late, up to two whole letter grades. Students may request an extension, but they must contact me 24 hours in advance and give a valid reason why they are late.

Grade reconsideration
I make every effort to apply grading criteria objectively and fairly. However, if you believe the grade you received on an assignment is inappropriate, you may ask to have your grade reconsidered. To do so, you must explain in an email to your instructor why you feel your work deserves re-grading. You should provide details and point to specifics in the assignment that you feel merit a higher grade. Requesting a grade reconsideration does not ensure that your grade will change, but your arguments will be carefully considered. Note: one of three outcomes is possible: your grade may be raised, it may remain the same, or it may be lowered.

GRADING
Drawing from the Master’s Student Handbook, all assignments will be graded as follows:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Points</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>98-100</td>
<td>Extraordinary achievement. Rarely given.</td>
</tr>
<tr>
<td>A</td>
<td>94-97</td>
<td>Outstanding performance in all course aspects such qualities as analytical ability, creativity, and originality are exhibited at a very high level.</td>
</tr>
<tr>
<td>A-</td>
<td>90-93</td>
<td>Consistently good performance in most course aspects</td>
</tr>
<tr>
<td>B+</td>
<td>86-89</td>
<td>Strong, solid achievement in most aspects of the work.</td>
</tr>
<tr>
<td>B</td>
<td>83-85</td>
<td>Good performance. Consistent with performance expected of students in a graduate degree program.</td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
<td>Acceptable.</td>
</tr>
<tr>
<td>C+</td>
<td>76-79</td>
<td>Borderline.</td>
</tr>
<tr>
<td>C</td>
<td>73-75</td>
<td>Poor performance. This is a marginal grade which alerts students to their limited performance in a particular course.</td>
</tr>
<tr>
<td>C-</td>
<td>70-72</td>
<td>Very poor performance.</td>
</tr>
<tr>
<td>D</td>
<td>69 and below</td>
<td>Minimal. Performance not at a graduate student level. Student should review his/her progress in the program with the associate dean for academic affairs.</td>
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</tbody>
</table>

Attendance and participation
Given the case discussion heavy nature of the course, every student is required to attend class. Because life has eventualities, you are allowed one unexcused absence, and one excused absence. Any absence outside of these two allowances will result in 1% point being deducted for each instance from your participation grade.

COURSE POLICIES

Academic Integrity

Unless otherwise specified in an assignment all submitted work must be your own, original work. Any excerpts, statements, or phrases from the work of others must be clearly identified as a quotation, and a proper citation provided. Any violation of the School’s policy on Academic and Professional Integrity (stated in the Master’s and Doctoral Student Handbooks) will result in serious penalties, which might range from failing an assignment, to failing the course,
to being expelled from the program. Violations of academic and professional integrity will be reported to UMSI Student Affairs. Consequences impacting assignment or course grades are determined by the faculty instructor; additional sanctions may be imposed by the Assistant Dean for Academic and Student Affairs.

**Accommodations for Students with Disabilities**
If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities (SSD) to help us determine appropriate accommodations. SSD (734-763-3000; ssd.umich.edu/) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information that you provide in as confidential a manner as possible.

**Student Mental Health and Wellbeing**
The University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and https://caps.umich.edu/ during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (734) 764-8320 and https://www.uhs.umich.edu/mentalhealthsvcs, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources. For a listing of other mental health resources available on and off campus, visit: http://umich.edu/~mhealth/

**Attendance**
You are expected to attend all classes and participate as well as present during discussion segments. You are allowed one unexcused and one excused absence. All other absences outside of these two allowances will result in 1% deducted from your participation grade for each occurring non-attendance.

**Definition of Consumer Health Informatics used in this course**
This course uses the, “consumer health informatics” definition below. “Any electronic tool, technology or system that is:

1. primarily designed to interact with health information users or consumers (anyone who seeks or uses healthcare information for nonprofessional work),
2. interacts directly with the consumer who provides personal health information to the CHI system and receives personalized health information from the tool, application or system, and
3. is one in which the data, information, recommendations, or other benefits the consumer, may be used in coordination with a healthcare professional but is not dependent on a healthcare professional.” *(Gibbons et al, 2011)*

All technologies evaluated or proposed as a part of assignments in the course should conform to this definition.

**Acknowledgements.** Thank you to Johmarx Patton, MD, MHI for his assistance in preparing this syllabus.
Introduction and Background

January 13: What is Consumer Health Informatics and what impacts have CHI applications had, and for whom?

Readings


Optional


Case


Discussion questions

- What impacts have CHI applications had, and for whom?
- What impacts are missing? Who is missing?
- What needs are not met, and what can we do about it?

January 20

NO CLASS

MLK Day

Theories of Health Behavior Change

January 27

Part 1 - Theory of Planned Behavior/Integrated Behavior Model

Guest Speaker: Ezinne Ndukwe, MPH

Population Health Director, Michigan

Oak Street Health

Readings


**Introduction and Background**


**Cases**

**Get Active!**

- Imperative Health application [Slide deck]

**Computerized Simulation In promoting walking in individuals with diabetes**

  o To see the Simulation, see Multimedia Appendix 1 and Multimedia Appendix 2.

