HLTH 434 - Introduction to Public Health Informatics

Semester: Fall 2017  
Section: 0101 and 0201  
Classroom: SPH 0308  
Time: Wednesdays 4:00-6:45 PM  
Instructor: Sandra Saperstein, PhD  
Email: ssaperst@umd.edu  
Office Hours: By appointment

Course Description: This course provides an overview of the field of public health informatics and how technology, information science, and web and mobile applications can support public health research and practice. Students will understand the technology competency needs of public health professionals and will have interactive experiences with available resources and tools. The course will familiarize students with informatics systems deployed at the national, state, and local levels, including non-traditional systems. Students will also be introduced to the field of consumer health informatics, including aspects related to the design, development, and evaluation of consumer health applications. The benefits and issues of using technology for health will be considered throughout the course.

Course Pre- and Co-requisites: Must have earned a minimum of 60 credits, no pre- or co-requisites

Course Learning Objectives:
Upon completing this course, the student will be able to:
1. Define public health informatics and consumer health informatics  
2. Compare and contrast the fields of public health informatics with other informatics fields  
3. Describe negative and positive outcomes associated with technology use  
4. Understand the informatics competencies for professional effectiveness  
5. Demonstrate use of technology for professional competency and efficiency  
6. Describe current and evolving US public health surveillance systems  
7. Use information technology to support scientific inquiry for public health by locating, accessing, using, and interpreting online health data and information  
8. Define EHR and explain how electronic health records can benefit public health  
9. Demonstrate data visualization strategies to improve communication of health information  
10. Describe how consumers use the Internet for health  
11. Discuss the digital divide and describe efforts to address inequities  
12. Assess the quality of online applications and websites used by consumers  
13. Demonstrate strategies for testing readability of documents  
14. Describe how health behavior theory has been used in online applications  
15. Describe how gamification has been applied to games for health  
16. Create a Powerpoint prototype for an app or game  
17. Describe the basic components of GIS and create a map using Google Fusion  
18. Explain the purposes and process of user-centered development and usability testing  
19. Demonstrate ability to conduct and document a usability test  
20. Demonstrate ability to create an online survey  
21. Understand ethics pertaining to online research and data sharing  
22. Describe the US health informatics infrastructure at the national, state, and local levels  
23. Describe the benefits and challenges of electronic health records and an interconnected healthcare  
24. Describe how standards, interoperability, & security affect the development of an interconnected system  
25. Explain Health 2.0 and its impact on health and research
Program Competencies Addressed in this Course:
The following competencies for the Public Health Science are addressed in this course:

1. Identify and define public health problems from ecological and interdisciplinary perspective.
2. Synthesize knowledge to formulate scientific solutions to public health problems.
3. Apply scientific knowledge to inform effective public health policy.

Required Texts and Other Readings: No textbook is required for this class. Current peer-reviewed journal articles and/or reports will be assigned for each topical area each week.

Required Technology and Other Materials: No technology is required. If you have a laptop, please bring it.

Course Communication: Canvas will be used for all communications. Announcements will be sent in the event of class cancellations, room changes, or other reminders as needed.

Course Requirements and Expectations:
This class will contain a mix of lecture, discussion, and in-class activities/assignments that will illustrate the informatics concepts covered. The in-class activities/assignments will be a mix of group and individual work. Each week, prior to class, you are expected to read the assigned article and post a comment or question about the article on the weekly discussion board prior to class. Attendance and participation are critical for you to successfully meet course objectives.

In accordance with university policy, if you are absent for a single lecture due to illness or some form of personal or family emergency, this absence will be considered “excused,” and I will accept a note from you, attesting to the date of the illness/incident, along with an acknowledgement that the information is true. Whenever feasible, you should contact me in advance. Multiple or prolonged absences, and absences that prevent attendance at a scheduled quiz or exam will require written documentation from an appropriate health care provider/organization. Make up exams will be given only when the student has a University-recognized absence. If a quiz or exam is to be missed for a legitimate reason the student must contact me (by email ONLY) PRIOR to the exam. If an exam is missed due to unforeseen circumstances on the day of the exam, the student must contact me within 24 hours of the missed exam. Official documentation of the excuse must be provided. If a student misses an exam for any unauthorized reason he/she will receive a grade of zero for that quiz or exam.

Major Graded Assignments: You will receive grades on two exams (mid-term and final), a final project, a group assignment involving development of an online survey, and participation in in-class activities and online discussion boards.

