# Introduction to Health Information Technology
# Course B: Health IT Workflow Specialist

# Curriculum Outline

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**Organization:** Fort Drum Regional Health Planning / Jefferson Community College
**Course:** Introduction to Health Information Technology – Course B: Health IT Workflow Specialist
**Certifications:** AHIMA CHTS-PW and CHTS-CP

The Certified Healthcare Technology Specialist (CHTS) exams will confirm that a student's experience and skills are ready to meet the nation's need for health information technology workers. Workers in this role maintain systems in clinical and public health settings, including patching and upgrading of software. They will interact with end users to diagnose IT problems and implement solutions, document IT problems and evaluate the effectiveness of problem resolution, and support systems security and standards.  As the healthcare industry transitions to electronic health records (EHRs), a nationwide need emerges for skilled specialists trained in Health IT. Individuals who hold national CHTS credentials demonstrate a commitment to the profession and competency in the field.

This certification training course helps to prepare students for up to two CHTS exams:

1. **CHTS-PW:** *Practice Workflow and Information Management Redesign Certification*
2. **CHTS-CP:** *Practitioner Consultant Certification*

Workers in these roles will have the skills needed to reorganize a provider's work to effectively use health IT to improve health care. They may have backgrounds in health care or information technology. Workers in this role assist in reorganizing the work of a provider to take full advantage of the features of health IT in pursuit of meaningful use of health IT to improve health and care. Individuals in this role may have backgrounds in health care (for example, as a practice administrator) or in information technology, but are not licensed clinical professionals.

Workers in this role will:

- Conduct user requirements analysis to facilitate workflow design.
- Integrate information technology functions into workflow and document health information exchange needs.
- Design processes and information flows that accommodate quality improvement and reporting.
- Work with provider personnel to implement revised workflows.
- Evaluate process workflows to validate or improve practice's systems.
- Suggest solutions for health IT implementation problems in clinical and public health settings.
- Assist in selection of vendors and software and advocate for users' needs, acting as a liaison between users, IT staff, and vendors.

Most of the information and curriculum materials are taken from the Office of the National Coordinator (ONC). The ONC has organized the curriculum into a series of components. This course organizes the curriculum material into separate Modules which will closely mirror the ONC Components. Where appropriate the Module name and number will be followed by the matching ONC Component.

- Our course naming convention: "Module"
- ONC's naming convention: "Component"

# Module 1: Fundamentals of Health Workflow Process Analysis & Redesign

(Module 1 = Component 10 and sections of Component 18)

This Module is estimated to provide 15-20 instructional hours, not including activities, assessments, and study time for the CHTS exam. The information contained in this study guide was taken from Component 10 of the Health IT Workforce Curriculum, Version 3.0/Spring 2012.

| Component 10 | Component Objectives |
|---|---|
| **Title:** Workflow Process Analysis and Redesign<br><br>**Description:** Includes topics on workflow redesign, process analysis and change management. Attention is given to the effect of workflow on patient care, Quality Improvement and safety. | • C10.1 Identify how workflow processes effect elements involved in providing patient care.<br>• C10.2 Create process diagrams that support workflow analysis and re-design.<br>• C10.3 Conduct a process analysis to determine effectiveness.<br>• C10.4 Apply quality improvement methods to improve workflow processes in a healthcare setting.<br>• C10.5 Suggest appropriate methods of workflow re-design to improve quality and achieve meaningful use.<br>• C10.6 Describe the benefits and challenges of workflow redesign in healthcare settings. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
    - Component Slide Deck Notes or Videos
    - Component Study Guide
    - Component and Unit Test Questions and Answers
- Access to *Lucid Chart* online flowchart creator (www.lucidchart.com free version is sufficient)
- Account with *NEEHR Perfect* Online Learning EHR and NEEHR Perfect EHR Activities
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 3 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| NEEHR Perfect | Level I Scavenger Hunt – EHR Orientation | Introduction to Neehr Perfect, navigating the EHR and beginner level use of an EHR. | 45 minutes | Beginner |
| NEEHR Perfect | Level II Scavenger Hunt – Essential Skills & Usability | Essential skills needed to navigate the EHR, using filters, setting preferences and more detailed aspects of the electronic chart. | 1 hour | Beginner |
| NEEHR Perfect | Scavenger Hunt IV – Final Evaluation | Summarization of the skills learned in Scavenger Hunts I-III. | 1 hour | Beginner, Intermediate |
| ONC Assignment Modified | Listing Processes Assignment | Watch video and list processes. | 45 minutes | Beginner |
| ONC Assignment Modified | Listing Processes Assignment | Read a scenario. Create an inventory of the processes, both explicit and implicit. | 45 minutes | Beginner |

*Readings:*

1. Crossing the Quality Chasm: a New Health System for the 21st Century by the Institute of Medicine IOM), 2001.

2. Just Enough Structured Analysis by Edward Yourdon.

3. OLI – Module 13, all pages. Complete activities, also.

| Unit 01 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Process Analysis | • U10.1.1 Describe the reason for process analysis in healthcare.<br>• U10.1.2 Describe the role of a Workflow Redesign Specialist<br>• U10.1.3 Describe the relationship between process redesign and Meaningful Use.<br>• U10.1.4 Identify the components, roles and responsibilities of a clinical workflow.<br>• U10.1.5 Identify differences in workflow processes between different facility types. | • IOM and Quality<br>• Meaningful Use<br>• Processes and Workflow<br>• EMR and EHR |

| Unit 02 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Process Mapping | • U10.2.1 Articulate the value of process mapping.<br>• U10.2.2 Describe standard process mapping symbols and conventions.<br>• U10.2.3 Analyze an existing workflow process chart and the sequence of steps.<br>• U10.2.4 Choose an appropriate process mapping method and detail level.<br>• U10.2.5 Create a process map for a health care system. | • Process Mapping<br>• Flowchart<br>• ERDs |

| Unit 03 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Interpreting and Creating Process Diagrams | • U10.3.1 Create flowcharts using ISO 5807 symbols.<br>• U10.3.2 Interpret Yourdon, Gane Sarsen, and UML diagrams.<br>• U10.3.3 Analyze and interpret Entity Relationship Diagrams.<br>• U10.3.4 Determine an appropriate detail level for diagramming. | • ISO 5807<br>• Data Flow Diagrams<br>• Cardinality & Modality<br>• Normalization<br>• Yourdon, UML, Gane Sarsen |

