ISQA 551: Information Technology for Healthcare  
Course Syllabus  
Fall 2014  
4 credit hours  
Faculty: Vishnu Mohan MD MBI MBCS FACP

COURSE DESCRIPTION

Today’s health care is driven by technology. Information technology in technology is often complex and diverse. Some aspects of health care IT are generalizable to any business setting, while others are specific to the health care arena. In this course, students will focus on the use of information technology in health care settings. The course assists managers in health care organizations understand the importance, utility, application, and future directions in HIT.

Medical informatics is the field concerned with the acquisition, use, and storage of information in health care, medical research, and public health. This course is intended as a broad, high-level survey of the field, and covers the main applications of information technology in health care, including medical computing, computer networks, software and social aspects of health care computing, electronic health records, personal health records, standards and interoperability, clinical decision support, information retrieval, genomics, imaging, and telemedicine.

The course is structured to offer viewpoints of information technology from multiple domains, including medicine, computer science, nursing, and public health. The perspectives of clinicians, technologists, and patients are considered.

The course also discusses current driving forces in health care IT that are important from a manager’s perspective, including meaningful use criteria that apply to electronic health records, as legislated by the Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA).

Instructor:

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503-494-4469

How to reach me: Email is always the best way to communicate with me. My office hours are by appointment – email for a time to meet virtually or face-to-face, or leave a message at 503 494 4469.

Teaching: I teach three core clinical informatics courses at OHSU at the masters and PhD level - BMI 560/660 Design and Evaluation in Health Informatics, BMI 512/612 Clinical Information Systems, and BMI 513 Electronic Health Record Lab. Additionally, I co-teach ISQA 511 (managerial
Decision Making) with Karen Eden for the MBA program. As an internist and clinician-educator, I also teach residents and medical students.

**Research interests:** My primary research interest is in clinical diagnostic reasoning, and how clinicians interact with technology such as clinical decision support and computerized physician order entry (CPOE). We study this interaction in a unique way, using a qualitative, interdisciplinary approach. I’m also interested in using high-fidelity simulation to look at how clinicians interact with technology, in clinical and biomedical informatics education, and in developing curriculum for the health IT workforce.

**Homepage:** My OHSU web page is at: [http://goo.gl/3C1D](http://goo.gl/3C1D)

**PRIMARY COURSE OBJECTIVE**

This course answers the question: "What should a manager in a healthcare organization know about health IT in order to be an effective manager and to use IT to drive change?"

**LEARNING OBJECTIVES**

1. **Student learning objectives related to basic computing:**
   a. Identify the basic tenets of biomedical computing to be able to inform optimal selection of hardware, software, and network connections for a given health or biomedical setting.
   b. Describe the major aspects of software engineering as they relate to health care
   c. Be able to specify a biomedical computing use case for an individual health care IT functionality

2. **Student learning objectives related to EHRs and PHRs:**
   a. Identify the essential functions of the electronic health record (EHR)
   b. Describe the major barriers to EHR use
   c. Define the personal health record (PHR) and describe its usage, content, and value

3. **Student learning objectives related to meaningful use criteria:**
   a. Understand the major threats to patient safety and causes of medical error
   b. Explain the basic principles of healthcare quality and how the EHR enables them
   c. Distinguish the different types of clinical decision support and describe their use and limitations in clinical practice
   d. Explain the process of computerized provider order entry and challenges to its use
   e. Understand the goals of health information exchange and how they are carried out
   f. Apply the meaningful use criteria under the HITECH/ARRA legislation
4. **Student learning objectives related to EHR implementation and evaluation:**
   a. Understand the analysis of workflow for EHR implementation
   b. Describe the major steps and challenges in EHR implementation
   c. Discuss costs and benefits of EHR implementation
   d. Discuss the implications of the major studies on use and clinical outcomes
   e. Discuss the role of EHR and other clinical data in clinical and translational research

5. **Student learning objectives related to organizational behavior and healthcare IT management:**
   a. Understand the role of organizational behavior and other issues in implementing health IT systems
   b. Be able to apply the principles of change management in leading implementation of health IT interventions

6. **Student learning objectives related to imaging and telemedicine:**
   a. Describe the management of images in clinical settings, including the use of PACS systems
   b. Understand the different modalities of imaging and their capture and use in digital form
   c. Classify the different types of telemedicine and discuss their uses
   d. Describe the efficacy of telemedicine as shown in clinical studies
   e. Discuss the different approaches to patient-clinician communications

7. **Student learning objectives related to genomics and personalized medicine:**
   a. Understand the role of genetics and genomics in biology and medicine
   b. Discuss the major techniques of bioinformatics, including emerging approaches in gene expression, gene variation, and their association with the phenotype
   c. Describe the concept of personalized medicine and how it is enabled by biomedical and health informatics

