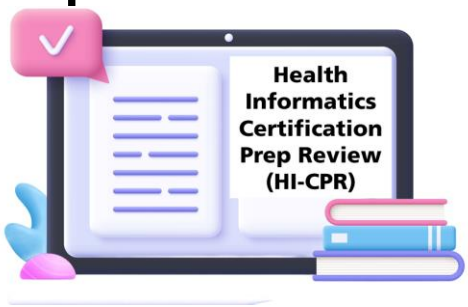
Health Informatics Certification Prep Review Course



DESCRIPTION

The VHA informatics workforce is expected to develop and maintain informatics competencies needed for the implementation and maintenance of the new electronic health record. This course was developed using the VA AMIA 10 x 10 content mapped to the AMIA Health Informatics Delineation of Practice (DoP) document that lists the knowledge, skills, and tasks that informaticians should possess in their field. The resources presented within this course have been mapped to address each area of knowledge.

The **purpose of this course** is to provide:

- Informatics materials that have been mapped to the AMIA Health Informatics Delineation of Practice (DoP) document.
- Valuable tools for informaticians seeking to prepare for various informatics certifications.

This course consists of 11 modules:

Module 1	Fundamentals
Module 2	Evidence-based Practice
Module 3	Clinical Workflow, Process Redesign & Quality Improvement
Module 4	Human Factors Engineering
Module 5	Data Standards
Module 6	Concepts in Data Analytics
Module 7	Clinical Decision Support
Module 8	Information System Life Cycle
Module 9	Leading and Managing Change
Module 10	Population Health
Module 11	Computer Science

AUDIENCE

It is open to anyone interested in expanding their **knowledge in informatics** or those **studying for an informatics exam.**

PREREQUISITES / FEES

There are no pre-requisites for this course. There are no course fees and no tuition requirements for the program.

CONTENT / MATERIALS

Course material is presented via:

- Required readings.
- Videos lecture formats
- PowerPoint slides, Adobe PDFs, word documents, and web links
- Supplemental readings
- Quizzes and Pre and Post tests
- Activities

Lectures include the following:

Required Lectures: These constitute the equivalent of textbook material for this training program. The lecture content is available in four different formats:

- Voice-over PowerPoint presentations
- Audio files
- Audio transcripts; and
- PowerPoint PDFs.

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.

FORMAT

This course utilizes a mix of **video lectures** and **online discussion** as well as individual activities hosted via a learning management system called **Moodle** (Modular Object-Oriented Dynamic Learning Environment).

Course work is primarily **asynchronous** (independent, self-paced). Students can choose (but are not required) to form study groups if desired.

In the course, there are **11 modules**, concentrating on various content areas. To focus your attention on content that would require remediation, **take the module pre-tests**. If you receive a score of 75% or less on any of the module pre-tests, complete the work within that module. After module completion, **take the module post-test** to measure your knowledge acquisition.

There is a course progress checklist and module checklists to track your progress through the content.

SCHEDULE

First course will open in May 2024 and will stay open until December 31, 2024.
Starting in January 2025, the schedule will be as follows:
January to June 30th
July 1st to December 31st

ENROLLMENT

Course: Health Informatics Certification Prep Review 2024 (remote-learner.net)

COURSE SUPPORT STAFF

Course Support Staff ready and willing to assist:

- Kathleen M. Kane, MS, NI-BC, PMP, FAMIA
- Jennifer Kalman, MBA, CPHIMS, FAMIA
- Danielle Marano, MSN, NI-BC, FAMIA
- John Sistrunk, MNA, MCT
- Christina Brech, Med, RD
- Marisa Zamrock
- Leticia Parks, RHIA, MSHI

TECHNICAL SUPPORT

For technical issues with registration, access to course, or Moodle issues, students can use the VHAhi2CertHelp@va.gov or the Technical Support Forum within the course.

