3 credit hours
Winter Term 2017

Instructor: Vishnu Mohan MD MBI FACP

Version information: This version of the syllabus updated November 30, 2016

Key information about this course:

Do I need to complete any prerequisites before I enroll in this course?

<table>
<thead>
<tr>
<th>Course Number</th>
<th>BMI 513</th>
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<tbody>
<tr>
<td>Course Title</td>
<td>Electronic health records lab course</td>
</tr>
<tr>
<td>Number of Credits</td>
<td>3</td>
</tr>
<tr>
<td>Quarter</td>
<td>Winter Term 2017</td>
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<td>Instructors (with e-mail addresses)</td>
<td>Vishnu Mohan MD MBI FACP <a href="mailto:mohanv@ohsu.edu">mohanv@ohsu.edu</a> 503-494-4469</td>
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While there is no formal prerequisite for this course, it is recommended that you successfully complete BMI 512 (Clinical Information Systems) before enrolling in BMI 513, or take BMI 512 concurrently with this course if both courses are offered the same term.

Additionally, since you will need to install and work with software this term, it is strongly recommended that you have basic computer skills.

While not mandatory, it would be very helpful for you to complete an introduction to healthcare course (such as BMI 530) if you are not a clinician.

What is this course about?
BMI 513 is designed to introduce you to an electronic health record, and to familiarize you with the clinical informatics operating environment. This is a practical, lab oriented course, and will allow you to understand the complex interactions and features that make up a modern clinical information system.

This course examines the use of the EHR in both inpatient and outpatient clinical environments, and focuses on specific elements of the EHR including order set development, customization, clinical decision support, ancillary services such as the clinical laboratory and radiology, and billing and coding functionality. The course also explores analytics and system security from the perspective of EHR customization.

This is an introduction-level course, designed to offer the most benefit to those who do not have prior exposure to EHRs. If you have previous experience with an EHR, this course exposes you to two different EHR systems and offers insight into EHR functionality.

Students will have hands-on access to two EHRs in this course - Epic (Epic Systems Corp, Verona, WI) and SpringCharts (Spring Medical Systems, Houston, TX)

**This course is primarily intended for students who do not have any significant formal experience with EHRs. If you have extensive prior exposure to EHRs, you may want to contact the instructor prior to registering to see if this course best meets your learning goals.**

**Also, if you have no prior exposure to the healthcare environment of care, you may want to contact your instructor prior to registering.**

**Is this a required course?**

No, BMI 513 is not a required course for either the graduate certificate or the masters’ program.

**What are the primary learning objectives of this course?**

This course will enable you to:

1. Engage in "hands on" learning in an environment that closely simulates a real-world clinical informatics setting

2. Interact with an EHR in a manner that improves their understanding of system functionality

3. Understand from a practical perspective how EHRs are organized and configured

4. Understand EHR functionality in the context of clinical workflows and processes
Is there a required textbook?

Yes, the textbook for the course is:

Title: Electronic Health Records  
Author: Byron Hamilton  
Publisher: McGraw Hill  
Edition: 3 edition (July 2012)  
Language: English  
ISBN-10: 0073402141

Note that purchasing the textbook also grants you access to SpringCharts.

Who teaches this course?

Vishnu Mohan MD MBI FACP

About me: I am an internist, clinical educator, and clinical informatician, and an Assistant Professor in Medical Informatics, Medicine, and Management here at OHSU. I am the program director of our ACGME-accredited clinical informatics subspecialty fellowship, and am board certified in internal medicine and in the subspecialty of clinical informatics.

Teaching: I teach three core clinical informatics courses at DMICE - BMI 560/660 (Design and Evaluation in Health Informatics), BMI 512/612 (Clinical Information Systems), and BMI 513 (Electronic Health Record Lab). I also teach ISQA 551 (Healthcare Information Technology for Managers for the PHSU/PSU MBA in Healthcare Management program. As an internist and clinician-educator, I also teach residents and medical students.