| Unit 04 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Knowledge Acquisition | • U10.4.1 Identify how the strategic goals influence workflow processes.<br>• U10.4.2 Describe the importance of agendas for workflow meetings.<br>• U10.4.3 Compare and contrast different types of knowledge in the workplace.<br>• U10.4.4 Analyze a health care scenario according to CMMI levels.<br>• U10.4.5 Identify processes likely to be used by a health care facility,<br>• U10.4.6 Identify high-level processes and determine how to streamline operations.<br>• U10.4.7 Identify key individuals in to help the Specialist acquire knowledge.<br>• U10.4.8 Create questions to facilitate a productive workflow discussion.<br>• U10.4.9 Choose an appropriate knowledge acquisition method. | • Knowledge Acquisition<br>• Maturity Models<br>• Knowledge Sources<br>• Knowledge Types<br>• Process Inventory |

| Unit 05 | Objectives | Key Concepts |
|---------|-----------|--------------|
| **Title:** Process Analysis | • U10.5.1 Describe the purpose of Process Analysis.<br>• U10.5.2 Describe the skills necessary for Process Analysis.<br>• U10.5.3 Read and Interpret a Process Analysis for a given scenario.<br>• U10.5.4 Identify desired EHR functionality given a Process Analysis. | • Process Analysis Objectives<br>• Variations and Exceptions<br>• EHR functionality |

| Unit 06 | Objectives | Key Concepts |
|---------|-----------|--------------|
| **Title:** Process Redesign | • U10.6.1 Identify the factors that optimize workflow processes.<br>• U10.6.2 Describe how technology can increase efficiency of workflow in healthcare.<br>• U10.6.3 Identify aspects of clinical workflow that are improved by EHR.<br>• U10.6.4 Propose workflow redesigns to ensure safety and efficiency.<br>• U10.6.5 Use EHR functionality and meaningful use objectives to determine a redesign. | • Process Redesign<br>• EHR functionality<br>• Process problems<br>• Human-Centered Design<br>• Meaningful Use (MU) |

| Unit 07 | Objectives | Key Concepts |
|---------|-----------|--------------|
| **Title:** Meeting Facilitation | • U10.7.1 Describe major decisions in process redesign that includes EHR technology.<br>• U10.7.2 Draft an agenda and facilitation plan for a decision making meeting.<br>• U10.7.3 Critique a decision making meeting agenda to identify problems. | • Decision Making<br>• Computer-Aided processes<br>• Implementation Planning<br>• Redesigning for MU |

| Unit 08 | Objectives | Key Concepts |
|---------|-----------|--------------|
| **Title:** Quality Improvement | • U10.8.1 Describe strategies for quality improvement.<br>• U10.8.2 Describe the role of Leadership in Quality Improvement.<br>• U10.8.3 Describe the local clinic improvement capabilities.<br>• U10.8.4 Describe and recommend tools for quality improvement.<br>• U10.8.5 Compare and contrast the quality improvement methodologies. | • Quality Improvement<br>• Proactive & Reactive QI<br>• QI Tools and Charts<br>• Quality Culture |

| Unit 09 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Facilitating and Leading Change | • U10.9.1 Explain possible change concerns in a process analysis & redesign scenario.<br>• U10.9.2 Propose strategies to gain acceptance of changes in work processes.<br>• U10.9.3 Create and critique a facilitation plan, including tools.<br>• U10.9.4 Given a change management scenario, explain potential outcomes.<br>• U18.10.1 Understand the effects of introducing change in an organization.<br>• U18.10.2 Understand the risks and causes of implementation failures. | • Change Management<br>• Change Tools<br>• Planning for Change |

| Unit 10 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Process Change Implementation and Evaluation | • U10.10.1 Develop a Process Change Implementation Plan for a health care facility.<br>• U10.10.2 Identify management tracking and measurement opportunities for the process change.<br>• U18.10.3 Outline elements of an evaluation plan that will help determine the success of change.<br>• U18.10.4 Describe how an analyst helps a health care facility continually improve workflow processes. | • Common process changes<br>• Communication<br>• Change Problems<br>• Evaluating Change |

| Unit 11 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Maintaining and Enhancing Improvements | • U10.11.1 Design control strategies to maintain performance of clinic processes<br>• U10.11.2 Develop and present a sustainability and continuous improvement plan.<br>• U10.11.3 Develop plans to keep the practice running if the EHR system fails.<br>• U10.11.4 Work with practice staff to evaluate new processes. | • Performance gains<br>• Business Continuity Plans<br>• Contingencies<br>• EHR Failure |

# Module 2: Introduction to Computer Programming and Databases

(Module 2 = Component 4)

| Component 04 | Component Objectives |
|---|---|
| **Title:** Computer Programming and Databases<br><br>**Description:** This component provides a basic overview of computer architecture; data organization, representation and structure; structure of programming languages; networking and data communication. It also includes basic terminology of computing. | • C4.1 Learn correct terminology for computing and technology including for hardware, software, networks, Internet and databases<br>• C4.2 Identify commonly used hardware components.<br>• C4.3 Identify commonly used software applications and operating systems.<br>• C4.4 explain the function and use of programming languages and identify commonly used languages.<br>• C4.5 Define what a database is, explain what querying languages are and identify commonly used database systems.<br>• C4.6 Describe network computing, its benefits and risks, and identify commonly used communications hardware and software components.<br>• C4.7 Identify security risks for computing systems and discuss potential solutions.<br>• C4.8 Explain the design and development process of a software information system such as an EHR. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
  - Component Slide Deck Notes or Videos
  - Component Study Guide
  - Component and Unit Test Questions and Answers
- Access to a typical home style wireless router/switch
- Microsoft Excel
- Ethernet Cable, 2 RJ-45 clips, Ethernet Crimpers, Cable Tester (On-Campus)
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 2 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| | The SHIN-NY (New York Information Exchange) | Watch a two minute video on the SHIN-NY (NY Information Exchange) and describe what it is, it's potential benefits and possible challenges. | 1 hour | Beginner, Intermediate |
| | Home Router Configuration | Log into home router and configure it according to the directions. | 45 minutes | Beginner, Intermediate |
| On-Campus | Create Ethernet Cable | Create a 3-6 foot Ethernet cable by terminating both ends using a T568B configuration. Test the cable. | 45 minutes | Beginner, Intermediate |
| Excel Programming Project | Meaningful Use Spreadsheet and Dashboard | Create a Meaningful Use Spreadsheet and Dashboard in Excel according to the assignment guidelines. | 3-5 hours | Intermediate |

*Readings:*

OLI – Module 8, page 74 / Module 9, page 81 / Module 11, all pages.