Modules

MODULE 1: FUNDAMENTALS

DESCRIPTION	In this module, you will explore the definition of informatics and its interdisciplinary sub-fields as well as privacy, confidentiality and security including the history of privacy and security legislation. This module will also focus on financing health care, ethical and legal aspects within healthcare, patient-provider communication and patient- centered care concepts as well as accreditation, regulatory bodies, and professional associations in the US health care system.
LEARNING OBJECTIVES	1. Define biomedical informatics and related interdisciplinary fields. 2. Match domains of biomedical informatics with sub-fields 3. Identify ethical considerations related to culture and diversity as well as legal considerations within the healthcare arena. 4. Identify key historical efforts related to privacy and security legislation. 5. Define privacy, confidentiality, and security. 6. Identify key concepts related to HIPPA privacy and security rules. 7. Define patient-initiated information exchange and key components of technology used. 8. Identify the key concepts (importance, elements, trust) related to patient-provider communication. 9. Recognize the history and role of the health insurance industry in financing health care in the United States 10. Identify the models of health care financing found in the U.S. 11. Identify and define the role of accreditation, regulatory bodies, and

	professional associations in health care in the U.S.

MODULE 2: EVIDENCE-BASED PRACTICE

DESCRIPTION	The focus of this module is on the topic of Evidence-based Practice (EBP) and searching for best evidence. The importance of informatics and technology support for patient care using the best available evidence is explored, with concentration on application of clinical guidelines. This module will also explore implementation science and evidence-based implementation models. Finally, since information literacy and retrieval skills are essential for all informaticists, information retrieval methods will be introduced.
LEARNING OBJECTIVES	1. Identify levels of evidence assigned to evidence-based literature. 2. Identify benefits of integration of best evidence into electronic health record via a clinical decision support system. 3. Define implementation science. 4. Identify evidence-based implementation models. 5. Identify methods to retrieve information via a literature search. 6. Perform an information retrieval activity.

MODULE 3: CLINICAL WORKFLOW ANALYSIS, PROCESS REDESIGN & QUALITY IMPROVEMENT

DESCRIPTION	This module focuses on health care quality and key quality concepts, various process mapping methodologies and principles of process redesign. The value-based care regulatory environment and U.S. health reform initiatives are addressed.

LEARNING OBJECTIVES	1. Define health care quality and the major types of quality measures: structural, process, and outcome measures. 2. Define the current state of health care quality in the United States 3. Identify the quality measures used in various health care settings in the United States, including those required for the HITECH (Health Information Technology for Economic and Clinical Health Act) meaningful use program. 4. Define measures, metrics, and indicators. 5. Describe the purpose and use of Key Performance Indicators (KPI's) 6. Recognize the benefits of process mapping. 7. Recall standard process mapping symbols and conventions. 8. Identify several process mapping methodologies. 9. Identify some of the national drivers related to quality improvement in healthcare including policy recommendations and strategies (i.e., Health Maintenance organizations, accountable care organizations) to improve health care quality and reduce spending. 10. Recall examples of tools and methods that are used for quality improvement. 11. Identify the role that the electronic health record can play in healthcare quality improvement including common issues in collecting quality and cost measures.

MODULE 4: HUMAN FACTORS ENGINEERING

DESCRIPTION	This module focuses on user-centered design of clinical information systems. The goal is to provide

	students with the knowledge necessary to critically evaluate clinical information systems for selection, implementation and effectiveness based on usability methodologies and Human Factors Engineering (HFE). This module will introduce usability heuristics, medical error and patient safety concepts including error reporting and unintended consequences of health informatics technology and the socio-technical process. In addition, this module will introduce the concept of information visualization.
LEARNING OBJECTIVES	1. Identify usability heuristics used to evaluate a given health informatics scenario. 2. Define the concepts of medical error and patient safety. 3. Identify and contrast the interaction and interdependence of social and technical 4. "resistance to change." 5. Identify the challenges inherent with adapting work processes to new technology. 6. Identify the impact of changing sociotechnical processes on quality, efficiency, and safety. 7. Identify how reporting errors can help to identify HIT system issues. 8. Recognize ways in which HIT can facilitate error reporting and detection. 9. Define user-centered design and conceptual models of design. 10. Identify an iterative design process and its relationship to requirements analysis. 11. Explore information visualization and related concepts. 12. Identify unintended consequences of health information technology.

