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 practice and research. 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. Describe the US health informatics infrastructure at the national, state, and local levels
9. Define EHR and explain how electronic health records can benefit public health
10. Describe the benefits and challenges of electronic health records and an interconnected healthcare
11. Demonstrate ability to create an online survey
12. Understand ethics pertaining to online research and data sharing
13. Demonstrate data visualization strategies to improve communication of health information Describe the basic components of GIS and create a map showing health data
14. Describe how consumers use the Internet for health
15. Discuss the digital divide and describe efforts to address inequities
16. Assess the quality of online applications and websites used by consumers
17. Demonstrate strategies for testing readability of documents
18. Explain the purposes and process of user-centered development and usability testing
19. Demonstrate ability to conduct and document a usability test
20. Describe how health behavior theory has been used in online applications
21. Describe how gamification has been applied to games for health
22. Explain Health 2.0 and its impact on public health practice and research
23. Be familiar with how public health practitioners can benefit from social media use
Program Competencies Addressed in this Course:
The following competencies for the Public Health Science and Behavioral and Community Health 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.

Skills Learned or Reinforced in this Course: Students will develop skills related to the use of technology in public health practice, including strategic use of technology to promote health, use of technology for professional effectiveness, communication, surveillance, information access, and security.

Required Texts and Other Readings: No textbook is required for this class. Current peer-reviewed journal articles, reports, videos, and podcasts 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. At times, you will be asked to access free software, which will require the creation of an account. We will be using Microsoft Office, Adobe Creative Cloud programs (Adobe Spark, Adobe Premiere Rush, Adobe XD), and Tableau. You can download Office 365 and Adobe products from Terpware, and Tableau for Students from the Tableau website (https://www.tableau.com/).

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. 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 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), two shorter assignments (one group and one individual) a multi-component final project, and online discussion boards.**Note that final examinations are scheduled by the university and often do not occur during typical class days/times. The schedule is provided to students as soon as possible. Students are expected to attend the final exam as scheduled and should plan accordingly. PLEASE DO NOT PLAN END-OF-SEMESTER TRAVEL UNTIL FINAL EXAM SCHEDULE HAS BEEN POSTED.
BASIC NEEDS SECURITY
If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live and believe this may affect your performance in this course, please visit http://go.umd.edu/basic-needs for information about resources the campus offers you and let me know if I can help in any way.

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.
Non-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: SPH 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. Use Canvas to send email to the instructor. Your emails 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 and assignments due to inclement weather and campus emergencies. Generally, lecture content and materials will be uploaded. If the university closes on an exam date, the exam will be given in the next class.

Available Support Services:
- Office hours – Wednesdays 3-4 or by appointment
- Campus Resources – https://education.umd.edu/student-resources/student-campus-resources
- Campus Counseling and Health Services - https://studentaffairs.umd.edu/counseling-health
Grading Procedures:

200 pts **This is Public Health Informatics Group Project:** Each group will choose a topic and complete the multi-component project:

<table>
<thead>
<tr>
<th>Component</th>
<th>Due Date</th>
<th>Points Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1 - Project Proposal and Contract</td>
<td>9/10/19</td>
<td>25</td>
</tr>
<tr>
<td>Part 2a - Visual Abstract (individual)</td>
<td>9/17/19</td>
<td>25</td>
</tr>
<tr>
<td>Part 2b – Literature Review Summary</td>
<td>9/24/19</td>
<td>25</td>
</tr>
<tr>
<td>Part 3a – Interview Guides</td>
<td>9/24/19</td>
<td>25</td>
</tr>
<tr>
<td>Part 3b – Interview Summary</td>
<td>10/22/19</td>
<td>25</td>
</tr>
<tr>
<td>Part 4 – Final video</td>
<td>12/3/19</td>
<td>50</td>
</tr>
<tr>
<td>Part 5 – Lessons Learned &amp; Peer Review (individual)</td>
<td>12/4/19</td>
<td>25</td>
</tr>
</tbody>
</table>

100 pts **Midterm examination:** 10/2/19

100 pts **Final examination:** Finals week

50 pts **Design a health department app:** Due 10/16/19. You will work in groups. Your team will use Adobe XD to create an app for a local health department to enable the general public to access restaurant inspection findings in your county. Your app should allow search by restaurant name, zip code, or current location. Ultimately, the user should be able to find the date of the inspection, the overall rating, and specific findings for a restaurant.

50 pts **Use of health app or wearable:** Due 11/20/19. You will use a health app or wearable for one week. You will create a visual journal on an Adobe Spark page consisting of 5 journal entries (each ~150 words) with screenshots describing your experience (description of features used, what you liked/disliked, impact on your behavior), and conclude with a 1-paragraph summary of your experience with any recommendations to improve the app.

50 pts **Discussion board posts:** Weekly written responses to readings on designated discussion boards (no more than 250 words). Each is worth 5 points and you can earn up to 50 points. There are 11 discussion boards, with only 10 counting toward your grade so you can miss one and still earn full credit. No bonus points awarded for completing 11.

