MED_INF 405: HIT Technology Integration, Interoperability, & Standards   Winter 2012

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Course Description

This course provides concepts and practical examples of health care information interoperability, standard terminologies, messaging standards, and health information exchange (HIEs). Topics covered by the course include the importance of standards; information architecture; principles and examples of standard terminologies (e.g., ICD, LOINC, SNOMED-CT, CPT); Health Level Seven (HL7) standards (e.g., HL7 version 2 messaging standards, CCD Standard, standards for clinical decision support); and health information exchange. Core principles, challenges, benefits, and limitations will be discussed in each of these topics.

Text

None.

Software

None.

Prerequisites

None.

Course Goals

The goals of this course are to:
* Describe the relevance of information architecture in health care organizations.
* Describe the benefits and challenges of standards-based HIT interoperability.
* Describe principles of controlled standard terminologies.
* Explore U.S. national and international interoperability standards.
* Describe principles of health information exchange.
* Analyze an information systems project to determine the appropriate utilization and integration of HIT standards.

Evaluation

The student's final grade will be determined as follows:
* Discussion Board Participation (20 pts.)
* Assignments (30 pts.)
* Team Project (40 pts.)
* Final Exam (10 pts.)

Total Points: 100 pts.

Grading Scale

A = 90%–100%
B+ = 85%–89%
B = 82%–84%
B- = 78%–81%
C+ = 75%–77%
C = 73%–74%

C- = 65%–72%
F = 0%–64%

Discussion Board Etiquette

The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency is not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism.

Proctored Assessment

There is a proctored assessment requirement in this course. For additional information, please go to the Assignments section in Blackboard and scroll to the Proctored Exam Approval Application item.

Attendance

This course will not meet at a particular time each week. All course goals, session learning objectives, and assessments are supported through classroom elements that can be accessed at any time. To measure class participation (or attendance), your participation in threaded discussion boards is required, graded, and paramount to your success in this class. Please note that any scheduled synchronous or—live—meetings are considered supplemental and optional. While your attendance is highly encouraged, it is not required and you will not be graded on your attendance or participation.

Late Work

Late work will not be accepted unless there are unusual extenuating circumstances. These circumstances must be communicated to the instructor at the earliest possible moment. Under no circumstances will work be accepted that is more than one week late even with an approved circumstance.

Learning Groups

Learning groups are utilized in this course. More information about learning groups will be provided by the instructors via the Blackboard course site.

Academic Integrity at Northwestern

Students are required to comply with University regulations regarding academic integrity. If you are in doubt about what constitutes academic dishonesty, speak with your instructor or graduate coordinator before the assignment is due and/or examine the University Web site. Academic dishonesty includes, but is not limited to, cheating on an exam, obtaining an unfair advantage, and plagiarism (e.g., using material from readings without citing or copying another student's paper). Failure to maintain academic integrity will result in a grade sanction, possibly as severe as failing and being required to retake the course, and could lead to a suspension or expulsion from the program. Further penalties may apply. For more information, visit <www.scs.northwestern.edu/student/issues/academic_integrity.cfm>.

Plagiarism is one form of academic dishonesty. Students can familiarize themselves with the definition and examples of plagiarism, by visiting <www.northwestern.edu/uacc/plagiar.html>. A myriad of other sources can be found online.

Some assignments in this course may be required to be submitted through SafeAssign, a plagiarism detection and education tool. You can find an explanation of the tool at <http://wiki.safeassign.com/display/SAFE/How+Does+SafeAssign+Work>. In brief, SafeAssign compares the submitted assignment to millions of documents in large databases. It then generates a report showing the extent to which text within a paper is similar to pre-existing sources. The user can see how or whether the flagged text is appropriately cited. SafeAssign also returns a percentage score, indicating the percentage of the submitted paper that is similar or identical to pre-existing sources. High scores are not necessarily bad, nor do they necessarily indicate plagiarism, since the score does not take into account how or whether material is cited. If a paper consisted of one long quote that was cited appropriately, it would score 100%. This would not be plagiarism, due to the appropriate citation. However, submitting one long quote would probably be a poor paper. Low scores are not necessarily good, nor do they necessarily indicate a lack of plagiarism. If a 50-page paper contained all original material, except for one short quote that was not cited, it might score around 1%. But, not citing a quotation is still plagiarism.