MODULE 5: DATA STANDARDS

DESCRIPTION	This module focuses on healthcare data standards, the different types of standards, the organizations that develop and maintain those standards, and the role of standards in enabling interoperability and information exchange.

LEARNING OBJECTIVES	1. Upon completion of this module, the learner should be able to: 2. Identify different types of standards (identifier, transaction, message exchange, terminology). 3. Identify major standards development organizations. 4. Recognize major clinical vocabularies and classification systems. 5. Identify the role of data standards in enabling interoperability and information exchange between healthcare systems and organizations. 6. Identify key historical efforts related to health information exchange. 7. Define key terms and components of health information exchanges. 8. Identify the purpose and importance of a Health Information Exchange strategy. 9. Define health care interoperability and types of interoperability. 10. Identify and define common types of tools and technologies used to solve health interoperability problems. 11. Identify the functionality of HL7 V2®, CDA®/CCDA, and FHIR® 12. Identify federal laws, rules and regulations related to health interoperability (i.e., Meaningful Use, ONC certification, health information protection laws)

MODULE 6: CONCEPTS IN DATA ANALYTICS

DESCRIPTION	This module focuses on defining key terms and concepts related to data analytics (Data and analytics types, analytic process steps, data visualization). We will also explore common statistical methods, precision medicine and patient-generated data. In addition, this module reviews data governance and management (analysis tools and techniques, databases & data warehouses), Big Data and concepts related to Artificial

	intelligence/Machine learning. Finally, this module includes several activities to assist in learning these concepts.
LEARNING OBJECTIVES	1. Define and identify common data types. 2. Define basic statistical terms. 3. Recognize common patterns or distributions in statistics. 4. Define Big Data and the role of Data Governance in managing the availability, usability, quality, integrity, and security of enterprise data. 5. Identify and contrast the basic concepts and techniques of Machine Learning and Artificial Intelligence. 6. Define analytics and types of analytics (descriptive, predictive, prescriptive, diagnostic). 7. Recognize the steps of the data analytics process. 8. Identify key terms related to databases and data warehouses. 9. Define precision medicine and key concepts associated with it. 10. Identify considerations related to patient-reported outcome data. 11. Identify effective data visualization techniques to communicate data findings.

MODULE 7: CLINICAL DECISION SUPPORT

DESCRIPTION	This module will focus on the fundamentals of the development of Clinical Decision Support (CDS) tools, the types of tools available, how and when they are used most effectively and relevant issues with this technology. In addition, this module will also review relevant concepts related to knowledge representation in the electronic health record and methods to evaluate predictive algorithms used by Clinical Decision Support Systems.
LEARNING OBJECTIVES	1. Identify and define the history and evolution of clinical decision support.

	2. Identify key concepts concerning Knowledge representation in the electronic health record. 3. Identify information needs and recognize context-specific Info buttons to meet those needs. 4. Define essential concepts related to evaluate predictive algorithms used by CDS (Prevalence, Sensitivity, Specificity, Positive and Negative Predictive Value) 5. Identify legal and ethical issues related to Clinical Decision Support Systems 6. Recognize key attributes related to clinical knowledge management (governance structure, Clinical knowledge management lifecycle, approaches, tools, and processes) 7. Recognize 2 main types of clinical decision support algorithms (rules-based and probability) 8. Identify challenges for implementation and for users, including alignment with workflow. 9. Identify and define the fundamental requirements of effective clinical decision support systems.

MODULE 8: INFORMATION SYSTEM LIFE CYCLE

DESCRIPTION	This module will focus on the System Development Life Cycle and key components within each phase of the life cycle as well as various methodologies used. It will also review information system concepts, characteristics, and different types of information systems.
LEARNING OBJECTIVES	1. Identify methods for system testing and validation, including disaster recovery planning, to ensure that data and system integrity are maintained. 2. Recall essential activities for each of the SDLC phases. 3. Discuss the various methodologies used in the SDLC (i.e., waterfall, incremental, spiral,

	prototyping, agile, RAD). 4. Define the concept of an information system and its characteristics. 5. Recognize the different types of information systems (Patient Monitoring Systems, Administrative, Billing, and Financial Systems) 6. Identify and define the role of genomics in consumer health informatics. 7. Describe key components in planning education. 8. Identify and implement an effective troubleshooting procedure for reporting, evaluating, fixing, deploying, and follow-up of errors, problems, or limitations for the system. **9.** Identify and define the downtime schedule for OS, network, database, and client application maintenance and updates.