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Computing Concepts | • U4.1.1 Define what a computer is.<br>• U4.1.2 Describe different types of computers, including PCs, mobile devices and embedded computers.<br>• U4.1.3 Define the common elements of computer systems.<br>• U4.1.4 Describe the various hardware and software options for typical desktop, laptop and server systems for home and business use with a focus on healthcare systems.<br>• U4.1.5 Explain the development of computers and the Internet, including healthcare systems, up until the present time. | • Hardware<br>• File Systems<br>• Acquisitions |

| Unit 2 | Objectives | Key Concepts |
|---|---|---|
| **Title:** The Internet | • U4.2.1 Define the Internet and how to connect to it.<br>• U4.2.2 Define the World Wide Web and how to access it<br>• U4.2.3 Write queries for Internet search engines, filter the results and evaluate credibility of information.<br>• U4.2.4 Discuss security and privacy concerns on the Internet.<br>• U4.2.5 Describe ethical issues for the Internet.<br>• U4.2.6 Explore online healthcare applications and associated security and privacy issues including HIPAA. | • Internet<br>• Standards<br>• Protocols<br>• Privacy<br>• Security<br>• HIPAA |

| Unit 3 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Computer Hardware | • U4.3.1 List the major elements of a computer.<br>• U4.3.2 Describe how data is stored in memory and in secondary storage.<br>• U4.3.3 Describe how data is represented in binary notation.<br>• U4.3.4 Describe the function of the central processing unit (CPU) of the computer.<br>• U4.3.5 Describe how data is input/output from a computer.<br>• U4.3.6 Describe how the elements of a computer system work together.<br>• U4.3.7 Explain how specialized architectures and embedded systems are used in healthcare settings. | • Memory<br>• Storage<br>• Network |

| Unit 4 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Computer Software | • U4.4.1 Define application vs. system software.<br>• U4.4.2 Give examples of application software focusing on healthcare systems.<br>• U4.4.3 Describe the functions of system software.<br>• U4.4.4 List different types of operating systems.<br>• U4.4.5 Explain the purpose and usage of file systems. | • Application Software<br>• Software<br>• File systems |

| Unit 5 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Computer Programming | <ul><li>U4.5.1 Define the purpose of programming languages.</li><li>U4.5.2 Differentiate between different types of programming languages and list commonly used ones.</li><li>U4.5.3 Explain the compiling and interpreting process for computer programs.</li><li>U4.5.4 Learn basic programming concepts including variable declarations, assignment statements, expressions, conditional statements and loops.</li><li>U4.5.5 Describe advanced programming concepts including objects and modularity.</li></ul> | <ul><li>Programming</li><li>Algorithm</li><li>Java, C++</li><li>Control Structures</li><li>OOP</li><li>Compilers and Interpreters</li></ul> |

| Unit 6 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Databases | <ul><li>U4.6.1 Define and describe the purpose of databases.</li><li>U4.6.2 Define a relational database.</li><li>U4.6.3 Describe data modeling and normalization.</li><li>U4.6.4 Describe the structured query language (SQL).</li><li>U4.6.5 Define the basic data operations for relational databases and how to implement them in SQL.</li><li>U4.6.6 Design a simple relational database and create corresponding SQL commands.</li><li>U4.6.7 Examine the structure of a healthcare database component.</li></ul> | <ul><li>Data</li><li>Normalization</li><li>Tables</li><li>Relational DBs</li><li>SQL</li></ul> |

| Unit 7 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Networks | • U4.7.1 List and describe the various types of communications and network addressing.<br>• U4.7.2 List and define the different types of networks.<br>• U4.7.3 Describe different network topologies.<br>• U4.7.4 List and describe different network standards and protocols.<br>• U4.7.5 Describe wireless communication.<br>• U4.7.6 List and describe network hardware. | • IP Address<br>• Wi-Fi, Ethernet<br>• Bandwidth<br>• LAN, WAN<br>• DNS, ISP<br>• DHCP<br>• OSI Model<br>• Topologies |

| Unit 8 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Security | • U4.8.1 List and describe common security concerns.<br>• U4.8.2 Describe safeguards against common security concerns.<br>• U4.8.3 Describe security concerns for wireless networks and how to address them.<br>• U4.8.4 List security concerns/regulations for health care applications.<br>• U4.8.5. Describe security safeguards used for health care applications. | • Threats and Viruses<br>• Security<br>• Federal Regulations |

| Unit 9 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Information Systems | • U4.9.1 Define an information system, how one is used and list examples.<br>• U4.9.2 Describe the components of an information system.<br>• U4.9.3 Describe the process for developing an information system.<br>• U4.9.4 Describe the different types of testing and when testing should occur.<br>• U4.9.5 Describe how information systems are supported and maintained over time.<br>• U4.9.6 Describe specialized information systems.<br>• U4.9.7 Explain how information systems are used in healthcare. | • System<br>• Systems Development<br>• Testing |

| Unit 10 | Objectives | Key Concepts |
|---|---|---|
| **Title:** The Future of Computing | • U4.10.1 Describe the latest advances in technology.<br>• U4.10.2 Discuss the implications of advances in technology for healthcare systems, including potential risks. | • Computing Trends<br>• Interfaces<br>• The cloud<br>• Social Implications<br>• Ubiquitous Computing |

