COURSE DIRECTOR:
Michael J. McCarthy, Assistant Dean for Information Technology & Medical Informatics
Marshall University Joan C. Edwards School of Medicine
(304) 691-1765
mccarthy@marshall.edu

COURSE RATIONALE:
Information technology lies at the heart of revolutions in many industries, from finance to travel to communications. Health care especially has been touched by technologies which facilitate patient care, management and research. Edward H. Shortliffe and Leslie E. Perreault point out, however, that it is "society's overriding concern for patient well-being, and the resulting need for optimal decision making that sets medicine apart from many other information-intensive fields. Our desire to provide the best possible health and health care for our society gives a special significance to the effective organization and management of the huge bodies of data with which health professionals must deal" (Shortliffe and Perreault, ix). For this reason, the Association of American Medical Colleges has recognized and defined the special field of medical informatics as: "a developing body of knowledge and a set of techniques concerning the organizational management of information in support of medical research, education, and patient care. . . . Medical informatics combines medical science with several technologies and disciplines in the information and computer sciences and provides methodologies by which these can contribute to better use of the medical knowledge base and ultimately to better medical care" (1986).

Information technology holds the potential to revolutionize health care practice if developed and applied appropriately to change physician and patient behavior rather than merely to refine existing practices. Even if practitioners choose to eschew these technologies themselves, they will be faced with patients who do not. Access to health care resources on the Internet, for example, is not limited only to health care providers. Patients may arrive at the doctor's office either very well informed about their condition or grossly misguided by inaccurate yet easily attained online information. For these reasons a course which teaches students and practitioners how to capitalize effectively on these information resources and how to evaluate both their implications and ramifications is warranted.

COURSE OBJECTIVES:
1. Use and evaluate Internet-based electronic communication resources:
   a. Find, subscribe to and participate in an electronic mail discussion list or other e-forum in a health care related area of interest;
   b. Browse and search the World Wide Web for resources in a desired topic area and narrow or broaden the search if needed;
   c. Evaluate the quality of health-care related Internet resources;
   d. Articulate implications of Internet design and function, including bandwidth, content regulation and privacy/encryption/digital signatures.

2. Use and evaluate clinical decision support systems:
   a. Search bibliographies of biomedical literature (e.g., MEDLINE) for articles in a desired topic area and narrow or broaden the search if needed;
   b. Use and evaluate electronic drug information resources (e.g., Electronic Drug Reference, Physician's Desk Reference, Clinical Pharmacology, PharmInfoNet, etc.) to locate pharmacological information such as drug interactions, dosage recommendations, adverse reactions and patient medication advisories;
   c. Use and evaluate expert decision support systems (e.g., Quick Medical Reference, Meditel, DXplain, Illiad, etc.) to generate and refine differential diagnoses based upon physical symptoms and laboratory findings;
   d. Use and evaluate electronic repositories of clinical protocols (CancerNet, US Task Force on Clinical Preventive Services Report, etc.) to develop a treatment plan based on a particular diagnosis;
   e. Articulate the advantages and disadvantages of various clinical study designs;
   f. Understand and employ data analysis techniques such as absolute risk reduction (ARR), relative risk (RR), number needed to treat (NNT) and odds ratio (OR);
   g. Comprehend and employ tools and techniques such as sensitivity (SN) and specificity (SP) of tests, Bayes' Theorem, positive predictive value (PPV), negative predictive value (NPV), expected-value decision analysis and sensitivity analysis to aid in clinical decision making.
3. Understand broad social and legal issues surrounding technology in health care:
   a. Recognize the importance of the discipline of medical informatics, including its mission, scope and current issues;
   b. Recognize the potential of information technology to change health care practice;
   c. Articulate the rational behind and requirements of the federal HIPAA regulations on electronic protected health information (EPHI);
   d. Appraise the potential and limitations of telemedicine in the treatment of patients;
   e. Assess the promise and hurdles of implementing electronic medical record systems;
   f. Critically evaluate a recent technological advance in a health care area of interest;
   g. Envision the clinical information “system-after-next” and identify trends which will spur or impede its development.

COURSE CALENDAR:

Jan 11  Overview of Health Informatics
        Shortliffe, Ch. 1
Jan 18  Background Technologies:  Computer & Storage Systems, Networks & Databases
        Shortliffe, Chs. 2, 4 & 5
Jan 25   Evaluation Methods for Health Informatics Resources
        Shortliffe, Chs. 6 & 8
Feb  1  Internet-Based Health Resources for Patients & Providers
Feb  8  Evidence-Based Medicine & Health Care Decision Analysis
        Shortliffe, Ch. 3
Feb 15  Expert Decision Support Systems & Drug Information Systems
        Shortliffe, Chs. 12 & 16
Feb 22  Telehealth
        Shortliffe, Ch. 14
Mar  1  Electronic Medical Record Systems
        Shortliffe, Ch. 9
Mar  8  HIPAA Privacy Regulations / Computer Security Concepts
Mar 15  HIPAA Security Regulations
Mar 22  SPRING BREAK – NO CLASS
Mar 29   Health Care Performance Measurement and Process Improvement
Apr   5  Mobile Computing and Other Emerging Platforms
Apr  12  Student Presentations
Apr  19  Student Presentations
Apr 26  The Clinical Information “System-After-Next” (Final Draft of Paper Due)
        Shortliffe, Chs. 19 & 20

ATTENDANCE POLICY:
Because of the nature of the course, your absence will diminish the quality of the learning experience for everyone. For this reason, you should make every effort to attend class and should discuss intended absences with the instructor in advance whenever possible (and as soon as possible afterward when not). You may be asked to provide documentation satisfactory to the instructor for any absences for which you request an excuse. Absences in excess of two may result in a lowered final grade for the course. Note that you are responsible at the very least for submitting all assignments on or before their due date, regardless of whether you attend that particular class meeting. You are also responsible for all material, discussions, announcements, etc., made during classes, even when you are absent. Credit for article summary assignments will only be given to those who present them in class; these assignments cannot be made up except by special arrangement at the discretion of the instructor.

TEXTS & READINGS:


Selected articles from Journal of the American Medical Informatics Association (JAMIA; www.jamia.org) and other sources, as assigned throughout the semester.
ASSIGNMENTS:

Your grade in this course will be determined from your performance on two sets of assignments:

Informatics Article Critiques:
These brief (1-2 page) papers are designed to supplement the lecture content of the course. You should select an article related to the previous week’s topic, read it, summarize it and critique it, noting especially any methodology and findings discussed. Be sure to cite your sources properly. You will present your summary in a brief (2–3 minute) oral presentation. The precise dates on which you submit these assignments are flexible – you can elect to present on any class meeting between weeks 4 and 13 (inclusive). You will be responsible for three (3) article summaries during the semester. These summaries are worth 100 points each toward your final grade.

Informatics Resource Evaluation Plan (Paper & Oral Presentation):
In this major assignment for the course you will identify an existing informatics resource (or the need for such a resource) and develop an evaluation model and plan based on the guidelines and suggestions covered in “Evaluation Methods for Health Informatics Resources” (Week 3). The plan should be approximately 12 - 15 double-spaced pages in length and will be worth 450 points toward your final grade. You need not conduct the actual evaluation, but your plan should be detailed enough that it could be conducted by another person. You will also present your plan in class in a 10 minute oral presentation worth 250 points toward your final grade.

GRADING POLICY:

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