University Course Related Policies:
All University of Maryland-approved course policies are provided at the following website:

http://www.ugst.umd.edu/courserelatedpolicies.html

Policy descriptions, resources, and links to official policy documents are provided for:

Academic Integrity: What is cheating? What is plagiarism? What is the Honor Pledge?
Code of Student Conduct: What behavior is prohibited?
Sexual Misconduct: What to do in case of sexual harassment or sexual assault.
**Discrimination:** Procedures to prohibit discrimination, complaints about discrimination, harassment, and retaliation.

**Accessibility:** Information about disability support services (DSS) and accommodations.

**Attendance, Absences, or Missed Assignments:** The student must notify the instructor in a timely manner (typically first week of class). Read this prior to Schedule Adjustment date.

**Student Rights Regarding Undergraduate Courses:** What should I find in the course syllabus? Am I allowed to see my exams after they are graded?

**Official UMD Communication:** Use of email, communication with faculty, communication about cancelled class meetings, and weather-related or other urgent notifications.

**Mid-Term Grades:** Provided for 100 and 200 level courses, and all student athletes.

**Complaints About Course Final Grades:** Questions about course grades should first be addressed to the course instructor.

**Copyright and Intellectual Property:** Who owns the work that I produce in class?

**Final Exams:** Final exams are scheduled by the University.

**Course Evaluations:** The School of Public Health is committed to the use of student course evaluations for improving the student experience, course and curriculum delivery, and faculty instruction.

**Campus Resources:** ELMS, counseling, learning workshops, tutoring, writing help, questions about graduation, adding or dropping classes, withdrawing from the semester, etc.

**Course Procedures and Policies:**
All assignments are to be uploaded through Canvas. Late assignments are not accepted. Questions sent via email will be responded to within 24-48 hours of receipt during weekdays. Emails received after 5 on a Friday will be responded to on Monday.

**Inclement Weather / University Closings / Emergency Procedures:**
In the event that the University has a delayed opening or is closed for an emergency or extended period of time, the instructor will communicate to students regarding schedule adjustments, including rescheduling of examinations, lectures, and assignments due to inclement weather and campus emergencies.

**Available Support Services:**
- Office Hours – By appointment only
- Center for Academic Success – Services include academic coaching, writing consultations, and disability support to help you reach your academic goals
- Center for Counseling and Consultation – Provides free and confidential services for students
- Priddy Library - [https://shadygrove.umd.edu/library](https://shadygrove.umd.edu/library)
- Purdue Online Writing Lab – APA Formatting and Style Guide: [https://owl.english.purdue.edu/owl/resource/560/01/](https://owl.english.purdue.edu/owl/resource/560/01/)
- Public Health Informatics Institute – Non-profit organization that is focused on establishing informatics as an established public health discipline: [http://phii.org/](http://phii.org/)
- Journal of Medical Informatics Research - [https://www.jmir.org/](https://www.jmir.org/) - Prominent open-source journal. Also has sister journals including JMIR Public Health and Surveillance, JMIR mHealth and uHealth, and JMIR Serious Games.
Grading Procedures:

70 pts  **Individual or Group Project:** Each student will choose a project from a list of options provided by the Instructor. The final product will be different depending upon the selection, but the overall point distribution will be as follows:
- Due 9/20/17 – Topic choice – 5 points
- Due 11/1/17 – Progress report presentation – 15 points
- Due 12/6/17 – Final paper and project materials – 50 points

20 pts  **Assignment:** Due 11/29/17 – Individual: This is Public Health Informatics

100 pts  **Midterm examination:** 10/11/17

100 pts  **Final examination:** Finals week

15 pts  **Student participation:** Graded in-class activities/assignments, which will be assigned randomly throughout the semester, and weekly discussion board posts will be used to grade participation. Each in-class activity/assignment and weekly discussion board post is worth 1 point. You can earn up to 15 points by actively participating in these experiences. There will be more than 15 points offered so if you miss one opportunity, you can still earn all 15 points. Failure to participate in class activities and repeatedly arriving late or being absent will lower your participation grade.