# Module 3: Health Management Information Systems

(Module 3 = Component 06)

| Component 06 | Component Objectives |
|---|---|
| **Title:** Health Management Information Systems<br><br>**Description:** This component is an introduction to health IT standards, health-related data structures, and software applications. There is also a brief overview of enterprise architectures and public health organizations. | • C6.1 Describe general functions, purposes and benefits of health information systems in various settings.<br>• C6.2 Describe initiatives and developments that have influenced the adoption of health information systems.<br>• C6.3 Compare/Contrast different types of health information systems.<br>• C6.4 Explain how electronic health records affect patient safety, quality care, efficiency, productivity, etc.<br>• C6.5 Propose strategies to minimize major barriers to the adoption of electronic health records.<br>• C6.6 Explain how principles of data exchange and standards relate to patient care, productivity and data analysis. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
    - Component Slide Deck Notes or Videos
    - Component Study Guide
    - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 3 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| | Federated vs. Centralized HIE | Complete the HIE assignment. | 1 hour | Beginner, Intermediate |
| NEEHR Perfect | Scavenger Hunt III – Meaningful Use | Coded and non-coded data, health factors, purpose of meaningful use. | 1 hour | Beginner, Intermediate |
| NEEHR Perfect | Implementing Clinical Decision Support (CDS) | Introduces and demonstrates Clinical Decision Support (CDS) by simulating parts of the *CDS Starter Kit: Smoking Cessation* in the EHR. In completing the Critical Thinking Questions the student will develop their own clinical decision support plan. *This could be used as a small project.* | 1-2 hours | Intermediate |
| NEEHR Perfect | Clinical Decision through Orders | In this activity the student will be introduced to and explore order checks in the EHR and their role in clinical decision making | 1 hour | Intermediate |

*Readings:*

OLI – pages 68-90

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Health Informatics | • U6.1.1 Define information management, information system (technology) and informatics<br>• U6.1.2 Explain the basic theoretical concept that underlies informatics practice<br>• U6.1.3 Define the meaning of biomedical and health informatics as a field of study<br>• U6.1.4 Describe the biomedical informatics areas of applications<br>• U6.1.5 Summarize the informatics drivers and trends<br>• U6.1.6 State the professional roles and skills of health informaticians<br>• U6.1.7 Identify how health informaticians process data into information and knowledge. | • Data<br>• Information<br>• Knowledge<br>• Informatician<br>• Biomedical Informatics |

| Unit 2 | Objectives | Key Concepts |
|---|---|---|
| **Title**: HIS Overview | • U6.2.1 Define the concept of an information system and its characteristics.<br>• U6.2.2 Describe the different types of information systems.<br>• U6.2.3 Describe various types of technologies that support health care information systems.<br>• U6.2.4 Examine the challenges presented by emerging trends.<br>• U6.2.5 Discuss the advantages and disadvantages of the Internet as a platform for health care apps. | • Emerging Trends |

| Unit 3 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Electronic Health Records (EHRs) | • U6.3.1 State the similarities and differences between an EMR and EHR.<br>• U6.3.2 Identify attributes and functions of an EHR.<br>• U6.3.3 Describe perspectives of EHRs which could influence adoption.<br>• U6.3.4 Explain how the use of an EHR can affect outcomes.<br>• U6.3.5 Discuss how Health Information Exchange (HIE) and eHealth Exchange impact health care.<br>• U6.3.6 Outline issues regarding governmental regulation of EHRs.<br>• U6.3.7 Summarize how the IOM Vision for 21st Century Health Care and Wellness may impact HIMs.<br>• U6.3.8 Identify how biomedical informatics can affect future uses of health information systems. | • External Influences<br>• IOM<br>• eHealth Exchange<br>• Direct<br>• CONNECT |

| Unit 4 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Computerized Provider Order Entry (CPOE) | • U6.4.1 Describe the purpose, attributes and functions of CPOE.<br>• U6.4.2 Explain ways in which CPOE is currently being used in health care.<br>• U6.4.3 Discuss the major value to CPOE adoption.<br>• U6.4.4 Identify common barriers to CPOE adoption.<br>• U6.4.5 Identify how CPOE can affect patient care safety, quality, efficiency, and patient outcomes. | • CPOE<br>• Pros and Cons |

| Unit 5 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Clinical Decision Support Systems (CDS) | • U6.5.1 Describe the history and evolution of clinical decision support.<br>• U6.5.2 Describe the fundamental requirements of effective clinical decision support systems.<br>• U6.5.3 Discuss how clinical practice guidelines and evidence-based practice affect CDS.<br>• U6.5.4 Identify challenges and barriers to building and using clinical decision support systems.<br>• U6.5.5 Discuss legal and regulatory considerations related to the distribution of CDS.<br>• U6.5.6 Describe current initiatives that will impact the future and effectiveness of CDS. | • Evidence Based Medicine<br>• Clinical Practice Guidelines<br>• Perspectives |

| Unit 6 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Patient Monitoring Systems | • U6.6.1 Describe the purpose, attributes, and functions of patient monitoring systems.<br>• U6.6.2 Discuss ways in which automation can improve the quality of patient care.<br>• U6.6.3 Analyze how the integration of data from many sources assists in making clinical decisions.<br>• U6.6.4 Discuss how telehealth communication technologies support clinical care.<br>• U6.6.5 Discuss the effectiveness and economic benefit of telehealth.<br>• U6.6.6 Examine how smart technology in the home can enhance the quality of patient care. | • Telehealth<br>• Telemedicine<br>• Patient Monitoring Systems |

| Unit 7 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Medical Imaging | • U6.7.1 Examine the purposes, processes, and management issues<br>• U6.7.2 Understand the economic and technological factors associated with digital displays<br>• U6.7.3 Describe the major challenges<br>• U6.7.4 Describe the future directions | • MIS<br>• PACS<br>• DICOM<br>• CT Scan<br>• PET Scan<br>• MRI |

| Unit 8 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Consumer Health Informatics | • U6.8.1 Explain how current and emerging technologies have impacted consumer health informatics.<br>• U6.8.2 Describe the role of genomics in consumer health informatics.<br>• U6.8.3 Describe the emergence of personal health records and their implications.<br>• U6.8.4 Discuss how consumerism influences the health information systems. | • Personal Health Records<br>• Patient Portal<br>• Consumerism |

| Unit 9 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Administrative, Billing, Financial Systems | • U6.9.1 Explain applications that need to be integrated in health care information systems<br>• U6.9.2 Describe the strategies used by health care organizations to ensure integration of functions<br>• U6.9.3 Discuss the critical elements needed to integrate billing, financial, and clinical systems<br>• U6.9.4 Discuss the core elements of a Master Patient Index (MPI)<br>• U6.9.5 Describe current trends to establish a Unique Patient Identifier (UPI) | • MPI and ADT<br>• UPI<br>• Ancillary Systems |