Research interests: My primary research interest is in ensuring patient safety in the delivery of healthcare, and in promoting clinical diagnostic reasoning in today's technology-rich clinical environment. I study how clinicians interact with technology, and how technology affects their decision making. I’m also interested in using high-fidelity simulations to examine how clinicians interact with technology. I have been involved with developing protocols that promote EHR safe use.

Other interests: I am also interested in clinical and biomedical informatics education, as well as curriculum development that helps to train the health IT workforce.

Homepage: My OHSU web page is at: http://goo.gl/3C1D

Address: BICC 409
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.

How is this course coordinated?

This class is available to online students.

You will learn through the Sakai learning management software at https://sakai.ohsu.edu. The online component includes lectures, PowerPoint slides and handouts, reading assignments, and project material. For any technical questions or if you need help logging in, please contact the Sakai Help Desk.

Hours: Sakai Help Desk is available Mon – Fri, 8 am – 10 pm and weekends and holidays 12 pm – 5 pm
Contact Information:
(Local) 503-494-7074 (4-7074 on campus)
(Toll-free) 877-972-5249
(Web) http://atech.ohsu.edu/help
(Email) sakai@ohsu.edu

You will also need administrative access to a computer, since you will be downloading and installing programs and files during this course. If you are unsure of the level of your computer skills, please contact the instructor first before registering!

How is the course structured?

The course is structured in a modular fashion as a series of weekly components. Each weekly module includes:

1. A lecture, that defines specific informatics concepts associated with the module’s designated lab activity, and discusses theoretical concepts in the context of clinical
informatics. The emphasis of this course is on performing the hands-on lab activities rather than depending on lectures for learning.

2. Reading material with emphasis on case studies and clinical settings

3. Lab activities with specific (often step-by-step) instructions

4. Discussion questions highlighting specific learning objectives

5. A quiz.

Example of the course schedule and topics covered (note that the actual schedule for this course may vary from the example):

<table>
<thead>
<tr>
<th>Week</th>
<th>Material</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Course introduction and setup</td>
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<td>Week 2</td>
<td>Administrative functions</td>
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<td>Week 3</td>
<td>Patient charting</td>
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<td>Week 4</td>
<td>Workflows</td>
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<td>Week 5</td>
<td>Clinical and billing tools</td>
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<td>Week 6</td>
<td>Building order sets</td>
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<tr>
<td>Week 7</td>
<td>Building and customizing templates</td>
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<td>Week 8</td>
<td>Clinical decision support</td>
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<td>Week 9</td>
<td>Tests, procedures, productivity and reporting part 1</td>
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<tr>
<td>Week 10</td>
<td>Reporting part 2 and Meaningful Use</td>
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<tr>
<td>Week 11</td>
<td>Putting it all together</td>
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What kind of activities will I be engaging in during this course?

Some of the activities that you will complete during this course (note that actual course content may vary from these examples, since content is continually and incrementally modified for this course):

- Log into and navigate the EHR in different clinical roles
- Add a patient to an provider schedule
- Create messages that allow members of an interprofessional clinical team to communicate
- Modify schedules
- Track patients in an outpatient clinical setting
• Create an modify color coding that displays patient status in the clinic
• Create and archive patient census data
• Build a patient face sheet
• Add insurance information to patient records in the EHR
• Add allergies to the patient record
• Engage in clinical documentation, including SOAP notes
• Create a test report in the patient’s chart
• Follow clinical workflows and engage in appropriate documentation
• Create a routing slip
• Generate clinical reports
• Define and conduct a chart evaluation
• Build and generate a superbill
• Add a care plan to the patient’s chart
• Create and use templates and macros
• Order tests, medications, and referrals
• Utilize specific CPOE and CDS features of the EHR
• Create and use order sets
• Build and alerts and reminders
• Configure and use knowledge-based CDS tools
• Link procedure and diagnostic codes to specific orders
• Generate clinical reports in the context of Meaningful Use. Note: This course is NOT intended to be an analytics or formal data mining learning experience.

How is the course graded?

Grading weights for evaluation:

Lab exercises = 70%
Tests = 10%
Discussion = 20%

How will I be graded for participation online?

Each week, you will be required to participate in the Forums on Sakai. Discussions will typically center around a topic chosen by your instructor.

