MET CS-581

Electronic Health Records

Fall 2018

Syllabus

Location:
CGS 113
and
Online

Day and Time: Monday 6:00 pm – 8:45 pm

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Course Description

Electronic Health Records (EHRs) are application systems that automate the activities of healthcare clinicians including physicians, nurses, physician assistants, and healthcare administrative staff. Use of EHRs dramatically increased over the last five to seven years due to the systems' benefits and federal government programs to deploy EHRs. This increased use of EHRs has many challenges including complex data, high security requirements, integration to multiple application systems, a distributed user base, and broad impact on how these users work. This course will focus on real-world use and deployment of EHRs through readings, hands-on labs and case studies. Students will: (1) Learn the functionality of EHRs through hands-on labs; (2) Learn the technical infrastructure required for EHRs including distributed architecture, network and security design; (3) Understand how EHRs change healthcare delivery workflows and how to manage that change; and (4) Learn best-practices for deploying EHRs including project management, typical budgets, system selection and governmental requirements and funding.

Learning Objectives

- Learn the functionality of EHRs through lectures and hands-on labs
- Learn the technical infrastructure required for EHRs including distributed architecture, network and security design
- Understand how EHRs change healthcare delivery workflows and how to manage that change
- Learn best-practices for deploying EHRs including project management, typical budgets, system selection and governmental requirements and funding
- Collect a set of tools to use in EHR and other enterprise system deployment programs
- Present results of their work in a "real-world" fashion including class presentations and written assignments
- Introduce students to the applied, "real-world" deployment of enterprise application systems in general
- Encourage independent, analytical thinking about the challenges of deploying EHRs and how to address them

In pursuing these objectives, the course will:

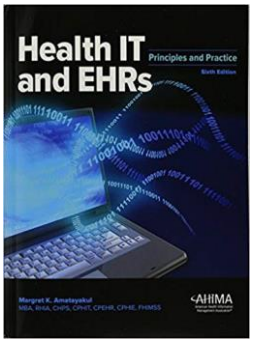
- Use textbooks, current news items, government reports and publications lectures, and cases
- Use projects that apply the class material to case examples including presentation of results
- Require in-class team projects as well as assignments

Course Schedule

Class	Module	Date	On-site Required	Lecture Topics
1	1	10-Sep-18	√	Course Introduction, Overview of Health Info Technology and EHRs
2	1	17-Sep-18 (Online Only)		Healthcare Workflow and Business Process Re-engineering
3	2	24-Sep-18		Federal Government EHR regulations - Meaningful Use & Advancing Care Information
4	2	1-Oct-18		EHR Functionality and Federal EHR Certification
5	2	9-Oct-2018 (Tuesday for Columbus Day)		EHR Technical Infrastructure Design
6	3	15-Oct-18 (Likely Online Only)		EHR Security & HIPPA
7	3	22-Oct-18	√	EHR Technical Infrastructure Performance Requirements
8	4	29-Oct-19		Interoperability - Health Information Exchanges
9	4	5-Nov-18	√	Interoperability - Standards
10	4	12-Nov-18		EHR Deployment Project Management
11	5	19-Nov-18		EHR System Selection
12	5	26-Nov-18		EHR Deployment Project Budgets
13	6	3-Dec-18		Hospital Information Systems & Population Health
14	6	10-Dec-18	√	mHealth, Course Project Presentations, Course Review
		17-Dec-18	√	Final Exam (Exam period is Dec 16 to 21)

Course Resources

Required Textbook



Health IT and EHRs Principles and Practice
Sixth Edition 2017
by Margret K. Amatayakul
ISBN 9781584265290
Published by:
American Health Information Management Association
233 No. Michigan Ave., 21st Floor
Chicago, IL 60601
www.ahima.org

This textbook can be purchased from Barnes and Noble at Boston University and online sources.

Online Materials
The course makes extensive use of online reading material and the online BlackBoard course website. The website provides extensive course material and will be used to submit materials. URLs will be provided for other readings.

Personal Computers & PC Software
The course uses online materials and software. In addition quizzes will be done online as part of the class' homework using the course Blackboard site (see below). To facilitate in-class exercises, you should bring a computer to all classes. If that is a problem, please let me know as soon as possible.