SafeAssign includes an option in which the student can submit a paper and see the resultant report before submitting a final copy to the instructor. This ideally will help students better understand and avoid plagiarism.

Other Processes and Policies

Please refer to your SCS student handbook at <www.scs.northwestern.edu/grad/information/handbook.cfm> for additional course and program processes and policies.

Course Schedule

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement in Blackboard.

Session 1

Learning Objectives

After this session, the student will be able to:
- Describe the characteristics of health care data.
- Define information architecture.
- Explain the importance and benefits of having an information architecture.
- Describe information interoperability and the importance of interoperability in health care.

Course Content

Online Reading

Shortliffe and Barnett, *Biomedical Data: Their Acquisition, Storage, and Use*
UMLS Metathesaurus
O'Carroll, *Information Architecture*
Benson, *Why Interoperability is Hard* and *UML & XML*
Hammond and Cimino, *Standards in Biomedical Informatics*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

None.

Sync Session

Tuesday, January 3, 2012 from 7–9:30 p.m. (central time).

Session 2

Learning Objectives

After this session, the student will be able to:

- Identify integration issues and the benefits of integration and interoperability.
- Analyze the different levels of interoperability.
- Discuss how standards affect integration and interoperability.

Course Content

Online Reading

Hebda and Czar, *System Integration and Interoperability*

Health Intersections, *Law #1 of Interoperability*

Health Intersections, *Law #2 of Interoperability*

Health Intersections, *Law #3 of Interoperability*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Information Exchange Case is due Sunday, January 15, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 3

Learning Objectives

After this session, the student will be able to:
- Describe principles of controlled terminologies.
- Differentiate controlled standard terminologies.
- Describe the purpose and limitations of pre- and post-coordination.

Course Content

Online Reading

Cimino, *Desiderata for Controlled Medical Vocabularies in the Twenty-First Century*

Chute, Cohn, and Campbell, *A Framework for Comprehensive Health Terminology in the United States*

Bodenreider, *Biomedical Ontologies in Action, Role in Knowledge Management, Data Integration and Decision Support*

Huff, *Development of the Logical Observation Identifier Names and Codes (LOINC) Vocabulary*

Stearns, *SNOMED Clinical Terms: Overview of the Development Process and Project Status*

Nelson, *Normalized Names for Clinical Drugs*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Code the Case is due Sunday, January 22, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 4

Learning Objectives

After this session, the student will be able to:
- Describe the benefits and limitations of HIT vocabulary standards.
- Analyze the components, structure, and use of Unified Modeling Language System (UMLS).
- Describe the functions and benefits of a terminology server.

Course Content

Online Reading

Humphreys, *The Unified Medical Language System: An Informatics Research Collaboration*

Pathak, *LexGrid: A Framework for Representing, Storing, and Querying Biomedical Terminologies from Simple to Sublime*

PHIN VADS – CDC Vocabulary Server

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Terminology Recommendations is due Sunday, January 29, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 5

Learning Objectives

After this session, the student will be able to:

- Describe HL7 version 2 standards.
- Describe the HL7 ADT standard.
- Describe the HL7 Orders and Observations standard.
- Describe the limitations of the HL7 version 2 standards.

Course Content

Online Reading

Health Level Seven Standard Specification Version 2.7(Chapters 3, 4, and 7)

Lin, Lin, Roan, and Yeh, *Critical Factors Influencing Hospital's Adoption of HL7 Version 2 Standards*

Health Intersections, *The Context of Interoperability*

Multimedia

Health Level 7 Version 2

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Team Project — Topic Proposal is due Sunday, February 5, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

8

Session 6

Learning Objectives

After this session, the student will be able to:
- Describe the Reference Information Model (RIM).
- Describe the Clinical Document Architecture (CDA).
- Describe the Continuity of Care Document (CCD).
- Describe HL7 Clinical Decision Support Standards.
- Describe aspects of the EHR meaningful use criteria that depend on the implementation of health interoperability standards.

