Health Services 401
Biomedical and Public Health Informatics
Winter 2007

Instructors:	**Paul Fu, Jr., MD, MPH**	**Alan Tomines, MD**
Phone:	**(310) 222-8088**	**(310) 222-8009**
E-mail:	**pfu@labiomed.org**	**atomines@ladhs.org**

Class Time:	**Wednesday, 2-4:50 pm**
Class Web site:	**http://harbor.informatics.googlepages.com/sphhs401**
Office Hours:	**Please call/e-mail for appointment**

Introduction

An ***information system*** is comprised of computerized data as well as procedures to collect, store, analyze, transfer, and retrieve that data. ***Information technology*** supports these systems and consists of computers, the networks and telecommunications systems that connect them, and the software that operates the computers and networks. Over the past decade, the rapid advances in computing technologies have led to tremendous growth in the development and implementation of ***health care information systems*** and ***public health information systems***. Today, there are applications of technology in every field, from small, targeted applications for basic community health programs and services; to electronic medical record systems for small physician offices to large national IDNs; regional systems tasked with the support of HMO business intelligence needs; to vast national population health databases for health services research.

Biomedical informatics is the scientific field that deals with biomedical data, information, and knowledge — especially focusing upon the storage, retrieval, and optimal use for problem-solving and decision-making. ***Public health informatics*** is the area of study that has arisen to investigate and support the continued integration of technology and public health through the application of information science and technology to public health science, practice, and research. By design, it is broad in scope and is both an academic discipline as well as a practical one.

This course will introduce students to the fields of biomedical and public health informatics, as well examine the impact of information technology upon the practice of healthcare and public health. It will look at the entire process, from systems conceptualization and design, to project planning and development, to system implementation and use.

These broader applications of information systems offer the promise of better health care system performance—improved quality, increased efficiency, and enhanced access. They must also ensure the privacy and security of personal health information stored and transmitted electronically.

Course Objectives

The objectives of the course are:

1. To provide the student with a basic understanding of biomedical and public health informatics
2. To provide the student with the ability to identify, evaluate, and utilize health care and public health data and information sources and resources
3. To describe issues related to information ethics, including privacy, confidentiality, security, and data and information ownership
4. To provide a conceptual and theoretical framework for the design, development, and implementation of public health information systems
5. To provide project evaluation and management skills for information systems projects

6. To describe current biomedical informatics and public health informatics research issues and opportunities.

Textbook and Readings

Readings and cases will be distributed in class and through email. Materials should be read before class so that students can participate fully in the discussions.

The supplemental text for the class is:

> O'Carroll PW, Yasnoff WA, Elizabeth WM, Ripp LH, Martin EL, Guegan YN. *Public Health Informatics and Information Systems*, 2nd Edition, New York: Springer Verlag, 2006.

Copies are available on reserve at the library.

Course Methodology

Theory and conceptual frameworks will be presented by the instructors using lectures, case studies, and class exercises/demonstrations. Discussions and written case analyses will be used to facilitate the application of these concepts and frameworks to real organizational examples. The final project requires the student to apply the knowledge gained in the course.

Prerequisites

The student is expected to have a general familiarity and understanding of basic information technologies and terms. It is recommended that students take HS 251 Process Improvement and Information Systems in Health Care Organizations, but is not required.

Grading

Grades will be assigned based upon class participation and performance on the following assignments:

1. Case analyses (2), each approximately 5-7 double-spaced pages.
2. Final project. Detailed instructions will be handed out in class.

Weighting of the grading components is as follows:

10%	Class participation
20%	1st case analysis
	5% Oral Presentation/15% Report
20%	2nd case analysis
	5% Oral Presentation/15% Report
50%	Final project
	10% Presentation/40% Report

Notes

- Guidelines and instructions for each case analysis will be handed out in class.
- Written case analyses are to be handed in at the beginning of class on the due date.
- Final project presentations will be made on the last session of class.
- Final project reports will be due on the date of the final exam and will be expected to incorporate peer and instructor feedback and comments from the presentation.

Calendar

Session 1 (January 10, 2007): Biomedical and Public Health Informatics

- origins and definitions of biomedical informatics and public health informatics
- informatics competencies
- subdisciplines within informatics

Case Analysis #1 assigned (due Session 4)

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 1 and 2

Session 2 (January 17, 2007): Information Architecture I

- information technology fundamentals
- current information technology (hardware, software, databases, networks, data storage, programming)
- state-of-the-art IT applications (natural language processing, data mining, GIS)
- **Case Study:** CDC Environmental Public Health Tracking (EPHT) (Ying-Ying Meng, DrPH)

Final Project assigned

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 5 and 21

Session 3 (January 24, 2007): Designing for People and Interoperability I

- privacy, confidentiality, security, and supporting technologies
- current legislation and policies
- information ethics
- human-computer interfaces (usability, visualization)

Final Project teams due

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 4, 10, and 25

Session 4 (January 31, 2007): Information Architecture II

- data, information, knowledge, wisdom hierarchy
- data modeling
- process modeling

Class Exercise
Final Project Assignments
Case Analysis #2 assigned (due Session 7)

Readings:

Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 18 and 20

Session 5 (February 7, 2007): Designing for People and Interoperability II

- standards (data, vocabulary, messaging, technology)
- certification (CCHIT)
- **Case Study:** Los Angeles County Bioterrorism Program (Raymond Aller, MD) (tentative)

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 11 and 19

Session 6 (February 14, 2007): The Business of Informatics I

- drivers (quality improvement/assurance, patient safety, pay-for-performance, ROI)
- strategic IT planning and governance
- aligning IS and business strategy
- **Case Study:** Los Angeles County Public Health (Jim Green, CIO) (tentative)

Final Project status check-in
Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 3 and 7

Session 7 (February 21, 2007): The Business of Informatics II

- the project lifecycle
- project management fundamentals
- methodologies, metrics, and mitigation
- change management
- the "F"-word (failure)

Case Analysis #2 due; Class Presentation of Analysis

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapters 8, 9 and 12

Session 8 (February 28, 2007): Health IT Systems I

- the electronic health record (EHR)
- telemedicine
- education (distance education, patient education, continuing education)
- information retrieval (UMLS, XML, search)

Final Project status check-in

Readings:
Handouts

Session 9 (March 7, 2007): Health IT Systems II

- **Field Trip**: VistA EHR at Westwood VA (Caroline Goldzweig, MD, MSHS)

Readings:
Handouts

Session 10 (March 14, 2007): Health IT Systems III

- public health information systems (registries, disease surveillance)
- RHIOs and the NHIN
- knowledge management
- **Case Study:** Long Beach Network for Health (Laura Landry)

Readings:
Handouts
Supplemental: O'Carroll and Yasnoff, Chapter 22, 32, and 34

Final Project Presentation (March 19, 2007)