Forums participation is graded using the following rubric:

0 = no participation
1 = minimal participation
2 = adequate participation in discussion (students posts satisfy the requirements)
3 = student post demonstrates that they have met learning objectives
4 and 5 = superior participation that exceeds the required response (participation in a meaningful manner that promotes the learning of others)
You will see that there is a significant weightage towards participation that allows others to learn from your perspectives.

**What are the assignments I will have to complete during this course?**

**Labs**

The core activity of this course is the lab. Each week there will be a series of exercises that you will have to complete using the EHRs associated with this course. While each lab activity is accompanied by instructions, and assistance is available, one of the prime objectives of this course is to give you the opportunity to “play” with an EHR in a sandbox environment, and I encourage you to explore the features of the EHR to the best of your ability.

Here is a sample of some of the lab activities that have previously been featured in the course, to give you an idea of what level of labs you are letting yourself in for. Note that the labs you may encounter may vary from the samples below, because the course is continuously and iteratively improved based on feedback from students who have taken prior offerings as well as clinical informatics subject matter experts.

- In this exercise, you will create a routing slip, which is a document that contains details for billing an encounter. This is also your introduction to the E&M coder, a tool that recommends an appropriate level of billing.

- This exercise introduces you to the concept of a superbill. In this activity you will edit the superbill form under administrative functions, adding E&M codes and specific supply codes. You’ll then export the form to word processing software.

- Here you will create and administer a patient instruction sheet - providing information to patients is an essential component of clinical care, and also mandated by law in many states as well as a meaningful use criteria.

- You will log on as a nurse, and check demographics, view the problem list, select a new problem (diabetes), enter some vital signs, update allergies, add an additional problem (hypertension), and update medications.

- You will log on as the physician, and access the same chart as the previous exercise. Note how the nurse's entries are visible to the physician. You will then review a clinical note, add your own note using a template, sign the note, add medications, and order a lab test or two. You'll note that the workflow determines the type of screens used and their sequence.

- This exercise lets you add a new diagnosis to a patient record. Adding appropriate diagnoses isn't just important to keep the diagnosis current, but diagnoses are also often linked to labs and procedures for billing.

- In this exercise, you will add a new medication to the patient's list. This is an activity that might be done by many different clinicians - physicians, nurses, medical assistants, etc.

- In this exercise, you will place both medication and non-medication orders to demonstrate CPOE functionality of the EHR.

- In this exercise you will create an excuse note for the patient. This is a good representative example of different types of patient documentation that clinicians generate during an office visit.
In this exercise you will create a basic best practice alert: When a patient’s chart is opened, the EHR will check to see whether a patient has an allergy. And if so, suggest an appropriate course of action.

In this exercise you will build a template document that can be used by specific end-users, deploy it into the EHR environment, and then go back as a clinician and use the template you just created in a clinical setting.

Tests

Each week students are required to take a quiz on Sakai. The quiz is designed to reinforce learning concepts of the week, is timed, and is entirely multiple choice.

What am I expected to do in order to successfully complete this course?

To succeed in this course, you are expected to:

1. Review reading assignments; including lectures, chapters from the required textbook, articles or handouts, and independent reading for projects and questions. Students are responsible for learning all content in the assigned readings, whether discussed in the lectures or not.

2. Participate in lab sessions and exercises.

3. Complete lab sessions, exercises, and other assigned work in a timely fashion. Many lab sessions involve prior preparation.

4. Complete quizzes and other evaluative tools during the course in a timely fashion.

What is your philosophy on learning and the role of the instructor?

At this level of education, I anticipate that students will be adult learners and already have significant insight into the way they learn best.

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 reach your learning goals for the course.

**What is the best way to participate 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.

Please read all prior responses before replying to a specific post. This will help grow the conversation and avoid repletion.

Please respect the opinions of others when posting on the Forum.

Please do take the time to frame your posts clearly and concisely, with attention to grammar and punctuation.

**When do I get my grades?**

OHSU is committed to providing grades to students in a timely manner. Course instructors will provide students with information in writing at the beginning of each course that describes the grading policies and procedures including but not limited to evaluation criteria, expected time needed to grade individual student examinations and type of feedback they will provide.