**Late Assignments:** If you miss a Homework Assignment or Final Project deadlines, your grade will be reduced by 10% for each day. If it is not turned in after two days have passed, you will be assigned a grade of 0 points.

Final grades are based on the points earned out of the available 550 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>
<th>PERCENTAGE of points earned</th>
<th>Final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-100</td>
<td>A+</td>
<td>73-76</td>
<td>C</td>
</tr>
<tr>
<td>93-96</td>
<td>A</td>
<td>70-72</td>
<td>C</td>
</tr>
<tr>
<td>90-92</td>
<td>A-</td>
<td>67-69</td>
<td>D+</td>
</tr>
<tr>
<td>87-89</td>
<td>B+</td>
<td>63-66</td>
<td>D</td>
</tr>
<tr>
<td>83-86</td>
<td>B</td>
<td>60-62</td>
<td>D-</td>
</tr>
<tr>
<td>80-82</td>
<td>B-</td>
<td>59% and lower</td>
<td>F</td>
</tr>
<tr>
<td>77-79</td>
<td>C+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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       | 8/28 | • Class Survey: https://goo.gl/forms/ucsGATmcnN9kCkRv1  
          • Course Overview – What is public health informatics  
          • Negatives and positives of technology use | • Discussion Board - Introduce yourself infographic |
| 2       | 9/4  | • Informatics competencies  
          • Databases for Public Health  
          • Effective Searching  
          • RSS | • Discussion Board  
          • Form Project Groups |
| 3       | 9/11 | • Data sources and surveillance systems, including EHRs  
          • Citizen Scientists  
          • Community Health Profile | • Discussion Board  
          • Final Project Part 1 due 9/10/19 |
| 4       | 9/18 | • PHI Infrastructure  
          • Explore State and Local PH online presence  
          • Design an App Group Assignment | • Discussion Board  
          • Final Project Part 2a due 9/17/19 |
| 5       | 9/25 | • EHR  
          • Interoperability/Standards/Security | • Discussion Board  
          • Final Project Part 2b/3a due 9/24/19 |
| 6       | 10/2 | • Midterm | • Discussion Board |
| 7       | 10/9 | • Online Surveys | • Discussion Board |
| 8       | 10/16 | • Data Visualization | • Discussion Board  
          • Design-an-App Assignment due 10/15/19 |
| 9       | 10/23 | • GIS Mapping | • Discussion Board  
          • Final Project Part 3b Findings due 10/22/19 |
| 10      | 10/30 | • Intro to Consumer Health Informatics  
          • Digital divide  
          • Readability | • Discussion Board  
          • Start your 1-week experience with a health app or wearable |
| 11      | 11/6 | • User-Centered Design | • Discussion Board |
| 12      | 11/13 | • Behavior change applications and health behavior theory  
          • Tailoring  
          • Gamification | • Discussion Board |
| 13      | 11/20 | • Health 2.0 | • Use of health app or wearable summary due 11/19/20 |
| **11/27** | HAPPY THANKSGIVING! | | |
| 14      | 12/4 | • This is Public Health Informatics video show  
          • Course wrap-up and review | • Final Project Part 4 Video due 12/3/19  
          • Part 5 Lessons Learned/Peer Review due 12/4/19 |
<p>| <strong>TBA</strong> | Final Examination – schedule (day/time) to be announced. | | |</p>
<table>
<thead>
<tr>
<th>Session Outline</th>
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<tbody>
<tr>
<td><strong>Session 1</strong></td>
</tr>
<tr>
<td><strong>Topic:</strong> Course Overview – Introduction to Public Health Informatics</td>
</tr>
<tr>
<td><strong>8/28/19</strong></td>
</tr>
<tr>
<td><strong>Learning Objectives for Session</strong></td>
</tr>
<tr>
<td>1. Define public health informatics and consumer health informatics</td>
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<td><strong>Required readings</strong></td>
</tr>
<tr>
<td>• Podcast: How to explain Informatics to your family and friends. Available: <a href="https://phii.org/blog/explaining-informatics">https://phii.org/blog/explaining-informatics</a></td>
</tr>
<tr>
<td><strong>In-Class Activities</strong></td>
</tr>
<tr>
<td>• Class survey - <a href="https://forms.gle/YDvmSbZVGMywYRdS9">https://forms.gle/YDvmSbZVGMywYRdS9</a></td>
</tr>
<tr>
<td>• Start your infographic</td>
</tr>
<tr>
<td><strong>Assignments</strong></td>
</tr>
<tr>
<td>• Introduce Yourself Discussion Board with Infographic</td>
</tr>
<tr>
<td><strong>Session 2</strong></td>
</tr>
<tr>
<td><strong>9/4/19</strong></td>
</tr>
<tr>
<td><strong>Topics:</strong> Competencies/Databases for Public Health/Effective Searching/RSS Feeds</td>
</tr>
<tr>
<td><strong>Learning Objectives for Session</strong></td>
</tr>
<tr>
<td>4. Understand the informatics competencies for professional effectiveness</td>
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<tr>
<td>5. Demonstrate use of technology for professional competency and efficiency</td>
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<tr>
<td><strong>Required readings</strong></td>
</tr>
<tr>
<td><strong>In-Class Activities</strong></td>
</tr>
<tr>
<td>• Form final project groups. Work on Part 1.</td>
</tr>
<tr>
<td>• Search assignment</td>
</tr>
<tr>
<td>• Set up RSS reader</td>
</tr>
<tr>
<td><strong>Assignments</strong></td>
</tr>
<tr>
<td>• Discussion Board</td>
</tr>
<tr>
<td><strong>Session 3</strong></td>
</tr>
<tr>
<td><strong>9/11/19</strong></td>
</tr>
<tr>
<td><strong>Topics:</strong> Data sources and surveillance systems, including EHR/Citizen Scientists/Infographics</td>
</tr>
<tr>
<td><strong>Learning Objectives for Session</strong></td>
</tr>
<tr>
<td>6. Describe current and evolving US public health surveillance systems</td>
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<tr>
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<tr>
<td><strong>In-Class Activities</strong></td>
</tr>
<tr>
<td>• Community Health Profile Activity</td>
</tr>
<tr>
<td><strong>Assignments</strong></td>
</tr>
<tr>
<td>• Discussion Board</td>
</tr>
<tr>
<td>• Final Project Part 1 Proposal and Contract due</td>
</tr>
</tbody>
</table>
### Session 4  
**9/18/19**