Assignments will need to be completed using Microsoft Office tools - Word, Excel, and PowerPoint. You will also need access to workflow diagramming software such as Microsoft Visio or Microsoft PowerPoint and to a project management software tool such as Microsoft Project. If you do not have Microsoft Project, please use Gantt Project Tool at http://www.ganttproject.biz. Here is a CNET review of the product: http://download.cnet.com/GanttProject/3000-2076_4-10616093.html#userreview.

MSDN Academic Alliance Software Center

BU MET College is a member of Microsoft Dreamspark for Academic Institutions, which allows faculty, graduate and undergraduate students currently enrolled in MET courses to obtain certain Microsoft products free of charge. This includes MS Visio and MS Project should you choose to use them. Information on Dreamspark is at: http://www.bu.edu/metit/hw-and-sw/msdn-academic-alliance-software-center/.

Instructor

Michael Levinger is an adjunct faculty member of Boston University's MET College. He created CS581 and has been teaching the course for the past several years. Michael is an information technology and healthcare IT senior executive and multi-time entrepreneur specializing in the successful creation, deployment and use of mission-critical software including Electronic Health Records and Health Information Technology. Mike is the Chief Operating Officer of Primaris Healthcare Business Solutions, a consulting and services company specializing in improving healthcare quality including through the use of healthcare information systems like electronic health records. Mike is an advisor to the University of Missouri Medical School Healthcare Management and Informatics Department and an active member of several healthcare industry organizations. Previously, Mike was President and CEO of a Massachusetts-based electronic health record consulting and systems integration company. Under Mike's leadership, the company helped numerous physician practices and healthcare delivery organizations implement EHR deployment programs.

Communication

- Methods
  - Email
  - BU Blackboard course site
- Mike Levinger
  - mlevinge@bu.edu
  - Cell Number: 781-307-7898
  - Skype: mlevinger
- Snow/Weather Cancellation – BU Snow Cancellation Phone Number: 617-353-SNOW

Course Structure & Student Expectations

The course is organized by classroom sessions. Each class focuses on a particular major course topic and consists of a mix of lectures, discussion, class exercises and graded quizzes. Each of the classes requires includes assigned textbook readings; assigned readings from government and healthcare articles and websites; and homework assignments.

What is expected of students?

- Participate
- Work as part of a team
- Think and create solutions
- Reading
    - Textbook chapters
    - Current articles from healthcare and healthcare IT Literature
- Homework projects - critical elements of EHR system deployment
- Class discussions and projects
- Quizzes
- Final exam

1. Attendance

   In person attendance at all classes is expected for in-class students. Attendance will be taken early on in the class. In accordance with the department policy, any student missing more than 2 classes will be considered to have withdrawn. Students arriving late will be considered to have missed the class. If you cannot attend in person please let the instructor know and if possible attend virtually like the blended students.

   Blended students are encouraged to attend as many classes in person as possible. Attendance for blended students is expected at the following classes:

   - 10-September – First class
   - 22 October – Infrastructure class exercise
   - 5-November – Infrastructure requirements homework presentations
   - 10-December – Term project presentations
   - 17-December - Final Exam

   If you have a conflict being onsite these days, please contact me as soon as possible.

2. Timely Presentation of Materials Due & Requests for Extensions

   All homework have due dates and must be completed. Students should organize their time and work so as to turn in assignments by the due date.

   The general position is that extensions or make-up tests are not given. If, for any reason, you are unable to meet any assignment deadline, a student should contact the instructor or a facilitator/teaching assistant immediately and preferably in advance. Homework grades will be reduced for late materials as indicated under Grading. Recognizing that most CS581 students have full-time professional roles and unforeseen situations occur, each student will be allowed one “pass” per term for a one-week delay in submitting homework without a grade reduction.

This policy is not to penalize any individual student. The course materials build from week to week so keeping current is important to successfully learning the material. In addition this policy is an attempt to assure that there is a level playing field and the total class feels confident that no one has a unique advantage.

3. Student Preparation & Class Participation

Minimal preparation is reading the material, and being able to summarize what it is about, what the major issues are, and some recommendations.

Superior preparation involves being able to (i) summarize the situation or problem presented by the material; (ii) recommend solutions; (iii) support your recommendation with data, relevant details, and analyses; and (iv) discuss innovative solutions., or why obvious solutions might be discounted.

