Introduction to Health Informatics (101)

U.S. Department
of Veterans Affairs

Veterans Health
Administration

Course Syllabus

COURSE	**Health Informatics (101)**

COURSE DESCRIPTION

Introduction to Health Informatics (101) offers an overview of the field of health informatics by providing students with the fundamental knowledge of the concepts of health informatics and how technology can be used in the delivery of health care. The course is intended to increase VA workforce capacity for the design, configuration, use, and maintenance of informatics interventions that improve health care delivery to our nation's veterans.

Geared towards the community college level, this web-based course is based on the content offered in conjunction with Bellevue College and developed for use in the Office of the National Coordinator (ONC) for Health Information Technology Workforce Development Program. One of six different self-study modules is offered each month on a rotating basis.

COURSE GOALS & OBJECTIVES

Upon completion of all six modules, participants will have:

- Explored how technology can be used to improve health care delivery in health care organizations and in public health.
- Acquired breadth of knowledge of the principles of health informatics.
- Developed basic skills in using health informatics principles to improve practice.
- Acquired a conceptual and theoretical framework of the design, development, and implementation of health information systems.
- Acquired a basic understanding of educational and instructional design theory and principles and how the principles can be applied to deliver effective training to users of health information systems.

COURSE PREREQUISITES

There are no pre-requisites for this course.

It is open to anyone interested in health informatics.

There are no course fees and no tuition requirements for the program.

CREDITING

No CEU/CME is available. General education credit will be offered for each module completed. The course requires completion of at least 80% of the material in each module in order to receive credit. Students who complete all six modules will receive a separate certificate of completion for the HI 101 Introduction to Health Informatics series

COURSE CONTENT AND MATERIALS

Course material is presented via:

- Flash videos and other video lecture formats
- PowerPoint Slides, Adobe PDF and Word documents, web links
- Supplemental readings
- Discussion forums, questionnaires and quizzes

Lectures include the following:

- **Required Lectures:** These constitute the equivalent of textbook material for this training program and this is the content you will be tested on in each module quiz. The lecture content is available in four different formats:
    1. voice-over PowerPoint presentations;
    2. audio files;
    3. audio transcripts; and
    4. PowerPoint PDFs.
- **VA View Lectures:** VA colleagues discuss the module's topics in the context of your organization.
- **Industry Expert Perspectives:** Some modules include presentations by national health IT luminaries sharing their perspectives on varied health IT topics.
- **Optional Lectures:** Some modules include supplemental lectures that provide additional information on module topics so that you may explore a subject in more depth. You will not be tested on this information.

COURSE TIMEFRAMES AND FORMAT

This program includes a mix of video lectures and online discussion as well as individual activities hosted via a learning management system called Moodle. Students can chose to participate in any or all of the six modules in any order. The entire series is repeated every six months. The course website can be accessed at http://vatraining.remote-learner.net/. Students can access the course on any PC with Internet access.

Course work is primarily asynchronous (independent, self-paced). Periodic synchronous (live, real-time activity) instructor-led webinars may be included, and will be recorded for those who cannot attend. Students will be required to access their online classroom to review the lectures and complete activities, including voice over PowerPoints, quizzes, questionnaires, online discussion forums. An extensive list of optional resources is available in each module.

Module Number	Title	Month Offered
1	Overview of Health Informatics	January July
2	Electronic Health Records and Data Standards and Exchange	February August
3	Workflow Analysis and Process Redesign	March September
4	Usability and Human Factors	April October
5	Systems Design and Designing for Safety	May November
6	Effective Training for HIT	June December

Module 1: Overview of Health Informatics

Course Description:

This module will introduce participants to organizations and landmark documents that have contributed to the emergence of Health Informatics as an important discipline in improving the quality and safety in patient care. The nature of Health Informatics as a discipline and key roles and competencies of health informatics practitioners will be described.   Three topic areas: History of Quality Improvement and Patient Safety, Professional Organizations and What is Health Informatics are presented.

Learning Objectives:

1. Define information management, information technology and informatics.
2. Describe various ways in which HIT has evolved to improve quality or enhance patient safety.
3. Summarize the informatics drivers and trends.
4. Describe the origins, current focus, and relationships among the following standards development organizations: Health Level 7 (HL-7), Healthcare Information Technology Standards Panel (HITSP), and Office of the National Coordinator for Health Information Technology (ONC) Health IT Standards Committee.