# Module 4: Usability and Human Factors

(Module 4 = Component 15)

| Component 15 | Component Objectives |
|---|---|
| **Title:** Usability and Human Factors<br><br>**Description:** Discussion of rapid prototyping, user-centered design and evaluation, usability; understanding effects of new technology and workflow on downstream processes; facilitation of a unit-wide focus group or simulation. | • C15.1 Articulate a systems approach to usability and human factors.<br>• C15.2 Explain the cognitive consequences of health information technology on clinical performance.<br>• C15.3 Evaluate key factors into workplace decisions for selecting vendor-specific systems.<br>• C15.4 Identify the consequences of suboptimal design in the delivery of healthcare.<br>• C15.5 Apply different methods to decisions regarding systems evaluation.<br>• C15.6 Apply requirements engineering methods to inform design and technology selection.<br>• C15.7 Demonstrate concept knowledge of cognition and human performance models.<br>• C15.8 Apply concept knowledge of ergonomics to human factors engineering.<br>• C15.9 Select the most appropriate usability evaluation methods.<br>• C15.10 Apply principles of usability and design to critiquing EHR systems.<br>• C15.11 Diagnose problems associated with a clinical decision support system.<br>• C15.12 Apply cognitive methods of analysis to medical device testing.<br>• C15.13 Evaluate user interface designs using various methods.<br>• C15.14 Diagnose various types of errors and create or select potential solutions.<br>• C15.15 Select appropriate technology input methods given different technology uses.<br>• C15.16 Describe how information visualization can support and enhance data representation.<br>• C15.17 Describe the role of mobile and ubiquitous computing in healthcare. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
  - o Component Slide Deck Notes or Videos
  - o Component Study Guide
  - o Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 3 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| NEEHR Perfect | Assessing Commercial Vendors Part I | Learn about the different ways to assess EHR vendors, an introduction to five specific vendors and some of the important factors associated with choosing an EHR. | 1 ½ hours | Beginner, Intermediate |
| NEEHR Perfect | Assessing Commercial Vendors Part II | Learn about the different ways to assess EHR vendors, an introduction to important factors associated with choosing an EHR, such as certification and meaningful use. | 1 ½ hours | Beginner, Intermediate |
| NEEHR Perfect | EHR Evaluation | Students will utilize their knowledge of the EHR to complete an evaluation of the EHR. *This could be used as a small group project.* | 2 ½ hours | Intermediate |
| NEEHR Perfect, Practice Fusion, Kareo | Practice Fusion vs. Kareo vs. NEEHR Perfect (VistA CPRS) | Students will utilize their knowledge of EHRs to complete a comparison two EHRs in terms of usability. *This could be used as a small group project.* | 2 ½ hours | Intermediate |

OLI – Module 15, all pages (all activities).

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** People and Technology | • U15.1.1 Explain the importance of technology in health.<br>• U15.1.2 Describe the contributions of Human-Computer interaction to the Health field.<br>• U15.1.3 Define the concept of system usability.<br>• U15.1.4 Describe the seven stages of User Activity in Norman's Theory of Action.<br>• U15.1.5 Demonstrate concept knowledge of principles of user-centered design.<br>• U15.1.6 Describe the role of human factors and human computer interaction concerning patient safety.<br>• U15.1.7 Demonstrate principles of user-centered design and sources of usability evidence.<br>• U15.1.8 Identify the various types of errors in medicine.<br>• U15.1.9 Identify patient safety issues. | • Human Centered Design<br>• Human Computer Interaction<br>• IOM Reports<br>• Medical Errors<br>• Patient Safety |

| Unit 2 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Requirements Engineering | • U15.2.1 Explain the role of requirements gathering in usability evaluation.<br>• U15.2.2 Identify the uses, advantages, and disadvantages of data collection methods.<br>• U15.2.3 Demonstrate an understanding of how to conduct a workflow analysis.<br>• U15.2.4 Identify contextual design principles as they apply to the healthcare setting.<br>• U15.2.5 Describe the methods to interpret results of data collection. | • Requirements Gathering<br>• Contextual Design<br>• Analyzing Methods |

| Unit 3 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Cognition and Human Performance | • U15.3.1 Define the concept of cognitive engineering.<br>• U15.3.2 Describe representational effect as it applies to human computer interaction and web design.<br>• U15.3.3 Describe how humans process information and obtain skills.<br>• U15.3.4 Describe Gestalt principles of perception and their relevance.<br>• U15.3.5 Describe the processes of memory and their relationship to web-design.<br>• U15.3.6 Describe the cognitive constructs for mental representation.<br>• U15.3.7 Explain how performance models should inform iterative design processes. | • Human Cognition<br>• Mental Models<br>• Representational Effects<br>• Distributed Cognition<br>• Skills Acquisition<br>• Iterative Design |

| Unit 4 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Human Factors and Healthcare | • U15.4.1 Distinguish between human factors and human computer interactions (HCI).<br>• U15.4.2 Explain how ergonomics can be applied to human factors engineering.<br>• U15.4.3 Describe how mental workload, selective attention, information overload affect usability.<br>• U15.4.4 Describe the different dimensions of the concept of human error.<br>• U15.4.5 Describe a systems-centered approach to error and patient safety.<br>• U15.4.6 Apply methods for measuring mental workload and information overload.<br>• U15.4.7 Describe how human factors analysis can be applied to the study of medical devices. | • Human Factors Engineering<br>• Ergonomics<br>• Mental Workload<br>• Selective Attention<br>• Human Error |