4. Off-Syllabus Work

The course topic is part of a very dynamic industry. As such, there is much material that is not covered in the class. Students are encouraged to read and consider related material and issues that are beyond those defined in the syllabus to include in their work and in class discussions.

Grading Policy

All students are expected to demonstrate an understanding of the class materials. To obtain an exceptional grade you have to exceed expectations in your assignments, quizzes, final exam and discussions.

Grade Weighting

There are multiple graded items (classroom discussions and exercises, five assignments, five quizzes and a final exam). Course letter grades are determined in a three-phase process designed to accurately determine how well each student has demonstrated that they understand and can use the subject matter. The process begins when the professor and any facilitators/teaching assistants compute the weighted scores, using the weighting below. They examine not only the overall weighted score, but also each student's scores in each of the areas, and the trend of scores in each of these areas. The professor in conjunction with the facilitators/teaching assistants then determines a letter grade for each student. If there are teaching assistants or facilitators, the professor then sends a spreadsheet containing all graded items for all students, and the proposed letter grades, to them, requesting final review and comment. After the professor receives feedback from the facilitators/teaching assistants he finalizes the grades and uploads them to the University Information System, where students can see their grades via the Student Link.

All graded items are graded as a percentage of the maximum anticipated score; this traditional American grading system is sometimes termed "out of 100." Rarely a student may so exceed our expectations that they earn more than 100.

Grading Structure and Distribution

The following table summarizes the four kinds of graded items and the default percentage of grades determined by each of these kinds of graded items. Each of these graded items is explained below.

Overall Grading Percentages	
Assignments	25%
Course Term Project	10%
Class Discussions & Exercises	20%
Quizzes	20%
Final Exam	25%

Assignments & Term Project

The course has five homework assignments plus a final project. Each homework assignment is an exercise doing an important part of deploying an EHR. The final project is to develop and present an integrated EHR deployment plan. It builds on the five previous homework assignments. The term project will be done as a group project with groups selected by the professor from the class. Students will do the homework assignments individually and then work with their project team to integrate their work and develop the final plan. Most group work will be done during class though groups are welcome to collaborate on the final project outside of class.

Assignments are due on the class date indicated. The professor and facilitators/teaching assistants endeavor to return graded materials one week later at the next class.

If for any reason you are unable to meet any assignment deadline, contact the professor or a facilitator/teaching assistant as soon as possible and preferably in advance. As stated earlier, recognizing that most CS581 students have full-time professional roles and that unforeseen situations occur, each student will be allowed one “pass” per term for a one-week delay in submitting homework without a grade reduction. Any other extensions must have mitigating

circumstances. Scores for assignments submitted late without extenuating circumstances will be penalized ten percent. Assignments submitted late near the end of the term may not be graded, because facilitators/teaching assistants and the professor are very busy grading final exams, resulting in zero scores for those assignments

If you are stuck, and just can't complete part of an assignment, then submit what you can complete, asking for help. The professor or facilitator/teaching assistant may then choose to provide you with guidance in the areas where you are stuck, and return the partial assignment to you for further work and resubmission. We will deduct from your score on the resubmission for any portion of the solution that was provided to help you. We may re-grade based on resubmissions. Whether a particular resubmission should be re-graded is up to the judgment of the professor or facilitator/teaching assistant. Resubmissions may not be graded near the end of the term. Resubmissions are intended to help struggling students who are stuck, and resubmissions are not intended for routine use.

Class Discussions and Class Contributions

Twenty percent of your grade is based on your class contributions. This grade is derived from your participation in classroom discussions, exercises, group projects and your presentation of both homework materials and other topics. This is an important part of the learning process. Your classroom participation grade is based on your involvement and mastery of the material and how well you work as a member of a team and contribute to your classmates' learning experience and understanding of the material.

To facilitate class discussions, all students participating virtually via Adobe Connect are required to have a headset (or a microphone and earbuds or speakers) so they can participate verbally in the discussions. Good headsets can be purchased for under $15. Remote students are encouraged to also have a camera so they can participate visually as well. This is especially valuable when participating in group work.