8. **Student learning objectives related to standards and interoperability, privacy, confidentiality and security:**
   a. Explain the importance of standards and interoperability for health and biomedical data and information systems
   b. Understand the major issues related to identifier standards, including the debate on patient identifiers
   c. Discuss the different terminology systems used in biomedicine and their origins, content, and limitations
   d. Differentiate the definitions of privacy, confidentiality, and security
   e. Describe the elements of HIPAA and other privacy and security issues in health care

*Secondary learning objectives may be instituted or modified at the instructor's discretion during the course.*
REQUIRED TEXTBOOK

None, but students without a healthcare background are strongly encouraged to review an introductory text. Instructions will be provided during the course for those students who use the text. **Please inform me as soon as possible if you plan to do so.**

The recommended introductory text is:


COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Theme</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>The basics of medical computing</td>
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<tr>
<td>Week 2</td>
<td>Quality &amp; Patient Safety</td>
</tr>
<tr>
<td>Week 3</td>
<td>Electronic and Personal Health Records (EHR, PHR)</td>
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<tr>
<td>Week 4</td>
<td>HIEs &amp; Meaningful Use of the EHR</td>
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<tr>
<td>Week 5</td>
<td>EHR Implementation and evaluation</td>
</tr>
<tr>
<td>Week 6</td>
<td>Organizational Behavior &amp; Management Issues in Healthcare IT</td>
</tr>
<tr>
<td>Week 7</td>
<td>Translational Bioinformatics &amp; Personalized Medicine</td>
</tr>
<tr>
<td>Week 8</td>
<td>Imaging &amp; Telemedicine</td>
</tr>
<tr>
<td>Week 9</td>
<td>Privacy, Confidentiality, &amp; Security</td>
</tr>
<tr>
<td>Week 10</td>
<td>Standards &amp; Interoperability</td>
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<tr>
<td>Week 11</td>
<td>Debriefing and Test</td>
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Note: The course schedule may be modified; students will receive notice of any changes in the schedule. The course schedule on the Sakai course site is the most up-to-date version.

COURSE COORDINATION

The course is primarily conducted online, and is available through the Sakai learning management software at [http://sakai.ohsu.edu](http://sakai.ohsu.edu). The online component includes online lectures delivered using the Flash format, PowerPoint slides and handouts, reading assignments, and additional project material. Students participate in discussions using the Sakai Forums tool, and take tests that are administered on Sakai. Additionally, there are also two face-to-face sessions that occur at the OHSU Marquam Hill campus.
EVALUATION AND GRADING

Group projects (Group assessment) = 40% of final grade
Online participation (Individual assessment) = 40% of final grade
Exam (Individual assessment) = 20% of final grade

EXPECTATIONS

Students are expected to:

1. View lectures posted on Sakai in a timely fashion.

2. Review reading assignments; including articles or handouts, and independent learning material. Students are responsible for learning all content in the assigned readings, whether discussed in the lectures or not.

3. Participate in group activities such as projects in a cooperative fashion with other members of their assigned team.

4. Participate in class discussions; this class actively encourages engagement and participation by all students.

5. Complete assignments and deliverables in a timely fashion; work is assigned most weeks.

6. Attend and participate in face-to-face sessions; two sessions have been scheduled for this course.

7. Complete tests, including a final exam that is available to students in the last week of class. The final exam will be a closed-book, timed effort, and questions will be in a multiple-choice format.

HOW TO SUCCEED IN THIS COURSE

General
Health care has become a highly specialized environment, and managers are often expected to possess some knowledge of the clinical and technological environment they work in. The primary objective of this course is to provide the level of technology-related knowledge that will allow managers in health care organizations to function effectively. The material presented in this course is necessary to the health care manager since it provides the appropriate context for making good decisions. However, the content is complex, and I do believe that this is one of the more difficult courses in the program, especially for those who do not particularly like technology.
At the graduate level, I anticipate that students will be adult learners and already have significant insight into the way they learn best. This section describes one approach that may be helpful in allowing you to be successful in this course.

My philosophy on learning and the role of the instructor
The best learning occurs when we learn from each other. All of you bring your unique experiences and prior learning to this course. I encourage you to share your expertise during this course. My classes emphasize a culture where participation and sharing information results in the dissemination of knowledge and wisdom.

When I teach a course at the graduate level, I often find that I learn as much from you as you do from your instructors. I see my role as primarily that of a facilitator, helping you to reach your learning goals for the course.

Team group activities
While managers need to be effective leaders, they also need to be excellent team players. This course has a significant level of team participation. You will be assigned to a team for many of the deliverables for this course, and one grade will be given to each team when these deliverables are evaluated. This means that every member of the team will get the same grade for that particular deliverable.

At the MBA level, I expect each team to be collaborative and the members to contribute equally to team activities. I encourage you to work with your team in an effective and productive fashion in order to maximize your group grades. You do not want to be the one member who pulls down the entire team's score!