Credit Hours: 12

Module 2: Electronic Health Records and Data Standards and Exchange

Course Description:

This module will define Electronic Health Records (EHRs) and Personal Health Records (PHRs) and describe how the use of data standards can facilitate health information exchange. It will also introduce participants to several key topics related to the design and use of EHRs. Participants will learn about the relationship between Data Standards, Clinical Practice Guidelines and Evidence Based Care to Clinical Decision Support Systems.

Learning Objectives:

1. Compare and contrast electronic medical record (EMR) with electronic health record (EHR).
2. Describe the emergence of Personal Health Records and their implications for patients, health care providers, and health systems.
3. Describe the fundamental requirements of an effective Clinical Decision Support System.
4. Describe how the principles of health care data exchange and health care data standards relate to patient care, productivity and data analysis.
5. Identify the more common controlled vocabularies in use today: ICD, CPT, NDC, RxNorm, LOINC and SNOMED CT.

Credit Hours: 12

Module 3: Workflow Analysis and Process Redesign

Course Description:

This module will cover the fundamentals of health workflow process analysis and system redesign. Graphical process representation using flow chart diagrams, as well as methods for acquiring the clinical process knowledge needed for diagramming and analysis, are also addressed. The module will introduce the concepts and principles of human computer interaction and human factors as they relate to performance improvement.

Learning Objectives:

1. Discuss the usefulness of workflow analysis in identifying opportunities for improvement.
2. Create a workflow diagram based upon the application of a systematic approach to workflow analysis.
3. Describe strategies to gain acceptance of changes in work processes.
4. Discuss human centered design framework and how it is applied to process redesign.

Credit Hours: 12

Module 4: Usability and Human Factors

Course Description:

This module will provide an introduction to the discipline of human factors with a particular focus on human attention and mental workload, a concept derived from applied cognitive psychology. Analysis of human error as well as usability evaluation methods to evaluate the design of the Electronic Health Record and medical devices to prevent user errors and enhance patient safety, are also addressed. The module will introduce the concept of decision making and the role of Clinical Decision Support Systems in providing cognitive support as well as perpetuating unintended consequences with recommendations for redesign considerations based upon Human Factors analysis.

Learning Objectives:

1. Describe how the concepts of mental workload, selective attention and information overload affect usability
2. Describe the different dimensions of the concept of human error
3. Discuss how human factors analysis can be applied to the study of the Electronic Health Record and medical devices for usability and error prevention.
4. Discuss the advantages and disadvantages (unintended consequences) of Clinical Decision Support Systems (CDSS) in terms of cognitive support.

Credit Hours: 12

Module 5: Systems Design and Designing for Safety

Course Description:

This module will describe approaches to identification of system requirements and strategies for development of safe and effective systems. The focus is on user-centered design, incorporating typical users early in the design process and doing formative evaluations using realistic testing scenarios. Application of usability principles and heuristics to the design of Computerized Provider Order Entry (CPOE) systems that can anticipate and avoid errors is also addressed.

Learning Objectives:

1. Describe principles of sound design to support usability.
2. Identify common sources of error documented in research studies in medicine.
3. Explain principles underlying the design of healthcare systems for safety.

Credit Hours: 10

Module 6: Effective Training

Course Description:

This module will describe approaches in designing effective training strategies for adult learners. The focus is on conducting a training needs assessment, creating lesson plans, selecting the appropriate teaching strategy and modality for your audience and evaluating student outcomes.

Learning Objectives:

1. Identify a process for developing and implementing an instructional needs assessment.
2. Describe a systematic approach to developing an effective lesson plan.
3. Outline a process for designing program evaluations and assessing learner outcomes.

Credit Hours: 12

Academic Honesty	It is expected that students will complete the required discussion forums, knowledge checks, and other assignments as outlined in the module in order to demonstrate that they have learned the course material. The Moodle learning management system tracks student activity including visits to each page, quiz attempts, activity completion, etc., which can be used to independently validate course completion. Responses to assignments, quizzes and exams will be based on the student's own work (except for assignments that explicitly include collaboration). It is expected that students will properly cite any references or works that are not their own and honor any intellectual property rights including copyrights and trademarks. For questions about how to cite academic literature, please refer to http://www.nlm.nih.gov/citingmedicine
Staff and Resources	Course Director: Elizabeth Sears Chapman, MS Ms. Chapman is the Lead for the hi2 Workforce Competency Development Group in Workstream C of the Health Informatics Initiative (hi2). She has a Masters in Health Policy and Management from Harvard School of Public Health. Ms. Chapman has over 30 years of experience in the VA in a variety of management and Health Informatics roles.
Technical Support	For technical issues with registration, access to course, or Moodle issues, students can use the VHAhi2CertHelp@va.gov or the Technical Support Forums from within the course.