HPM 625 (section 001)
Applied Health Informatics: Diagnosis and Design of Multilevel Intelligence for a Smart Health System
(3 Credit Hours)
Department of Health Policy and Management
School of Public Health

Spring 2015 Syllabus
Class Location (TBD)
Meeting Times Wednesdays (4:40-7:40pm)

Faculty: Timothy Jay Carney
Office: 1101-C McGavran-Greenberg
Email: tcarney@unc.edu
Phone: 919.966.6907
Office Hours: TBD

TA: Location: Email: Phone: Office Hours:

Course Overview

This course will expose students to the theory and principles shaping decision support systems. Examine case-studies in decision support system needs assessment and design from multiple stakeholder perspectives (e.g., patients, providers, administrators, public health practitioners).

Students will learn about the organizational, technical, and human factors that shape decision support systems success in fostering a smart, learning, and high performance environment.

This course will enable students to diagnose stakeholder decision making needs and conceptually model a decision support solution for their desired audience.

Students will gain knowledge of the basics of decision support through examining a variety of case-studies the review all stages of decision support from diagnosis to design in areas of that range from personalized smart devices, chronic care management, health disparities, public health management.

Resources

Website

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HPM 625 has its own Sakai website. All course materials are in the Course Resources tab.

Books

**Primary Textbooks**
Clinical Decision Support (Second Edition)  
The Road to Broad Adoption  
Edited by Robert A. Greenes  
ISBN: 978-0-12-398476-0  
(available online free PDF download)  

Public Health Intelligence  
Issues of Measure and Method  
Editors: Krishna Regmi, Ivan Gee  
ISBN: 978-3-319-28324-1 (Print) 978-3-319-28326-5 (Online)  
(available online free PDF download)  

**Additional Readings may be assigned throughout the course on a weekly basis**
Journal articles and other readings as assigned by instructor

**Articles**

Available through Electronic Reserve via Sakai in the Course Resources tab, organized by week.

**Web Sources**

A list of web resources will be complied by both the instructor and students as the semester progresses

**Other Resources**

Other resources will be identified where the instructor and students agree they can aid in learning

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**Requirements and Expectations**

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<tr>
<th>TJC</th>
<th>Class participants</th>
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Spring 2017

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Be ready to learn and teach | Be ready to learn and teach
---|---
Select carefully integrated set of readings | This semester, sometimes skimming will suffice! However, active, thoughtful engagement with concepts and tools before each session remains vital. Please devote ~6 hours to preparing for each session.

Provide specific guidance on readings to maximize efficiency of participants’ preparation time (see reading list below) | Post thought-provoking discussion questions for each session as well as any additional materials requested

Respond w/in 24 (or 36 on a bad day) hours to emails | Email with advance notice if missing a class or not contributing materials. Submit all assignments on time

Be available in office hours or by appointment to provide feedback and advice on assignments | Respect questions asked and project length – it’s important to be succinct! Be ready to talk with classmates about your thoughts

**Discussion Forums:**

**Course Format**

Directed readings, streaming videos, web based lectures, guest speakers, and threaded discussions

**Course Competencies**

Upon the successful completion of the course, the student will be able to:

1. Understand the value of a highly effective information/knowledge culture in support of public health and health care delivery decision making needs to address population health needs.
2. Identify the socio-technical (organizational, technical, and human) factors, theory, and principles that shape decision support systems success.
3. Construct an assessment strategy to diagnoses and design a smart health system for care delivery and public health decision making.
4. Learn how to conceptually model a decision support solution for your target audience.
5. Examine lessons learned, best practices, and practice issues from real-world case-studies decided to all aspects of decision support.
6. Understand and appreciate the basics of decision support systems from both the user’s and developer’s perspective.
Class structure -- modules

The course is comprised of three main avenues of learning that consist of: (1) understanding the basic principles of decision support from a variety of stakeholder perspectives, (2) understanding the basics principles of population health management and how decision support is applied, and (3) examining applied cases studies of decision support systems diagnosis and design in meeting health care delivery and public health practice objectives. The background lectures will provide core theories, definitions, and principles surrounding decision support that fosters smarter health.