Participation in Forums
Participation scores are graded weekly, so read and post on the Forum regularly! The weekly score is based on your level of contribution to the learning of others. I'm looking for quality, not quantity! It's not how much you post, but *what* you say and *how* you say it.

Remember that a Forum format is just that – a place for meaningful discussion. Responses to posts often are as useful to enhance learning as the original post itself. The Forum is a great format to help us learn from each other.
Lectures and course materials
This course offers an intensive amount of information and it is highly recommended that students develop their own routine schedule to keep up with course materials; it is likely that students will not be able to catch up if they miss a substantial number of lectures over the duration of the course.

GRADING
This is a graduate level offering, and though I wish every one of you could score a perfect "A" for this course, in all likelihood that particular scenario will remain a fantasy.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>95-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90-94%</td>
</tr>
<tr>
<td>B+</td>
<td>87-89%</td>
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<tr>
<td>B</td>
<td>83-86%</td>
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<tr>
<td>B-</td>
<td>80-82%</td>
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<tr>
<td>C+</td>
<td>77-79%</td>
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<tr>
<td>C</td>
<td>73-76%</td>
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<tr>
<td>C-</td>
<td>70-72%</td>
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<tr>
<td>D+</td>
<td>67-69%</td>
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<tr>
<td>D</td>
<td>63-66%</td>
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<tr>
<td>D-</td>
<td>60-62%</td>
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<tr>
<td>F</td>
<td>Below 60%</td>
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</tbody>
</table>

Graduate credit will be granted for a class grade of C or better, however a class grade below B is cause for serious concern.

I do follow this broad grade model, but at the end of the course I also look to see where the natural breaks occur in clusters of final raw student scores to determine where the line is drawn for the + and - grades at each letter level.

You will see that each evaluation aspect of this course has approximately equal weightage. This is to ensure that no one specific element can drag down your grade. However students who show an equal level of engagement in all aspects (assignments and group deliverables, group projects, online and in-class participation) tend to have the highest grades in the course. Of course, this also implies that students who choose not to actively participate in one or more aspects of this course will find it difficult to earn a high grade.

You will note that there is a multiple choice test that is part of the evaluation matrix for this course. I need to know that you have understood the key elements of the course content that will allow you to function as successful managers after completing your MBA, and the test allows me to quantitatively evaluate if specific objectives have been met. In addition to giving you feedback of your own learning, it also helps me improve the course for future offerings by targeting areas that need a greater focus.

Grades are due to the Registrar's Office one week after the end of the term. Students will find official grades posted in ISIS within two weeks of the completion of the term. If at this time you do not see your grades in ISIS, please contact the Division at 503-346-0375.
ACADEMIC HONESTY

Course participants are expected to maintain academic honesty in their course work. Participants should refrain from seeking published solutions to any assignments. Literature and resources (including Internet resources) employed in fulfilling assignments must be cited. Turnitin software may be used at the discretion of the course instructor.

See http://ozone.ohsu.edu/som/faculty/docs/graduatecouncil/profconductpolicy.pdf for details.

In an effort to uphold the principles and practice of academic honesty, faculty members at OHSU may use originality checking systems such as Turnitin at their discretion to compare a student’s submitted work against multiple sources.

STUDENT ACCESS

Our program is committed to all students achieving their potential. If you have a disability or think you may have a disability (physical, learning, hearing, vision, psychological) which may need a reasonable accommodation please contact Student Access at (503) 494-0082 or e-mail at studentaccess@ohsu.edu to discuss your needs.

You can also find more information here. Because accommodations can take time to implement, it is important to have this discussion as soon as possible. All information regarding a student’s disability is kept in accordance with relevant state and federal laws.

USE OF SAKAI

This course will have an online component, which can be accessed through Sakai, OHSU’s online course management system. For any technical questions or if you need help logging in, please contact the Sakai Help Desk.

Hours:
Sakai Help Desk
Mon – Fri, 8 am – 10 pm
weekends 12 pm – 5 pm

Contact Information:
(Local) 503-494-7074,
(Toll-free) 877-972-5249
email sakai@ohsu.edu

Please remember, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time.
COPYRIGHT INFORMATION
Every reasonable effort has been made to protect the copyright requirements of materials used in this course. Class participants are warned not to copy, audio, or videotape in violation of copyright laws. Journal articles will be kept on reserve at the library or online for student access. Copyright law does allow for making one personal copy of each article from the original article. This limit also applies to electronic sources.

To comply with the fair use doctrine of the US copyright law, Sakai course sites close three weeks after grades are posted with the Registrar. Please be sure to download all course material you wish to keep before this time.

SYLLABUS CHANGES & RETENTION
This syllabus is not to be considered a contract between the student and the School of Medicine. It is recognized that changes may be made as the need arises. Students are responsible for keeping a copy of the course syllabus for their records. HOWEVER PLEASE NOTE: the course outline posted on Sakai will have the most up to date information.