Final grades are based on the points earned out of the available 300 points described above. Final grades will be assigned based on the following:

<table>
<thead>
<tr>
<th>Percentage of points earned</th>
<th>Final grade</th>
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<tbody>
<tr>
<td>97-100</td>
<td>A+</td>
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<tr>
<td>94-96</td>
<td>A</td>
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<tr>
<td>90-93</td>
<td>A-</td>
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<tr>
<td>87-89</td>
<td>B+</td>
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<td>84-86</td>
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<td>80-83</td>
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<td>77-79</td>
<td>C+</td>
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<tr>
<td>74-76</td>
<td>C</td>
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<tr>
<td>70-73</td>
<td>C-</td>
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<tr>
<td>67-69</td>
<td>D+</td>
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<tr>
<td>64-66</td>
<td>D</td>
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<tr>
<td>60-63</td>
<td>D-</td>
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<tr>
<td>59% and lower</td>
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Please Note:

- Final grades with a .5% or higher will be rounded up; those with a .4% will be rounded down.
- **There will be NO grade negotiation.**
Course Outline / Course Calendar:

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
</table>
| # 1     | 8/30 | • Class Survey https://www.surveymonkey.com/r/9GS2Z9Z  
         |       | • Course Overview  
         |       | • Negatives and positives of technology use | • Introduce Yourself Discussion Board |
| # 2     | 9/6  | • Informatics Competencies  
         |       | • Informatics for Professional Effectiveness  
         |       | • Effective Searching and RSS reader | • Weekly discussion board |
| # 3     | 9/13 | • Data sources and surveillance systems, including electronic health records  
         |       | • Citizen Scientists  
         |       | • Infographic | • Weekly discussion board |
| # 4     | 9/20 | • Intro to Consumer Health Informatics  
         |       | • Digital divide  
         |       | • Readability | • Weekly discussion board  
         |       | • Final project topic due |
| # 5     | 9/27 | • Behavior change applications and health behavior theory  
         |       | • Tailoring  
         |       | • Gamification  
         |       | • Prototypes | • Weekly discussion board |
| # 6     | 10/4 | • Gamification (continued)  
         |       | • Midterm review | • Weekly discussion board |
| # 7     | 10/11| • Midterm Exam | • Midterm Exam |
| # 8     | 10/18| • GIS | • Weekly discussion board |
| # 9     | 10/25| • User-Centered Design | • Weekly discussion board |
| # 10    | 11/1 | • Project rough draft presentations/feedback | • Weekly discussion board |
| # 11    | 11/8 | • Data visualization  
         |       | • Creating an online survey | • Weekly discussion board |
| # 12    | 11/15| • Understanding the PHI infrastructure at national, state, and local levels  
         |       | • EHR  
         |       | • Pretesting your online survey | • Weekly discussion board |
| 11/22   | Thanksgiving BREAK | | |
| # 13    | 11/29| • Data exchange: Functionality/Standards/Interoperability/Security | • Weekly discussion board  
         |       | • This is Public Health Informatics Assignment due |
| # 14    | 12/6 | • Health 2.0  
         |       | • This is Public Health Informatics slide show  
         |       | • Course wrap-up and Final Exam review | • Weekly discussion board  
         |       | • Final project and paper due |
| TBD     |      | • Final Exam – Do NOT make your travel plans until final exam schedule comes out | • Final Exam |
### Session Outline

**Session 1** 8/30

**Topic:** Course Overview – Introduction to Public Health Informatics

**Learning Objectives for Session**

1. Define public health informatics and consumer health informatics
2. Compare and contrast the fields of public health informatics with other informatics fields
3. Describe negatives and positives associated with technology use

**Required readings**

**In-Class Activities**
- Class survey https://www.surveymonkey.com/r/9GS2Z92

**Assignments**
- Introduce Yourself Discussion Board

**Session 2** 9/6

**Topics:** Informatics Competencies, Informatics for Professional Effectiveness

**Learning Objectives for Session**

4. Understand the informatics competencies for professional effectiveness
5. Demonstrate use of technology for professional competency and efficiency

**Required readings**

**In-Class Activities**
- In-class search assignment
- In-class set up RSS reader
- Mendeley demonstration

**Assignments**
- Discussion Board

**Session 3** 9/13

**Topics:**
- Data sources and surveillance systems, including electronic health records
- Citizen Scientists
- Infographics

**Learning Objectives for Session**

6. Describe current and evolving US public health surveillance systems
7. Use information technology to support scientific inquiry for public health by locating, accessing, using, and interpreting online health data and information
8. Define EHR and explain how electronic health records can benefit public health
9. Demonstrate data visualization strategies to improve communication of health information