| Unit 5 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Usability Evaluation | • U15.5.1 Describe the importance of usability in relation to health information technologies.<br>• U15.5.2 List and describe usability evaluation methods.<br>• U15.5.3 Determine which usability evaluation method would be most appropriate and effective.<br>• U15.5.4 Describe the appropriate tasks for a usability test.<br>• U15.5.5 Describe the usability testing environment, required equipment, logistics, and materials.<br>• U15.5.6 Conduct a cognitive walkthrough. | • Focus Groups<br>• Interviews<br>• Cognitive Task Analysis<br>• Usability Inspection<br>• Heuristic Evaluation<br>• Usability Testing |

| Unit 6 | Objectives | Key Concepts |
|---|---|---|
| **Title:** EHR Usability | • U15.6.1 Discuss the role of usability testing, training and implementation of EHRs.<br>• U15.6.2 Describe and define usability as it pertains to the EHR (HIMSS document).<br>• U15.6.3 Explain the challenges of EHR design and usability in typical workflow.<br>• U15.6.4 Identify principles of usability/design & describe their application to EHRs (HIMSS).<br>• U15.6.5 Identify usability methods for enhancing efficiency and minimizing error (HIMSS).<br>• U15.6.6 Explain how user-centered design can enhance adoption of EHRs.<br>• U15.6.7 Describe Web 2.0 and novel concepts in system design.<br>• U15.6.8 Identify methods of rating EHR usability (HIMSS document). | • Usability Inspection<br>• Focus Groups<br>• Web 2.0 |

| Unit 7 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Usability and CDS | • U15.7.1 Understand the cognitive basis for decision making and its effect on clinical errors.<br>• U15.7.2 Discuss the role of usability testing, training and implementation of clinical decision support.<br>• U15.7.3 Describe and define usability as it pertains to clinical decision support.<br>• U15.7.4 Identify examples of usability barriers to adoption of clinical decision support.<br>• U15.7.5 Identify a set of well-established principles of usability and design with CDS. | • Human Decision Making<br>• CDSS and Human Decisions<br>• Factors and Barriers<br>• Design Improvement |

| Unit 8 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Approaches to Design | • U15.8.1 Explain a user-centered design approach.<br>• U15.8.2 Define conceptual models.<br>• U15.8.3 Explain the iterative design process.<br>• U15.8.4 Describe requirements analysis and cognitive task analysis.<br>• U15.8.5 Characterize the role of prototypes in design<br>• U15.8.6 Describe the principles of participatory design.<br>• U15.8.7 Describe principles of sound design to support usability.<br>• U15.8.8 Describe how Nielsen's heuristics and design principles apply to user interface design.<br>• U15.8.9 Explain the difference between low fidelity and high fidelity prototypes. | • Nielsen's Heuristics<br>• Card Sorting<br>• Prototypes<br>• Participatory Design<br>• Iterative Design |

| Unit 9 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Ubiquitous Computing | • U15.9.1. History of Ubiquitous computing and basic principles.<br>• U15.9.2. Describe the role of mobile and ubiquitous computing in healthcare.<br>• U15.9.3 Describe some of the technical Challenges. | • Context-Sensitive Applications<br>• Mobile Platforms<br>• Mobile EHRs |

| Unit 10 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Designing for Safety | • U15.10.1 Define "workflow analysis" and methods for examining and addressing human errors.<br>• U15.10.2 Design a workflow analysis study.<br>• U15.10.3 Identify common sources of error documented in research studies in medicine.<br>• U15.10.4 Apply the cognitive taxonomy of errors.<br>• U15.10.5 Apply principles underlying the design of healthcare systems for safety. | • Workflow Analysis<br>• Cognitive Taxonomy of Errors |

| Unit 11 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Input and Selection | • U15.11.1 Provide a rationale as to why input methods are important in designing.<br>• U15.11.2 Compare and contrast technology input methods.<br>• U15.11.3 Select appropriate technology input methods given different technology. | • Context-Sensitive Menus<br>• Menu Structures |

| Unit 12 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Information Visualization | • U15.12.1 Identify/describe the role of information visualization and describe its purpose.<br>• U15.12.2 Describe how information visualization can support and enhance representations. | • Information Visualization<br>• Scientific Visualization<br>• Aggregate data and trends |

# Module 5: Quality Improvement

(Module 5 = ONC Component 12 and sections of Component 18)

| Component 12 | Component Objectives |
|---|---|
| **Title:** Quality Improvement<br><br>**Description:** Introduces the concepts of health IT and practice workflow redesign as instruments of quality improvement. Addresses establishing a culture that supports increased quality and safety. Discusses approaches to assessing patient safety issues and implementing quality management and reporting through electronic systems. | • C12.1 Analyze clinical decision-making requirements.<br>• C12.2 Design and implement information technology that supports effective teamwork.<br>• C12.3 Analyze workflows to design technology that supports clinical decision-making and care coordination.<br>• C12.4 Design and apply of information technology and practices that support safety and quality.<br>• C12.5 Formulate activation planning that supports and maintains safety and quality.<br>• C12.6 Select and apply quality measures for incorporation into information systems.<br>• C12.7 Assess findings from quality reviews to implement clinical information system improvements.<br>• C12.8 Select improvement tools to assist clinical teams in improving the quality and safety of EHRs.<br>• C12.9 Monitor use of information technology for inappropriate use leading to hazards and errors.<br>• C12.10 Design a culture conducive to reliable processes built on human factors research.<br>• C12.11 Implement effective strategies to use information technology to decrease reliance on memory. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
    - Component Slide Deck Notes or Videos
    - Component Study Guide
    - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 3 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| NEEHR Perfect | Quality Improvement Utilizing the EHR | This activity involves using the electronic health record as a resource to analyze and learn about quality management and performance improvement within the healthcare system. | 1 ½ hours | Intermediate |
| NEEHR Perfect | Cause and Effect | Introduces a facilitated error and where HIT systems could increase potential user error | 1 ½ hours | Intermediate |
| NEEHR Perfect | Case Study Review | A detailed review of a chart and its contents to determine what is present, or not present, in the chart. | 1 hour | Beginner, Intermediate |