Class Participation

I will expect all participants to be prepared to address anyone’s questions about any reading during each session. Please be prepared to cite pages/tables/figures within readings to enhance the specificity and thus utility of our conversations. I will discourage sweeping statements in favor of concrete and careful articulations of your understanding-in-progress of each concept or tool and its relevance to health.

Case-Study Summaries

Students will be expected to summarize each case-study (based on chapter readings) and be prepared to present and discuss the case each class session. Students will expected to provide reports on their developing decision support problem (based on their own individual or group interest) over the course of the semester. This will represent opportunities for students to demonstrate comprehension of the readings, discussions points, and real-world applications. Each student will submit a 1-2 page case-study briefing highlighting how it relates to their specific to their specific public health/health care delivery topic of interest.

In some cases where guess speakers may appear in class a review of the guest lecture’s topic/material may be used in lieu of the case-study obtained from our readings. Students will be alerted ahead of time when such changes may occur in the scheduling.

Project proposals

Depending on class size and number of case study assignments students will be divided into small groups (2-4) or carried out individually. During each learning module students will have the opportunity to present their respective strategy in their evolving decision support problem to include: (1) Introduction and Problem Statement, (2) Strategic Plan, (3) Survey and Assessment Plan, (4) Technology Plan, (5) Execution Strategy, and (6) Evaluation Plan for addressing one or more public health or health care delivery issues.

The mid-term and final will be divided in two sections…The written report and presentation:

- The written report
  - Mid-term (no more than 5 pages)
  - Final (no more than 15 pages (inclusive of the 5 page mid-term report)

This report will represent your complete idea from start to finish which will include:

- Introduction and Problem statement (what is the problem and why should we care)
- Background and significance (your review of the literature from our readings (8 - 15 references) (listed at the end as references cited...use APA or whatever you’re comfortable with)
- Your Decision Support Conceptual Model

The target audience (can include but not be limited to healthcare leaders, public health officials, boards of health members, health systems planners, patients, physicians, policy makers, researchers and those evaluating the direction of the healthcare and wellness industry, etc.)

- Outline your proposed informatics solution (e.g., decision support system, integrated information system, community knowledge exchange portal, disease registry, etc.) application in brief
Present your use-case flow diagram
- Outline conclusions, limitations, implementation challenges, and next steps

The presentation
- Mid-term 10 to 15 minutes outlining the Introduction and Chapters 1-3 of your Decision Support Problem Report
- Final 20 minute presentation on your problem and proposed solution

Due dates (I will need to check and confirm with Lynette on these):
- Oral presentation – Due last day of class
- Written report – Due on your final exam date

Cell Phones and Laptops
Turn off cell phones in class and during exams. Laptops may be used in class only for taking notes and for looking up information relevant to the topic being discussed.

Evaluation Method

Honors level will reflect consistently timely submission of all deliverables; thoughtful questions and additional preparatory materials (i.e., genuinely grappling with the ideas at hand); consistently engaged and constructive participation in class; and high quality submissions for the intelligence briefings, case study reports, and final project. I do not grade on curves (i.e., force distributions) but do grade to reflect the actual diversity of performance in any given class.

Grade Components
The grading system for this course focuses on four essential components: Weekly Actionable Intelligence Briefings, In-class and/or online discussion participation, and case study assignments, and a final group project assignment. The weights assigned to these four components are as follows:

<table>
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<tr>
<th>Grade Components</th>
<th>% of Grade</th>
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<tbody>
<tr>
<td>Weekly assignment; Design Support Case Study Summaries</td>
<td>40%</td>
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<tr>
<td>In-Class and Online Discussions</td>
<td>10%</td>
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<tr>
<td>Mid-term Assignment (Parts 1-3 of Decision Support Problem and Solution Report with Conceptual model) no more than 5 page written summary and PPT presentation</td>
<td>25%</td>
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<tr>
<td>Final Assignment (Parts 4-6 of Decision Support Problem and Solution Report with refined Conceptual model) no more than 15 page written summary (inclusive of mid-term report) and PPT presentation</td>
<td>25%</td>
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<tr>
<td>TOTAL 100%</td>
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Grade Scale