**Topics:** Understanding the PHI infrastructure at national, state, and local levels

**Learning Objectives for Session**

8. Describe the US health informatics infrastructure at the national, state, and local levels

**Required readings**


http://doi.org/10.10007/978-1-4471-4237-9_4

Public Health Informatics Institutes: Podcast: NYC Macrooscope, EHRs and population health surveillance.  
Available: https://www.phii.org/blog/podcast-nyc-macrooscope-ehrs-and-population-health-surveillance

**In-Class Activities**

- Design an app for a local health department

**Assignments**

- Discussion Board
- Final Project Part 2a

### Session 5  
**9/25/19**

**Topics:** Electronic Health Records/Interoperability, Standards, Security/Personal Security

**Learning Objectives for Session**

9. Define EHR and explain how electronic health records can benefit public health
10. Describe the benefits and challenges of electronic health records and an interconnected healthcare system
11. Describe how standards, interoperability, & security affect the development of an interconnected system

**Required readings**

http://doi.org/10.1146/annurev-publhealth-031914-122747

Public Health Informatics Institutes: Podcast: Chicago’s demonstration project for STI electronic case reporting.  

**In-Class Activities**

- TBA

**Assignments**

- Discussion Board
- Final Project Part 2b Literature Review Summary and Part 3a Interview Guides due

### Session 6  
**10/2/19**

**Midterm**

### Session 7  
**10/9/19**

**Topics:** Creating an online survey

**Learning Objectives for Session**

12. Demonstrate ability to create an online survey
13. Understand ethics pertaining to online research and data sharing

**Required readings**


**In-Class Activities**

- Develop and pretest an online survey

**Assignments**

- Discussion Board

### Session 8  
**10/16/19**

**Topics:** Data Visualization
# Learning Objectives for Session 14

14. Demonstrate data visualization strategies to improve communication of health information

## Required readings


## In-Class Activities

- Make a word cloud
- Make Excel charts

## Assignments

- Discussion Board
- Design an App Assignment due

### Session 9  10/23/19

**Topics: Geographical Information Systems**

## Learning Objectives for Session 15

15. Describe the basic components of GIS and create a map using Google Fusion

## Required readings


## In-Class Activities

- Make maps with Tableau

## Assignments

- Discussion Board
- Final Project Part 3 Interview Summary due

### Session 10  10/30/19

**Topics: Intro to Consumer Health Informatics/Digital Divide/Readability**

## Learning Objectives for Session 16

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

## Required readings


## In-Class Activities

- Assessing quality
- Assessing readability

## Assignments

- Discussion Board
- Start your behavior change app assignment

### Session 11  11/6/19

**Topics: User-centered design/Usability testing**

## Learning Objectives for Session 20

20. Explain the purposes and process of user-centered development and usability testing
21. Demonstrate ability to conduct and document a usability test
**Required readings**


**In-Class Activities**

- Usability testing

**Assignments**

- Discussion Board

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**Session 12**

**Topics:** Behavior change apps /Tailoring/Gamification

**Learning Objectives for Session**

22. Describe how health behavior theory has been used in online applications
23. Describe how gamification has been applied to games for health

**Required readings**


**In-Class Activities**

- Using powerpoint to create a prototype app or game

**Assignments**

- Discussion Board

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**Session 13**

**Topics:** Health 2.0 and Social Media

**Learning Objectives for Session**

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

**Required readings**


**Assignments**

- Behavior change app critique due
- Discussion Board

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**Happy Thanksgiving!**

**Session 14**

**Topics:** Class Wrap-Up

**In-Class Activities**

- Watch videos

**Assignments**

- Final Project Part 4 Video and Part 5 Lessons Learned and Peer Evaluation due
Additional Literature, Websites and Other Resources:

- Purdue Online Writing Lab – APA Formatting and Style Guide: 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/
- Journal of Medical Informatics Research - 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.