*Readings:*

OLI – Module 28, all pages (all activities)

| Unit 1 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Intro to Quality Improvement | • U12.1.1 Identify the current challenges in health care quality.<br>• U12.1.2 Examine the components of the health care system that have an impact on quality.<br>• U12.1.3 Describe QI as a goal of meaningful use of HIT.<br>• U12.1.4 Analyze the ways that HIT can either help or hinder quality improvement.<br>• U12.1.5 Explain health care quality and quality improvement (QI). | • Quality Improvement |

| Unit 2 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Principles of Quality and Safety | • U12.2.1 Investigate the fallibility of people and systems.<br>• U12.2.2 Describe the ways that every system is designed to achieve the results it gets.<br>• U12.2.3 Apply the basic principles of safe design.<br>• U12.2.4 Explain the ways that teams make wise decisions with diverse and independent input. | • Improving Patient Safety |

| Unit 3 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Reliability | • U12.3.1 Discuss the basic concepts of reliability.<br>• U12.3.2 Understand what makes organizations highly reliable. | • Reliability and HIT |

| Unit 4 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Reliability and a Culture of Safety | • U12.4.1 Discuss reliability as a tool for ensuring safety.<br>• U12.4.2 Examine how ultra-safe organizations operate.<br>• U12.4.3 Identify how teams make wise decisions. | • Safety Culture |

| Unit 5 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Decision Support and Quality Improvement | • U12.5.1 Define decision support, its importance and why it is difficult to implement.<br>• U12.5.2 Compare decision support tools that help improve quality.<br>• U12.5.3 Analyze the benefits and shortfalls of alerts and clinical reminders. | • CDSS Basics<br>• Alerts and Reminders |

| Unit 6 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Workflow Design | • U12.6.1 Assess decision-making requirements in health or health care.<br>• U12.6.2 Construct a work process flow chart.<br>• U12.6.3 Appraise ways of incorporating decision-making requirements into HIT design. | • Workflow Assessments<br>• Work Process Flow Charts |

| Unit 7 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Leadership, Teamwork and Communication | • U12.7.1 Assess the impact of teamwork and communication on patient safety and care coordination.<br>• U12.7.2 Investigate ways in which HIT design can serve as a barrier to effective communication.<br>• U12.7.3 Describe ways in which HIT design can enhance communication and care coordination.<br>• U18.5.1 Describe an IT Strategic Plan and a typical planning scenario.<br>• U18.5.2 Recognize common IT governance structures. | • Care Coordination<br>• HIT Barriers<br>• Strategic Planning |

| Unit 8 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Patient Safety Culture and HIT | • U12.8.1 Apply QI Tools to analyze HIT errors.<br>• U12.8.2 Strategies for HIT initiatives. | • Adaptive Work<br>• QI Tools |

| Unit 9 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Implementation Planning for Quality and Safety | • U12.9.1 Critique an implementation team and the roles they play in ensuring quality.<br>• U12.9.2 Analyze effective implementation planning.<br>• U12.9.3 Assess the quality implications of "big bang" versus "staggered" approaches to activation.<br>• U12.9.4 Discuss "go live" support strategies that minimize risk. | • Implementation Team<br>• Go-Live |

| Unit 10 | Objectives | Key Concepts |
| --- | --- | --- |
| **Title:** Measuring Quality | • U12.10.1 Understand the basic concepts of variation.<br>• U12.10.2 Explain the attributes of an effective reporting system.<br>• U12.10.3 Examine the importance of having standardized and structured health information.<br>• U12.10.4 Discuss how HIT can facilitate data collection and reporting for improving quality of care. | • Patient Safety |

| Unit 11 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Data Quality Improvement | • U12.11.1 Understand different purposes of data.<br>• U12.11.2 Discuss the impact of poor data quality on quality measurement.<br>• U12.11.3 Identify ten attributes of data quality and key process recommendations.<br>• U12.11.4 Explore the attributes of data quality and key processes for maintaining data integrity.<br>• U12.11.5 Discuss common causes of data insufficiency.<br>• U12.11.6 Describe how health information technology design can enhance data quality. | • Use Data<br>• Insufficient Data Quality<br>• Design Recommendations |

| Unit 12 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Learn from Mistakes by Analyzing Reporting Errors | • U12.12.1 Explain how reporting errors can help to identify HIT system issues.<br>• U12.12.2 Describe ways in which HIT can facilitate error reporting and detection.<br>• U12.12.3 Assess HIT for unintended negative consequences.<br>• U12.12.4 Examine common themes in HIT design deficiencies.<br>• U12.12.5 Apply QI tools to examine HIT errors. | • Error Detection<br>• QI Tools |

# Module 6: Terminology in Healthcare

(Module 6 = ONC Component 3)

| Component 3 | Component Objectives |
| --- | --- |
| **Title:** Terminology in Healthcare<br><br>**Description:** This component explains specific terminology used by workers in health care and public health. | • C.3.1 Define, understand and correctly pronounce medical terms related to each of the major body systems.<br>• C.3.2 Define commonly used terms in public health, nursing, health information technology, and clinical vocabularies & terminologies related to the implementation of electronic health records.<br>• C.3.3 Identify the purpose and uses of pertinent health care terminologies in the electronic health record.<br>• C.3.4 Demonstrate the ability to integrate and use health care terminology in the various health information technology roles. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
  - Component Slide Deck Notes or Videos
  - Component Study Guide
  - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 2 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| NEEHR Perfect | Data Entry with note | Beginning documenting skills in the electronic health record focusing on the entering of problems, diagnosis and patient reporting. | 45 minutes | Beginner |
| NEEHR Perfect | Data Entry without a note | Beginning documenting skills in the electronic health record: entering a problem, entering orders and documenting vital signs in a chart. | 45 minutes | Beginner |

*Readings:*

OLI – Module 30, all pages.