MODULE 9: LEADING & MANAGING CHANGE

DESCRIPTION	Module 9 will focus generally on leadership, change management with elements of project management. "While a good project management facilitates change management, the two disciplines are not the same. Project Management is much more linear, and task focused, whereas change management deals with the complexities of human behavior. But a good project plan creates a structure and a foundation in which the change management process can concur. Therefore, the two disciplines, though different, complement and support each other." (1, p2) This module will introduce some of the knowledge and skills that enable clinical informaticians to lead and manage changes associated with implementing clinical information systems and promoting adoption by health professionals. Leading always

	involves other people, and the ability to work together, even across time zones and locations, is a critical skill. *1. McCarthy C, Eastman D. Change Management Strategies for an Effective EMR Implementation. Chicago: Healthcare Information and Management Systems Society; 2010.*
LEARNING OBJECTIVES	1. Identify and define an Information Technology plan. 2. Recognize strategic planning concepts. 3. Identify project management concepts and tools used in informatics projects. 4. Identify basic leadership principles. 5. Recall strategies for health informatics teams' creation, development, and methods to resolve conflicts.

MODULE 10: POPULATION HEALTH

DESCRIPTION	This module focuses on population health and how health care and public health are organized and services are delivered in the U.S. It covers public policy, relevant organizations and their interrelationships, professional roles, legal and regulatory issues, and payment systems. In addition, this module will review predictive analytics for population health, epidemiology, and public health registries.
LEARNING OBJECTIVES	1. Define the terms and describe the perspectives related to population health and public health. 2. Identify and define the paradigms and strategies relevant to improving the health of populations. 3. Define and discuss perspectives related to the concept of risk measurement and segmentation within the population health context. 4. Identify and define the commonly used case identification/predictive

	measurement/modeling tools. 5. Identify and define the revenue cycle and the billing process undertaken by different health care enterprises. 6. Identify the billing and coding processes, standard code sets, different fee-for-service and episode-of-care reimbursement methodologies used by insurers and health care organizations in the claims process. 7. Define clinical epidemiology and types of epidemiology. 8. Identify and define the current applications of epidemiology and how the results influence evidence-based practice. 9. Identify different sources of epidemiological databases and how information is updated and exchanged with clinical entities. 10. Identify and define the purpose of a registry, the types of information contained within public health registries and how this information can be used. 11. Identify security and access issues in the information exchange between communities, clinical institutions, public health departments and federal agencies involved in public health. prevention and control.

MODULE 11: COMPUTER SCIENCE

DESCRIPTION	This module will cover basic computer science concepts such as hardware, software, computer peripherals and networks. It will also address security and privacy of electronic information systems as well as describe the basics of online ethical behavior. In addition, basic computer programming languages and simple queries using SQL commands will be discussed. This module will

	expand on the database concepts described in module 6 by further illustrating data modeling and explanation of normalization.
LEARNING OBJECTIVES	1. Identify and define major components of a computer system (hardware, software, and peripherals) 2. Define the purpose of programming languages. 3. Identify and define the different types of programming languages and list commonly used ones. 4. Identify and define basic programming concepts including variable declarations, assignment statements, expressions, conditional statements, and loops. 5. Identify and define data modeling and normalization. 6. Identify and define a simple relational database and create corresponding SQL commands. 7. Identify different concepts related to networks (basics of network addressing, network topologies, standards and protocols, wireless hardware, logic models) 8. Identify concepts related to security and privacy of electronic systems (common methods of attack, types of malwares, methods, and tools against cyberattacks, wireless device security, and security safeguards used for health care applications.) 9. Identify and define the basics of ethical behavior online.