Class grades are due to the Registrar by the Friday following the week of finals. However, on those occasions when a grade has not been submitted by the deadline, the following procedure shall be followed:

1) The Department\(^1\) /Program Coordinator\(^2\) will immediately contact the Instructor requesting the missing grade, with a copy to the Program Director and Registrar.

2) If the grade is still overdue by the end of next week, the Department\(^1\) /Program Coordinator\(^2\) will email the Department Chair directly, with a copy to the Instructor and Program Director requesting resolution of the missing grade.
3) If, after an additional week the grade is still outstanding, the student or Department\(^1\)/Program Coordinator\(^2\) may petition the Office of Graduate students for final resolution.

\(^1\) For courses that are run by a specific department.
\(^2\) For the conjoined courses (course number is preceded by CON_ that are run by Graduate Studies.

**What is DMICEs position on 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. **Please note that Turnitin software may be used at the discretion of the course instructor.**


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

*To protect student privacy in this process, it will be necessary to remove all personal information, i.e. student name, email address, student u-number, or any other personal information, from documents BEFORE submission.*

**What is the DMICE policy regarding discrimination?**

Oregon Health & Science University is committed to creating and fostering a learning and working environment based on open communication and mutual respect. If you encounter sexual harassment, sexual misconduct, sexual assault, or discrimination based on race, color, religion, age, national origin or ancestry, veteran or military status, sex, marital status, pregnancy or parenting status, sexual orientation, gender identity, disability or any other protected status please contact the Affirmative Action and Equal Opportunity Department at 503-494-5148 or aaeo@ohsu.edu. Inquiries about Title IX compliance or sex/gender discrimination and harassment may be directed to the OHSU Title IX Coordinator at 503-494-0258 or titleix@ohsu.edu.
What is OHSU's policy regarding Student Access?

OHSU is committed to providing equal access to qualified students with disabilities. Student Access determines and facilitates reasonable accommodations, including academic adjustments and auxiliary aids, for students with documented disabilities. A qualified student with a disability is a person who meets the academic and technical standards requisite to admission or participation in a particular program of study. As defined by the Americans with Disability Act (ADA), a person with a disability has a physical or mental impairment that substantially limits one or more major life activities of the individual. This may include, but is not limited to, physical conditions, chronic health issues, sensory impairments, mental health conditions, learning disabilities and ADHD. Student Access works with students with disabilities from all of OHSU’s educational programs and at each campus.

Each school has an assigned Program Accommodation Liaison (PAL), who acts as an “in-house” resource for students and faculty concerning access issues for students with disabilities. The PAL works in collaboration with Student Access to implement recommended accommodations for students with disabilities.

It is recommended that you contact Student Access to consult about possible accommodations if you a) received disability accommodations in the past, b) begin experiencing academic difficulties, and/or c) are given a new diagnosis from your healthcare provider.

Learn more about Student Access:
Phone: 503 494-0082
Email: studentaccess@ohsu.edu
Website: www.ohsu.edu/student-access

What restrictions does DMICE have with respect to course access, and why?

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 course materials or take screenshots 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 as you will have no further access to your courses.

What is the DMICE policy regarding communication?
1. If the syllabus directs the student to contact the TA before contacting the instructor, the student should do so. Otherwise, the student should contact the instructor and allow 2 business days (not including weekends) for a response.

2. If the student does not receive a response from the instructor within 2 business days, s/he should contact the TA (if there is one). When contacting the TA s/he should cc the instructor and Diane Doctor at doctord@ohsu.edu.

3. If a student does not receive a response from the TA within 1 business day (not including weekends), s/he should contact Diane Doctor at doctord@ohsu.edu and cc the instructor and the TA.

4. If Diane does not reply within 1 business day (not including weekends), the student should contact Andrea Ilg at ilgan@ohsu.edu.

5. Students having difficulties with Sakai should contact the Sakai Help Desk at sakai@ohsu.edu or at (877) 972-5249. Sakai help is available M-F from 8am to 10pm and weekends from Noon to 5pm. Do not contact the instructor.