Quizzes

There are five graded quizzes. Quizzes consist of a combination of choose multiple, multiple choice, true/false, matching and short written answer questions. Quizzes are taken online on your own time using the course Blackboard site. They will be available for approximately one week up to the due date to complete the quiz. Students will have one opportunity to take the quiz at a time of their choosing during that week. The results for your quiz will be released as soon as possible after the quiz due date. When the quiz results are released, you will be able to see the questions and your answers. Since students have a week to take quizzes, they should be completed by the due date. Quizzes may be taken after the results have been released, with

the professor's or a facilitator/teaching assistant's permission. Grade deductions for late quizzes are at the discretion of the professor depending on the reason for a delay.

Final Exam

The final exam consists of a combination of choose multiple, multiple choice, true/false, matching and short written answer questions. The format of the questions is very similar to those in the quizzes. You will have three (3) hours to complete the final exam which has shown to be plenty of time. Per BU MET policy, for classroom and blended courses, the final exam must be taken in person at the scheduled time unless there are extenuating circumstances. If you have extenuating circumstances, please contact the professor as soon as possible

Grading Structure

- Homework Assignments
  - Each homework assignment and the final project have a set of "learning topics" with a weighting for each topic. Each topic will be scored on a zero to 100% basis and a grade for the homework will be determined based on the weighted average.
  - Homework should be turned on time
  - 10% point reduction for each week that homework is late
  - One "pass" for no deduction for a one week delay
- Quizzes
  - Choose multiple, multiple choice, true/false, and matching questions will be graded based on getting the correct answer. No deductions will be taken for wrong answers.
  - Each question requiring a written answer will have a set of "learning topics" being tested for with a weighting for each topic. Each topic will be scored on a zero to 100% basis and a grade for the written answer will be determined based on the weighted average.
  - Quizzes should be completed during the week they are available online up to the quiz deadline.
- Final Exam
  - Choose multiple, multiple choice, true/false, and matching questions will be graded based on getting the correct answer. No deductions will be taken for wrong answers.
  - Each question requiring a written answer will have a set of "learning topics" being tested for with a weighting for each topic. Each topic will be scored on a zero to 100% basis and a grade for the written answer will be determined based on the weighted average.
  - Final exam questions will also have a weighting factor since some written questions are longer and more in-depth than others.
- Class exercises, group projects and discussion
  - Will be graded qualitatively

Your assignments, discussions, quizzes, and final exam will be graded on a percentage basis. The following table summarizes typical correspondence of percentage and letter grades for individual graded items. The process and criteria for determining course letter grades is more complex than computing the weighted average grade and looking up the letter grade in the table below.

Letter Grade	Approximate Percentage Grade Range	Criteria
A	95–100	The student's work is excellent and nearly without defect. The work demonstrates mastery of the material.
A-	90 < 95	The student's work is excellent with some minor defects. The work demonstrates a solid grasp of the material.
B+	85 < 90	The student's work is good with a few defects. The work demonstrates a solid grasp of most but not all of the material.
B	80 < 85	The student's work is above average with some defects. The work demonstrates a solid grasp of some aspects of the material.
B-	75 < 80	The student's work is approaching average. The work demonstrates a grasp and understanding of some aspects of the material.
C+	70 < 75	The student's work is average and has some moderate defects. The work demonstrates a minimal grasp and understanding of the material.
C	65 < 70	The student's work is average and has some major defects. The work demonstrates a basic understanding of the material but nothing more.
C-	60 < 65	The student's work is below average and has some major defects. The work demonstrates a barebones understanding of the material but nothing more.
D	55 < 60	The student's work is poor. Sections may be missing from the work. The work does not demonstrate an understanding of the material at even a basic level.
F	< 55	The student's work is unacceptable. Sections may be missing from the work. The work does not demonstrate an understanding of the material in any fashion.

Note that you must earn a cumulative grade point average of at least 3.0 (B) to be in good academic standing. For more information, see the MET Computer Science Academic Policies Online Manual.

The percentage ranges above are approximate. Your letter grade is determined by your professor as the best overall measure of how well you have demonstrated that you understand the material, taking into separate consideration your performance in the quizzes, assignments, classroom discussions, classroom exercises, and final exam. Additional grading criteria include any substantial difference in your performance on the final exam and the general trend of your scores over the term. The actual grade ranges will be adjusted to reflect the difficulty of graded items. While there is no fixed absolute number of grades in any one level it is important to note that high grades reflect an excellence in the understanding of class material and organization of thought. In addition, an important aspect of any class is the shared thoughts and insights of the class members. Grades will also reflect an individual's contributions to the class.