**Required readings**


### In-Class Activities

- Community Health Profile Activity and Infographic

### Assignments
- Discussion Board

<table>
<thead>
<tr>
<th>Session 4</th>
<th>9/20</th>
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</thead>
<tbody>
<tr>
<td><strong>Topics:</strong></td>
<td></td>
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<tr>
<td>• Intro to Consumer Health Informatics</td>
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<tr>
<td>• Quantified Self and Wearables</td>
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<tr>
<td>• Digital Divide</td>
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<tr>
<td>• Readability</td>
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**Learning Objectives for Session**

10. Describe how consumers use the Internet and technology for health
11. Discuss the digital divide and describe efforts to address inequities
12. Assess the quality of online applications and websites used by consumers
13. Demonstrate strategies for testing readability of documents

**Required readings**


**In-Class Activities**

- Assessing quality
- Assessing readability

**Assignments**
- Discussion Board

<table>
<thead>
<tr>
<th>Session 5</th>
<th>9/27</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topics:</strong></td>
<td></td>
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<tr>
<td>• Application of health behavior theory to behavior change applications</td>
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<tr>
<td>• Tailoring</td>
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<tr>
<td>• Gamification</td>
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<td>• Prototypes</td>
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</table>

**Learning Objectives for Session**

14. Describe how health behavior theory has been used in online applications
15. Describe how gamification has been applied to games for health
16. Create a Powerpoint prototype for an app or game

**Required readings**


**In-Class Activities**

- Behavior change app critique
- Using powerpoint to create a prototype app or game

**Assignments**
- Discussion Board

<table>
<thead>
<tr>
<th>Session 6</th>
<th>10/4</th>
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</thead>
<tbody>
<tr>
<td><strong>Topics:</strong></td>
<td></td>
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<tr>
<td>• Gamification (continued)</td>
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</tbody>
</table>
### Learning Objectives for Session 17.
17. Describe how gamification has been applied to games for health

### Required readings

### In-Class Activities
- Continue prototype app or game

### Assignments
- Discussion Board

### Session 8
**Topics:**
- Midterm exam

### In-Class Activities
- Introduction to HTML programming

### Session 7
**Topics:**
- Geographical Information Systems

### Learning Objectives for Session 18.
18. Describe the basic components of GIS and create a map using Google Fusion

### Required readings

### In-Class Activities
- Make a Google Fusion map

### Assignments
- Discussion Board
- Online survey and report due

### Session 9
**Topics:**
- User-centered design

### Learning Objectives for Session 19.
19. Explain the purposes and process of user-centered development and usability testing
20. Demonstrate ability to conduct and document a usability test

### Required readings

### In-Class Activities
- Usability testing

### Assignments
- Discussion Board

### Session 10
**Topics:**
- Final Project Rough Draft Presentations and Critiques

### Session 11
### Topics:
- Data Visualization
- Creating an online survey

### Learning Objectives for Session
- Demonstrate data visualization strategies to improve communication of health information.
- Demonstrate ability to create an online survey.
- Understand ethics pertaining to online research and data sharing.

### Required readings

### In-Class Activities
- Make a word cloud
- Make Excel charts
- Develop an online survey

### Assignments
- Discussion Board
- Final Project Progress Report/Rough Draft

### Session 12  11/15
**Topics:** Understanding the PHI infrastructure at national, state, and local levels

### Learning Objectives for Session
- Describe the US health informatics infrastructure at the national, state, and local levels.

### Required readings

### In-Class Activities
- Pretest your online survey

### Assignments
- Discussion Board

### Session 13  11/22
**Thanksgiving BREAK**

### Session 14  11/29
**Topics:** Data exchange: Functionality/Standards/ Interoperability/ Security

### Learning Objectives for Session
- Describe the benefits and challenges of electronic health records and an interconnected healthcare system.
- Describe how standards, interoperability, & security affect the development of an interconnected system.

### Required readings

<table>
<thead>
<tr>
<th>In-Class Activities</th>
<th>12/6</th>
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<tbody>
<tr>
<td>Assignments</td>
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<tr>
<td>• TBD</td>
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<tr>
<td>• Discussion Board</td>
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| Session 15                                |      |
| Topics:                                   |      |
| • Health 2.0 and Social Media             |      |
| • This is public health informatics slide show |  |
| • Final review                            |      |

**Learning Objectives for Session**

26. Explain Health 2.0 and its impact on health and research

**Required readings**


<table>
<thead>
<tr>
<th>In-Class Activities</th>
<th>12/6</th>
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<tbody>
<tr>
<td>Assignments</td>
<td></td>
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<tr>
<td>• Twitter analysis</td>
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</table>

| Assignments                               |      |
| • Discussion Board                        |      |