BMI 560/660 - Design and Evaluation in Biomedical Informatics

OFFERED ONLINE

3 credit hours
Instructor: Vishnu Mohan MD MBI FACP

Version information: This version of the syllabus updated **December 01, 2014**

Key information about this course

Course Number	BMI 560/660
Course Title	Design and Evaluation in Biomedical Informatics
Number of Credits	3 (online)
Quarter	Winter Term 2015
Instructors (with e-mail addresses)	Vishnu Mohan MD MBI FACP mohanv@ohsu.edu 503-494-4469
Required Textbook	Leedy PD and Ormrod JE, Practical Research: Planning and Design. 10th Edition. Prentice Hall. ISBN-10: 0132693240

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 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), and co-teach ISQA 511 (Managerial Decision Making) 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 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

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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.

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

Yes, there is a prerequisite requirement for this course. You will need to successfully complete a prior course in biostatistics (such as PHPM 524, BSTA 511/611, or equivalent) before enrolling for BMI 560/660.

How does this course fit into the DMICE curriculum?

The DMICE curriculum includes an Evaluative Science branch that is intended to enable informatics students understand the fundamental aspects of scientific research including statistics, qualitative research methods, epidemiology and health data analysis.

BMI 560/660 is one of two core courses in the Evaluative Sciences branch of the curriculum, which also includes an introductory biostatistics course, such as PHPM 524 (Introduction to Biostatistics) or an equivalent learning experience.

This branch also includes a third elective course in evaluation methods that is chosen by the student according to their individual interests and needs (examples include Qualitative Research Methods, Quantitative Research Methods, Software Engineering, or other evaluation courses approved by the student's advisor). **Please note that some of these methods courses offered by DMICE may require BMI 560/660 as a prerequisite.** Also, please note that if you have already taken several of these types of courses, you may not be required to take BMI 560/660.

The DMICE curriculum also delineates a pathway that will prepare students to successfully complete a capstone or thesis project. This course is the second in a three-course series, which also includes BMI 515 (Ethical, Legal and Social Issues in Biomedical Informatics) and BMI 570 (Scientific Writing and Communication for Informatics Students) that prepare first-year masters students to conduct a capstone or thesis project in year two. This course is also an excellent introductory course if you are planning the direction of your research for your PhD.

What makes informatics projects unique?

Informatics projects in the research environment, as well as those in the operational arena, often display a wide spectrum of disparity. Examples of informatics projects are quite varied; from field studies that improve the understanding of tasks and information needs of users, to development projects that design, build, and deploy clinical information systems, to studies that assess the impact of information systems on health care processes and outcomes.

Why is the process of designing an informatics project challenging?

Informaticians are often asked to help design and implement projects in diverse settings that require frameworks to be drawn from different disciplines. Additionally, for their capstone or thesis, informatics students often design projects that traverse several traditional branches of learning.

How will this course help informaticians?

At the most fundamental level, this course provides you with a "toolkit" of design and evaluation concepts that will allow you to build your own projects, both in research as well as the clinical informatics realms.

This course is intended to provide a high-level overview of the concepts, terminology, and strategies needed to design and evaluate projects in biomedical informatics, including methodologies drawn from software engineering, qualitative research, quantitative research, and business administration.

What are the primary learning objectives of this course?

This course will:

1. Provide students with an overview and framework for the design and evaluation of biomedical informatics projects, across a spectrum of system types, developmental stages, user perspectives, and evaluation methods.

2. Examine in detail a variety of design and evaluation methods, and apply them to specific projects in four key categories: quantitative evaluation, qualitative evaluation, software development, and business-oriented planning.

3. Prepare students to design and conduct thesis or capstone research/development projects in biomedical informatics.

Is there a required textbook?

Yes, there is a textbook for this course.

Title: Practical Research: Planning and Design (10th Edition)
Authors: Paul D Leedy and Jeanne Ellis Ormrod
Paperback: 384 pages
Publisher: Addison Wesley; 10 edition (January 16, 2012)
Language: English
ISBN-10: 0132693240
ISBN-13: 978-0132693240

How is this course coordinated?

This class is available to online students.

Students 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 (Pacific): 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

How is the course structured?

The course is structured in a modular fashion as a series of weekly components. Each weekly module includes a lecture, additional reading material, and assignments. Tests may also be held online. Lectures may be delivered by guest lecturers with experience in research or in the operational informatics universe. Guest lecturers may also participate in in-class sessions (for in-class instances of the course).

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

Week 1	Overview of the course
Week 2	Introduction, Definitions
Week 3	Proposals, Frameworks
Week 4	Software design, Usability
Week 5	Software evaluation
Week 6	Quantitative methods part 1: Design
Week 7	Quantitative methods part 2: Evaluation
Week 8	Qualitative methods
Week 9	Business methods
Week 10	Mixed methods, Additional topics
Week 11	Student projects, Finals week

How is the course graded?

The grading framework for this course is:

Assignments and Projects = 40%
Classroom and/or online participation = 30%
Tests and Exams = 30%

Grades are assigned on a curve, but are generally based on the following cutoffs:

A	93-100
A-	90-92.99
B+	87-89.99
B	83-86.99
B-	80-82.99
C+	77-79.99
C	73-76.99
C-	70-72.99
F	<70

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.

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 other deliverables, class participation, and tests) 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, 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.

Each week, students will be required to participate in the Forums on Sakai. Discussions will typically center around an 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 students expected to do in order to successfully complete this course?

To succeed in this course, students are expected to:

1. Review reading assignments; including lectures, chapters from the required textbook, articles or handouts, and engage in 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 discussions; this class actively encourages collaboration, engagement and participation by all students. The student's participation grade is based on their level of contribution to the learning of others.

3. Complete assignments and other deliverables in a timely fashion. It is anticipated that students will substantiate their assertions with appropriate attribution, and demonstrate that they possess the ability to critically retrieve and analyze information that is available in the informatics literature. Some assignments and projects may involve teamwork for preparation, presentation, and grading. As is common in real life, there are penalties for late submissions and bonuses for those who turn their work in early.

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

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 and assignments over the duration of the course.

Please note that this course features a final exam that will be an online closed-book, timed effort, with questions that will be in a multiple-choice format.

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.

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.**

See http://ozone.ohsu.edu/som/faculty/docs/graduatecouncil/profconductpolicy.pdf for details and http://www.ohsu.edu/xd/education/library/research-assistance/plagiarism.cfm?WT_rank=1# for information on code of conduct for OHSU and http://www.ohsu.edu/xd/education/teaching-and-learning-center/for-students/index.cfm for more information on citing sources and recognizing plagiarism.

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 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 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 10-pm and weekends from Noon to 5pm. Do not contact the instructor.