Introduction to Medical Informatics
MED INF 403
Expanded Syllabus

Instructor:
Vikram Sheshadri

Synchronous Session:
Thursday, 7:00 - 9:30 PM Central Standard Time

Description:
This course is a survey of fundamental concepts and activities on information technology as applied to health care. Topics include computer-based medical records, knowledge-bases systems, decision theory and decision support, human-computer interfaces, systems integration, the digital library, and educational applications. Department-specific applications will also be discussed.

Expanded Course Description:
The field of medical informatics has become an essential knowledge base for those involved in the practice of medicine and healthcare. In this course, the student will learn about the academic discipline of medical informatics, the role of medical informatics in clinical health care applications, and the use of medical and financial data in health care applications. The integration of medical research, clinical data, and theory in improving patient outcomes is presented. The nature of medical information and medical decision-making, along with the role of decision support systems and expert systems will be discussed in the course. Other topics include current and emerging information delivery methods such as Web-based databases and decision support systems, enterprise information systems and Regional Health Information Organizations. Students will explore issues of privacy, ethics, and compliance issues in the collection, distribution, and use of medical information, especially patient records.

Texts:
The primary text for the course will be Biomedical Informatics by Shortliffe and Cimino 3rd Edition. Readings will be assigned in advance of each class and can be found on the course Web site. Additionally, online articles will be used to supplement the text.

Text Details:
Biomedical Informatics: Computer Applications in Health Care and Biomedicine Series: Health Informatics
Shortliffe, Edward H. (Ed.)
3rd ed., 2006 Springer Science+Business Media, LLC, XXVI, 1037 p., 159 illus., 4 in color, Hardcover
ISBN: 978-0-387-28986-1

Student Learning Goals:
At the completion of the Foundations of Medical Informatics courses, students should be able to:

- Understand the academic discipline of medical informatics and the role of medical informatics in clinical health care applications.
- Understand how medical data including clinical, administrative, and financial data, is used in health care applications
- Understand the nature of medical knowledge and decision-making and the role of decision support systems and knowledge-based systems.
- Understand how current and emerging information delivery methods including Web-based databases and decision support systems enterprise information systems and Regional Health Information Organizations can be used to enhance patient outcomes
- Be sensitive to issues of privacy, ethics, and compliance issues in the collection, distribution, and use of medical information, especially patient records
- Be able to evaluate current informatics software and systems used for clinical and professional support

- Understand the integration between research, clinical data, and theory in improving patient outcomes

Prerequisites:
There are no formal prerequisites to the course. It will be assumed that the student has some familiarity with databases and how information is organized, stored and retrieved on a computer. Basic statistics will be used to describe information retrieval techniques, but essential topics will be reviewed in class.

Teaching Method:
The instructor will employ a blended teaching and learning approach, with eight synchronous sessions and two group study sessions. The course content will be delivered using a variety of presentation and discussion, including guest speakers. An interactive, team-oriented pedagogy will demand that students take responsibility for their own learning, including facilitating and participating in group and in-class discussions and participating in a group project.

Group Study and Class Projects:
Students will form discussion groups for group study. A different student will be identified as the group facilitator for the two group sessions.

A group project that applies the concepts presented in the course to a challenging situation in healthcare will be required. Groups will prepare a project proposal, final paper and in-class presentation of their project.

Evaluation Method:
Students will be evaluated using the following criteria:

Team project: 20%
Participation and leadership in in-class, group study and group project : 30%
Online midterm exam 25%
In-class final examination: 25%

Grading scale:

A	93-100
A-	90-92
B+	88-89
B	83-87
B-	80-82
C+	78-79
C	73-77
C-	70-72
F	below 70

University Policy

Students with Disabilities
In compliance with Northwestern University policy and equal access laws, we are available to discuss appropriate academic accommodations you may require as a student with a disability. Request for academic accommodations need to be made during the first week of the quarter, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with Services for Students with Disabilities (SSD) for disability verification and for determination of reasonable academic accommodations. For more information, visit http://www.northwestern.edu/disability/

Academic Integrity at Northwestern
Students are expected to comply with University regulations regarding academic integrity. If you are in doubt about what constitutes academic dishonesty, please speak to us before the assignment is due and/or examine the University web site, "How to Avoid Plagiarism at http://www.northwestern.edu/uacc/plagiar.html

Academic dishonesty includes, but is not limited to cheating on an exam (e.g., copying others' answers, providing information to others, using a crib sheet) or plagiarism of a paper (e.g., taking material from readings without citation, copying another student's paper). Failure to maintain academic integrity on an assignment will result in a loss of credit for that assignment – at a minimum. Other penalties may also apply. For more information, visit http://www.scs.northwestern.edu/student/issues/academic_integrity.cfm