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Your final grade will be computed as the weighted average of your scores on the course requirements. The following scale will be used to convert numeric scores into letter grades:

<table>
<thead>
<tr>
<th>Graduate Scale</th>
<th>Undergraduate Scale</th>
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<tbody>
<tr>
<td>94 - 100</td>
<td>H</td>
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<tr>
<td>90 - 93</td>
<td>H-</td>
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<tr>
<td>87 - 89</td>
<td>P+</td>
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<td>83 - 86</td>
<td>P</td>
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<td>80 - 82</td>
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<td>77 - 79</td>
<td>L+</td>
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<tr>
<td>73 - 76</td>
<td>L</td>
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<tr>
<td>70 - 72</td>
<td>L-</td>
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<tr>
<td>69 or below</td>
<td>F</td>
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<tr>
<td>67 - 69</td>
<td>D+</td>
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<tr>
<td>63 - 66</td>
<td>D</td>
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<tr>
<td>60 - 62</td>
<td>D-</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
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**NOTE:** Numerical grade ranges above are without rounding (e.g., 94 = 94.00). For example, 89.5 does not equate to an H-. Instructor discretion may be used in determining whether to round numerical grades, depending on the distribution of grades. Also, a student’s grade may be adjusted upward one level (e.g., from P+ to H-) if the quality of the student’s participation in class warrants.

**UNC Honor Code**
The principles of academic honesty, integrity, and responsible citizenship govern the performance of all academic work and student conduct at the University as they have during the long life of this institution. Your acceptance of enrollment in the University presupposes a commitment to the principles embodied in the Code of Student Conduct and a respect for this most significant Carolina tradition. Your reward is in the practice of these principles.

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 (966-4084) or the Office of the Dean of Students (966-4042).

Read “The Instrument of Student Judicial Governance” (http://instrument.unc.edu).

Recognizing, Valuing, and Encouraging Diversity

The importance of diversity is recognized in the mission statement of HPM. In the classroom, diversity strengthens the products, enriches the learning, and broadens the perspectives of all in the class. Diversity requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity.

Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to “diversity of presence,” including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation, social position, and veteran status.

Course Evaluation

The Department of Health Policy and Management is participating in the Carolina Course Evaluation System (CES), the university's online course evaluation tool, enabled at the end of each semester. Your responses will be anonymous, with feedback provided in the aggregate; open-ended comments will be shared with instructors, but not identified with individual
students. I use this feedback to improve learning experiences for subsequent cohorts, and so will ask all of you to take a few minutes to complete the survey. Thank you in advance.

Note All Readings are from:
- Clinical Decision Support (CDS) Textbook by Robert A. Greenes
- Public Health Intelligence (PHI) Textbook Krishna Regmi, Ivan Gee
- Assigned Articles (as seen below but additional readings may be assigned no later than one week before class session)

Course Schedule

Background

Intelligence Overviews by Stakeholder Perspectives (Section 1)
Lecture 1 Public Health Perspective (Part 1): Public Health Intelligence – The UK Perspective
- PHI Textbook – Chapter 1 Public Health Intelligence: An Overview Krishna Regmi, Neil Bendel, Ivan Gee
- (SKIM ONLY) PHI Textbook – Chapter 3 Epidemiology and Public Health Intelligence
- Isabelle Bray, Krishna Regmi
- PHI Textbook – Chapter 3 Types of Data and Measures of Disease, Jacqui Dorman, Ivan Gee

Lecture 2 Public Health Perspective (Part 2): Public Health Intelligence – The focus on Surveillance in US and Abroad
- PHI Textbook – Chapter 5 Public Health Surveillance Ruth Gilbert, Susan J. Cliffe
- Morse, S. Global Infectious Disease Surveillance and Health Intelligence. Health Affairs. 2007.