**Discussion questions**

- What TRA/TPB/IBM-related behavior change techniques are used in each of the two case study systems?
- Are any behavior change techniques shared between the two systems? Which behavior change techniques are not shared?
- How are any shared behavior change techniques implemented in each system?

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**Feb 3  Part 2 – Socio-cognitive theory**

**Readings**


**Cases**

*Watch, Discover, Think, and Act*

Introduction and Background

- Watch, Discover, Think, Act Screens [Slide deck]

Text2Quit

- Text2Quit application: http://www.text2quit.com

Discussion questions

- What SCT-related behavior change techniques are used in each of the two case study systems?
- Are any behavior change techniques shared between the two systems? Which behavior change techniques are not shared?
- How are any shared behavior change techniques implemented in each system?

Feb 10

Part 3 – Self-regulation and goal setting

Readings


Cases

“It’s LiFe!”


ManUp

- Video tour of ManUp Intervention: http://www.youtube.com/watch?v=m14DamHndI8
### Introduction and Background

Discussion questions

- What does the van der Weegen et al. case study, “It’s LiFe!” suggest about the ways in which user requirements for feedback can vary? Given this, what decisions do we need to make when designing feedback as an intervention component in a CHI application?
- What does the ManUp case study tell us about the design of goals for user engagement?

### Games for Health and self-monitoring

**Feb 17**

**ASSIGNMENT 1 DUE – CHI Application Critique**

| Guest Speaker – Rachel Richesson, MS, PhD, MPH, FACMI | Associate Professor, School of Nursing | Duke University School of Medicine |

**Readings**


**Cases**

3. MONARCA
   

**Discussion questions**

- How can one apply gamification principles to the design of consumer health informatics applications?
- How was this accomplished in the MoviPill and youth-focused social games case studies?
- For consumers and patients, what are the effects of self-monitoring?

### Designing for diverse populations

**Feb 24**

**Inclusive access**
Introduction and Background

Readings


Cases


Discussion questions

- Which population do you think would have similar design principles and in what way are they similar?
- What aspects of design of CHI applications vary depending on the audience?
- Compare mHealth and DIMA. In the DIMA case, what did the designers do to address the fact that their intended users had low literacy? How might those decisions have been different if literacy were not a concern?

<table>
<thead>
<tr>
<th>March 2</th>
<th>NO CLASS</th>
<th>Spring Break (Feb 29- March 8)</th>
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<tbody>
<tr>
<td>March 9</td>
<td>Usability</td>
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Readings


Discussion question
Introduction and Background

- What are personas, and how are they used in the design of technologies?

In-class activity

- Developing personas

March 16

ASSIGNMENT 2 DUE – Designing for Diversity

Group Class presentations

Questions to think about during presentations

- Which populations have similar design principles? Why are they similar?
- What aspects of design of CHI applications varied depending on the audience?

Awareness and Feedback

March 23

Personal Health records and consumer ethics, privacy and confidentiality

Guest Speaker – Jody Platt, PhD, MPH

Assistant Professor of Learning Health Sciences

Department of Learning Health Sciences, University of Michigan

School of Medicine

Readings


Cases

Microsoft HealthVault


Apple HealthKit and Health App
**Introduction and Background**


What can Apple’s HealthKit do? [You Tube video](https://www.youtube.com/watch?v=Q2PpQy5RFfE)

**Discussion questions**

- Evaluate Apple Health and HealthVault for comprehensiveness of coverage, connectivity to clinical systems, usability, ability to support patients’ self-management activities, and privacy/security.

**March 30**

**Remote monitoring**

**Readings**


**Cases**


**Discussion questions**

- What was being measured in the two case studies from this week’s readings?
- What was patient adherence and experience like, and why?
- What decision rules were used to identify a need for clinician action?
- When were alarms sent, to whom were they sent, and what messages were provided?

**Online social networks and community informatics**

**April 6**

**ASSIGNMENT 3 DUE – Needs Assessment and Gap Analysis**

<table>
<thead>
<tr>
<th>Guest Speaker- Joshua C. Rubin, JD, MBA, MPH, MPP</th>
<th>Executive Director</th>
<th>Joseph H. Kanter Family Foundation Learning Health System Initiatives, University of Michigan Medical School</th>
</tr>
</thead>
</table>

**Readings**
Introduction and Background


Cases

**PatientsLikeMe**


**Discussion questions**

- How might peer-to-peer communication between patients benefit them? What potentially negative effects might there be, if any?
- What does PatientsLikeMe do to encourage commitment amongst its members?
- What does PatientsLikeMe do to encourage contributions by its members?

**April 13 Lightning Talks (First round)**

**ASSIGNMENT DUE – Participation Self-Assessment**

**Readings**


**Cases**

**HealthWeaver**

Introduction and Background


Discussion questions

- What specific features did the creators of HealthWeaver include in their system so as to increase the amount of social support that cancer patients receive ("enacted support")? How might those features help to increase enacted social support?
- Do you think any of the features of the system might help to increase perceptions of available support? If so, what are they and how do they work?
- How can designers of social networking technologies make it easier for patients to understand what information they are sharing, and with whom?

### Consumer Health Informatics – The future

**April 20**

**Lightning Talks (Second round)**

**ASSIGNMENT 4 DUE – CHI Proposal**

Reading