Sexual Harassment Policy
It is the policy of Northwestern University that no male or female member of the Northwestern community – students, faculty, administrators or staff – may sexually harass any other member of the community. Sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute harassment when: submission to such conduct is made or threatened to be made, either explicitly or implicitly , a term or condition of an individual's employment or education; or submission to or rejection of such conduct is used or threatened to be used as the basis for academic or employment decisions affecting that individual; or such conduct has the purpose or effect of substantially interfering with an individual's academic or professional performance or creating what a reasonable person would sense as an intimidating, hospital, or offensive employment, educational, or living environment. For more information, visit http://www.northwestern.edu/sexual-harassment/ policy/index.html.

Late Work
Students are expected to submit all assignments by the indicated due date. Late submissions will not be accepted unless previously approved by the instructor.

Course Schedule:
All readings from the text and articles listed online are to be prepared in advance of the Synchronous Session, so you need to read ahead on the syllabus to start working on the readings. Articles and discussion questions are listed in the online course management system.

Online Synchronous Meetings are Thursdays, 7:00 - 9:30 PM Central Standard Time. Some weeks may not have a Sync Session; your Instructor will indicate the exact schedule during the first Sync Session. Students whose schedules do not permit them to attend the synchronous sessions are invited to review the sessions at other convenient times since the sessions will be recorded and placed online. These students can interact with the instructor or graduate assistant if they have questions that have not been addressed in the online sessions. If students need to reschedule online presentations, they should contact the instructor.

Session	Readings	Deliverables (See Assignment pages for more detailed info)	Synchronous Meeting(s) CDT
1 – **Introduction to Medical Informatics; Information Retrieval and Digital Libraries**	**Text chapters 1, 2, 19**	**Individual Homework: Research and write 1-2 page report on standardized coding and classification systems with definitions of terms**	**Join your classmates and instructor for the online discussion. June 25, 2009**
2 – **Data, Information, Knowledge; Medical Information Systems; Systems Development Life Cycle**	**Text chapters 2, 6**	**Nothing to submit** **Please visit the Discussion Board**	**Join your classmates and instructor for the online discussion. July 2, 2009**
3 – **Databases and Information Retrieval Systems; Electronic Medical Record**	**Text chapters 5, 12** **(Several optional articles)**	**Nothing to submit** **Please visit the Discussion Board**	**Join your classmates and instructor for the online discussion. July 9, 2009**
4 – **Standards, Ethical and Privacy Issues**	**Text chapters 7, 10** **Articles:** **-"Informed Consent to the Secondary Use of EHRs"** **-"Privacy-Preserving Data Releases for**	**Group Homework #1: Answer questions that cover your session readings**	**No Synch Session this week**

	Health Report Generation"		
5 – **Medical Reasoning; Probabilistic Methods; Knowledge Base; Clinical Decision Support**	**Text chapters 3, 20**	**Take Midterm** **Submit Group Project Proposals (3-5 pages)**	**Join your classmates and instructor for the online discussion. July 23, 2009**
6 – **Medical Enterprise Information Systems; Hospital Information Systems**	**Text chapters 13, 16**	**Nothing to submit** **Please visit the Discussion Board**	**Join your classmates and instructor for the online discussion. July 30, 2009**
7 - **Emerging Technologies; Computers in Medical Education**	**Text chapter 21** **Articles:** **-Markle Foundation Survey"** **-"What is a PHR?"** **-One of three possible articles for group homework assignment**	**Group Homework #2: Choose an emerging technology to analyze; write a business case**	**Join your classmates and instructor for the online discussion. August 6, 2009**
7 – Cont'd **Human Computer Interface; Consumer Health Informatics; Health Information Infrastructure**	**Text chapters 4, 14, 15** **(Several optional readings)**	**Individual Homework: Prepare a PHR** **Bring to Session 8 synch session**	
8 – **Evaluating Technologies; Integration of Research and Clinical Information**	**Text chapter 11**	**Individual Homework: Use HealthCapture PHR to complete a PHR and evaluate technology**	**Join your classmates and instructor for the online discussion. August 13, 2009**
9 – **Future of Medical Informatics; Imaging Informatics; Final Exam**	**Text chapters 9, 24**	**Present Group Projects** **Watch a video (to be posted on Session 10's *Course Content* folder *prior* to the Final Exam** **Take Final Exam at Testing Site**	**Join your classmates and instructor for the online discussion. August 20, 2009**