Course Content

Online Reading

Mead, *Data Interchange Standards in Health Care IT*

Dolin, *HL7 Clinical Document Architecture, Release 2*

Healthcare Information Technology Standards Panel Specifications, *Description of CDA Sections*

Healthcare Information Technology Standards Panel Specifications, *CCD Content Modules*

Dolin, Giannone, and Shadow, *Enabling Joint Commission Medication Reconciliation Objectives with the HL7/ASTM Continuity of Care Document Standard*

Ferranti, *The Clinical Document Architecture and the Continuity of Care Record*

Kawamoto, Del Fiol, Lobach, and Jenders, *Standards for Scalable Clinical Decision Support: Need, Current and Emerging Standards, Gaps, and Proposal for Progress*

Kawamoto, Del Fiol, Orton, and Lobach, *System-Agnostic Clinical Decision Support Services: Benefits and Challenges for Scalable Decision Support*

Blumenthal and Tavenner, *The Meaningful Use Regulation for Electronic Health Records*

The Office of the Coordinator for Health Information Technology, *Electronic Health Records and Meaningful Use*

Multimedia

Health Level 7 Version 3

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Meaningful Use Critique is due Sunday, February 12, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 7

Learning Objectives

After this session, the student will be able to:

- Define semantic interoperability.
- Discuss the goal, vision, and challenges with semantic interoperability.
- Examine the roadmap and recommendation to achieve semantic interoperability.

Course Content

Online Reading

Lenz, *Semantic Integration in Health Care Networks*

Stroetmann, *Semantic Interoperability for Better Health and Safer Health Care*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

First Draft of Team Project is due Sunday, February 19, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 8

Learning Objectives

After this session, the student will be able to:

- Compare and contrast different health information exchange models.
- Describe HIE evaluation methods.
- Describe the impact of HIEs on health care quality and cost.
- Identify obstacles to health information exchange development and operations.
- Identify uses of HIE.
- Identify key HIPAA issues and its solution approaches for health information exchange.

Course Content

Online Reading

Kuperman, *Health-Information Exchange: Why Are We Doing It, and What Are We Doing?*

Marchibroda, *Health Information Exchange Policy and Evaluation*

Ash, *Qualitative Evaluation of Health Information Exchange Efforts*

Hripcsak, *The United Hospital Fund Meeting on Evaluating Health Information Exchange*

Frisse, *The Financial Impact of Health Information Exchange on emergency Department Care*

Kaebler, *Health Information Exchange and Patient Safety*

Shapiro, *Using Health Information Exchange to Improve Public Health*

Gravely and Whaley, *The Next Step in Health Data Exchanges: Trust and Privacy in Exchange Networks*

Blass and Miller, *Protecting Against Breach of Electronic Health Information*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

None.

Sync Session

Session 9

Learning Objectives

After this session, the student will be able to:

- Compare and contrast different health information exchange models.
- Describe HIE evaluation methods.
- Describe the impact of HIEs on health care quality and cost.
- Identify obstacles to health information exchange development and operations.
- Identify uses of HIE.
- Identify key HIPAA issues and its solution approaches for health information exchange.

Course Content

Online Reading

Kuperman, *Health-Information Exchange: Why Are We Doing It, and What Are We Doing?*

Marchibroda, *Health Information Exchange Policy and Evaluation*

Ash, *Qualitative Evaluation of Health Information Exchange Efforts*

Hripcsak, *The United Hospital Fund Meeting on Evaluating Health Information Exchange*

Frisse, *The Financial Impact of Health Information Exchange on emergency Department Care*

Kaebler, *Health Information Exchange and Patient Safety*

Shapiro, *Using Health Information Exchange to Improve Public Health*

Gravely and Whaley, *The Next Step in Health Data Exchanges: Trust and Privacy in Exchange Networks*

Blass and Miller, *Protecting Against Breach of Electronic Health Information*

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Final Version of Team Project is due Sunday, March 4, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Session 10

Learning Objectives

After this session, the student will be able to:

- No new learning objectives will be introduced in this session.

Course Content

None.

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard.

Assignments

Final Exam is due Sunday, March 11, 2012 at 11:55 p.m. (central time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session