IUPUI

SCHOOL OF INFORMATICS AND COMPUTING

DEPARTMENT OF BIOHEALTH INFORMATICS

Indiana University–Purdue University Indianapolis

The Design, Implementation, and Evaluation of Electronic Health Record Systems – INFO B513

Spring

Course Info 3 Credit hours

Location Classroom

Prerequisites: None

COURSE DESCRIPTION

Students learn how to design, implement, and evaluate electronic health record (EHR) system and how to use technology to support their data acquisition, storage, reuse, interoperability, exchange, and analysis. They also evaluate their legal, ethical, and regulatory implications and learn how to build teams to manage their implementation in healthcare organizations.

EXTENDED COURSE DESCRIPTION

In this practical course, students analyze the design of existing EHR systems through the example of an open-source platform, OpenMRS. They implement this platform according to international conceptual and markup standards, such as the Health Level 7 Reference Information Model (HL7 RIM) and the Continuity of Care Document (CCD). Students evaluate gaps in the system by comparing it with other Computerized Physician Order Entry (CPOE) systems and create designs for modules. Students evaluate legal, ethical, and regulatory implications of current EHR systems.

INFO B642 Clinical Decision Support Systems is recommended as a corequisite.

Required Text(s):

Title: *Electronic Health Records: Understanding and Using Computerized Medical Records*
Author: *Richard Gartee*
Edition: *2nd edition (February 3, 2011)*
Publisher: *Prentice Hall*
ISBN: *978-0132499767*

Title: *Electronic Health Records*
Author: *Jerome H. Carter*
Edition: *2nd edition (March 15, 2008)*
Publisher: *American College of Physicians*
ISBN: *978-1930513976*

Additional Readings:

Title: *Electronic Health Records: A Practical Guide for Professionals and Organizations*
Author(s): *Margret K. Amatayakul*
Edition: *5th edition (2012)*
Publisher: *AHIMA*
ISBN: *978-1584262916*

- OpenMRS data model https://wiki.openmrs.org/x/BQAJ
- http://www.healthit.gov/providers-professionals/ehr-incentive-programs
- http://www.healthit.gov/providers-professionals/meaningful-use-definition-objectives
- http://www.healthit.gov/providers-professionals/certification-process-ehr-technologies
- Electronic Health Records Overview
- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3065078/

Course Content

Course Schedule

1. Module 1. Background and support for EHRs – 1 week
    a. History and current state of EHRs
    b. Legal issues, privacy, and security of health information

2. Module 2. The Design of EHRs – 4 weeks
    a. Processes in clinical practice
    b. Clinical workflow analysis
    c. Quality improvement using EHRs
    d. Human-computer interaction in point-of-care (CPOE) systems

3. Module 3. The Implementation of EHRs – 5 weeks
    a. Data acquisition, storage, and retrieval techniques in EHRs
    b. Selection and implementation of software and hardware for EHRs
    c. Representing flowsheets, charts, anatomical drawing in EHRs

d. Electronic ordering and requisition systems
e. Messaging and interoperability between various systems

4. Module 4. The Evaluation of EHRs – 4 weeks
    a. Healthcare data reuse: evidence-based medicine and real-world use
    b. Meaningful use definition, incentives, and EHR certifications
    c. Evaluation of EHR systems *in situ*
    d. From process analysis to goal evaluation
    e. Implementation planning and change management

Learning & Professional Outcomes:

Upon completion of this course, the student will

1. Design and implement an EHR system. (6 in Bloom's taxonomy, new version)
2. Evaluate gaps in the EHR system.
3. Describe the role of EHRs, their components, and how they are used in a healthcare system.
4. Apply the laws governing the use of data and technical approaches to ensuring quality and protection of data within EHRs; evaluate their legal, ethical, and regulatory implications.
5. Identify the range of clinical decision support (CDS) tools within the EHR; determine which tool is appropriate for specific situations; analyze how to develop and implement CDS tools to adhere to meaningful use criteria.
6. Describe the processes of developing or selecting an EHR system, preparing and supporting clinicians for system implementation, and evaluating system effectiveness.
7. Identify the key types of EHR systems and describe how to achieve system interoperability.
8. Weigh the nontechnical factors that influence the adoption of EHR systems by clinicians and strategies for promoting effective use of EHR systems.

Soft wares used:

During this course, students will use the following applications:

- OpenMRS cloud installation
- Practice Fusion cloud EMR
- Microsoft Excel 2013

EXPECTATIONS, GUIDELINES, AND POLICIES

This is a three-credit, graduate-level course. In accordance with IUPUI policies and expectations, a 3:1 workload is expected: On-average, in addition to 3 hours in-class, this course should take approximately 12 - 15 hours per week. This workload will increase

dramatically before assignments are due. This translates to a significant commitment of time each week. A graduate course is the equivalent of a rigorous, part-time job (15+ hours per week). Plan accordingly, pace yourself, and frontload your workflow.

Expectations/Guidelines/Policies:

- Attendance and discussion participation
- Two midterms
- Final project
- Final essay

Grading Information:

Assignment	Percentage
Class participation	10%
Midterm 1 (Module 1 and 2)	20%
Midterm 2 (Module 3)	20%
Final Project on EHR Design & Implementation (Module 1–3)	40%
Final Essay on EHR Evaluation Model (Module 4)	10%

Grading Scale:

A+	97 – 100	Outstanding achievement, given at the instructor's discretion
A	93 – 100	Excellent achievement
A–	90 – 092.99	Very good work
B+	87 – 089.99	Good work
B	83 – 086.99	Marginal work
B–	80 – 082.99	Very marginal work
C+	77 – 079.99	Unacceptable work (Core course must be repeated)
C	73 – 076.99	Unacceptable work (Core course must be repeated)
C–	70 – 072.99	Unacceptable work (Elective or core course must be repeated)
D+	67 – 069.99	Unacceptable work (Elective or core course must be repeated)
D	63 – 066.99	Unacceptable work (Elective or core course must be repeated)
D–	60 – 062.99	Unacceptable work (Elective or core course must be repeated)
F	Below 60	Unacceptable work (Elective or core course must be repeated)