Lecture 3 – Health Care Delivery Perspective: Monitoring and Tracking Systems for Population Health and Clinical Decision Intelligence
- Chapter 13 - Big Data and Population-Based Decision Support, Pages 363-381, Michael A. Krall, Adi V. Gundlapalli, Matthew H. Samore
- Other readings to be assigned

Lecture 4 – The Community Health Perspective: Community Health Assessments – The Kaiser Permanente Model
- PHI Textbook Chapter 9 - Health Needs Assessment Patrick Tobi
- [Slide Presentation] Population Centric Intelligence: Using Data Segmentation and Community Health Assessments for Better Patient Insights Charles Boicey, MS, RN-BC, CPHIMS President American Nursing Informatics Association
- Kaiser Permanente Community Health Needs Assessment Toolkit
  o Part I: Overview, Pre-Assessment, & Data Collection

Lecture 5 – The Individual Consumer Perspective: Personalized/Precision Medicine Perspective and Smart Tech
- CDS Textbook Chapter 14 - Clinical Decision Support for Personalized Medicine, Pages 383-413, Brandon M. Welch, Kensaku Kawamoto, Brian Drohan, Kevin S. Hughes
- Other readings to be assigned
Lecture 6 – The Global Health Perspective: The Global Aids PEPFAR Technology Challenges
- PEPFAR Information Management Systems Briefing Document
- Other readings to be assigned

Understanding the Technology of Building Decision Support and Managing Stakeholder Intelligence: Theory and Applications (Section 2)

Lecture 7 – Overview of Computerized Decision Support
- CDS Textbook - Chapter 1 - Definition, Scope, and Challenges
- Other readings to be assigned

Lecture 8 – Informatics Tools for Organizing and Representing Intelligence – The Basics of Ontologies in Health Care Decision Support
- An ontology-based personalization of health-care knowledge to support clinical decisions for chronically ill patients by David Riañoa et al. Journal of Biomedical Informatics Volume 45, Issue 3, June 2012, Pages 429–446

Lecture 9 – Modeling your Decision Support Problem, the System (people and organizations), and your Solution (one size does not fit all)
- PHI Textbook - Modelling in Public Health Adam Briggs, Peter Scarborough, Adrian Smith

Lecture 10 – The Theory of a Learning Organization and a Learning Health System
- Conceptualising and creating a global learning health system Charles Friedman, Michael Rigby
- From Individual Learning to Organizational Learning Delio Ignacio Castaneda and Manuel Fernández Rios
- Organizational Learning in Health Care Organizations Savithiri Ratnapalan and Elizabeth Uleryk

Lecture 10 – Applied Models of Decision Support
- A Knowledge Management Framework for the Support of Decision Making in Humanitarian Assistance/Disaster Relief Dongsong Zhang, Lina Zhou and Jay F. Nunamaker Jr
- An Intelligent-Agent Based Decision Support System for a Complex Command and Control Application Ptamen V. Petrov, 21st Century Systems, Inc
- Analysis of Complex Decision-Making Processes in Health Care: Cognitive Approaches to Health Informatics Andre W. Kushniruk
- Developing Computational Models of Recognition-Primed Decision Making by Walter Warwick, Ph.D., Stacey McIlwaine at Micro Analysis and Design

Putting it all Together in an Applied Manner (Section 3)

Lecture 11 – Open Session to discuss and review your decision support problem (Part 1 – So what’s the problem and how might you represent it) (readings only if needed to highlight a discussion point)
- Pick at least one perspective
- Pick at least one problem
- Pick at least one method/theory/approach

Lecture 12 – Open Session to discuss and review your decision support problem (readings only if needed to highlight a discussion point)
- Design your decision intelligence protocol for your audience
- Model your proposed solution (As-Is (current state) vs. To-Be (Your solution))
Lecture 13 - Emerging and Future Directions (readings to be assigned)
- Public Health Intelligence
- Clinical Decision Support Adoption, Use, Lessons Learned
- National and Global Initiatives on Patient-Centered, Provider-Centered, and Health Systems-Centered Systems to Keep an Eye on

Lecture 14: Student presentations