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Medical Words | • U3.1.1 Discuss the four parts of medical terms.<br>• U3.1.2 Recognize word roots and combining forms.<br>• U3.1.3 Identify the most common prefixes and suffixes.<br>• U3.1.4 Describe the anatomical positions.<br>• U3.1.5 Define the body planes.<br>• U3.1.6 Identify regions of the body.<br>• U3.1.7 Define directional and positional terms.<br>• U3.1.8 Build, divide, spell and pronounce common medical words. | • Medical terminology<br>• Root, suffix, prefix<br>• Regions of the body |

| Units 2 - 12 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Medical Words | • U3.2-12.1 Define, understand medical terms related to Various Systems of the Body.<br>• U3.2-12.2 Describe common conditions related to Various Systems of the Body. | • Overview of the systems of the body |

| Unit 13 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Public Health | • U3.13.1 Define frequently used public health terms.<br>• U3.13.2 Identify distinguishing features of public health.<br>• U3.13.3 Identify categories and factors that influence health.<br>• U3.13.4 Identify terms commonly used as measures of health status.<br>• U3.13.5 Define frequently used healthcare systems terms.<br>• U3.13.6 Identify and define types of patients in various healthcare settings.<br>• U3.13.7 Identify and define the healthcare professions. | • Public Health Definitions<br>• Services<br>• Professionals |

| Unit 14 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Health Information Management | • U3.14.1 Explain concepts used in the field of Health Information Management and HIT.<br>• U3.14.2 Understand the terms that frame HIM and HIT practice.<br>• U3.14.3 Describe health IT hardware and software.<br>• U3.14.4 Define acronyms and abbreviations. | • HIM<br>• Networks<br>• Data Entry Devices<br>• Acronyms in HIT<br>• Agencies<br>• HITECH<br>• Standard Orgs. |

| Unit 15 | Objectives | Key Concepts |
|---|---|---|
| **Title:** EHRs | • U3.15.1 Identify the function of the health record.<br>• U3.15.2 Describe ARRA the HITECH Act of 2009.<br>• U3.15.3 Define meaningful use (MU).<br>• U3.15.4 Discuss the difference between an EHR, EMR, and PHR.<br>• U3.15.5 Define functional requirements of an electronic health record (EHR).<br>• U3.15.6 Identify the purposes of EHR components.<br>• U3.15.7 Describe methods to ensure data security and confidentiality. | • Functions of the Health Record<br>• Data and Information<br>• Rights of info<br>• Regulations<br>• ARRA<br>• HITECH<br>• MU<br>• RECs |

| Unit 16 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Health Information Exchange Standards | • U3.16.1 Define terms related to standardized terminologies.<br>• U3.16.2 Identify and define HIPAA standard code sets.<br>• U3.16.3 Identify and define terminologies and vocabularies that represent nursing care.<br>• U3.16.4 Define and give examples of data interchange standards. | • Messaging Standards<br>• DICOM<br>• HL7<br>• HIPAA Standard Code Sets<br>• NDC<br>• ICD<br>• HCPCS<br>• Nursing Standards, NAND<br>• NIC, NOC, PNDS<br>• SNOMED CT<br>• LOINC |

# Module 7: Culture of Healthcare

(Module 7 = ONC Component 2)

| Component 2 | Component Objectives |
|---|---|
| **Title:** The Culture of Healthcare<br><br>**Description:** For individuals not familiar with healthcare, this component addresses job expectations in healthcare settings. It discusses how care is organized within a practice setting, privacy laws, and professional and ethical issues encountered in the workplace. | • C2.1 Describe the major types of clinical personnel involved in healthcare and typical roles.<br>• C2.2 Describe the major types of settings in which healthcare occurs.<br>• C2.3 Describe the major processes of information gathering, analysis, and documentation used by clinicians.<br>• C2.4 Give examples and explain the differences between common forms of care delivery.<br>• C2.5 Describe the role of community health and public health in managing outbreaks, epidemics, pandemics.<br>• C2.6 Understand the basic principles of evidence-based practice.<br>• C2.7 Describe common forms of quality measurement, performance improvement, and incentive payments.<br>• C2.8 Discuss the role of medical ethics and professional values in care delivery.<br>• C2.9 Understand the concepts underlying the application of privacy, confidentiality, and security. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
  - Component Slide Deck Notes or Videos
  - Component Study Guide
  - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 2 weeks

*Readings:*
OLI - Module 3, all pages / Module 5, all pages / Module 6, all pages

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| NEEHR Perfect | Health Information Terminology Activity | Introduces health information terminology and tests the user's knowledge by documenting in a templated note the answers to 25 questions. | 1 hour 15 min | Beginner |
| NEEHR Perfect | Introducing HITECH and the History of EHRs | Introduction to the HITECH Act, ARRA, IOM, the evolution of electronic health records and how Neehr Perfect incorporates these pieces of healthcare information technology | 1 ½ hours | Beginner |
| NEEHR Perfect | Health Information Exchange | Explores health information exchange, what it is and how it is used. The student will use the HealthIT.gov website, VistA Health Data Systems and apply what they learn to using Neehr Perfect. | 1 ½ hours | Beginner |
| NEEHR Perfect | Introduction to Privacy, Security and Confidentiality in the EHR | Introduction to the basic aspects related to privacy, security and confidentiality for both the consumer and the healthcare worker. | 1 hour | Beginner |

*Readings:*

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Customer Service | • U2.1.1 Define terms used in healthcare: disease, syndrome, etc.<br>• U2.1.2 Describe the education, training, certification, licensure and roles of physicians.<br>• U2.1.3 Describe the education, training, certification, licensure and roles of healthcare workers. | • Cultural Competence<br>• Safety Culture |

| Unit 2 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Healthcare Professionals | • U2.2.1 Define contextual norms expected in healthcare organizations.<br>• U2.2.2 Discuss the importance of dress, deportment, demeanor, and grooming. | • Care Coordinators |

| Unit 3 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Healthcare Settings | • U2.3.1 Explain the various forms of care delivery (primary, specialty, etc.)<br>• U2.3.2 Understand the meaning of "continuum of care".<br>• U2.3.3 Evaluate the similarities and differences of hospital types.<br>• U2.3.4 Describe the various departments and services offered by various facilities.<br>• U2.3.5 Explain the ways in which these departments interact and the services relate.<br>• U2.3.6 Speculate on the information that is created and used by people in healthcare.<br>• U2.3.7 Describe ways in which technology has improved communication. | • Continuum of care<br>• Patient Experience |

| Unit 4 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Healthcare Processes and Decision Making | • U2.4.1 Describe the elements of the 'classic paradigm' of the clinical process.<br>• U2.4.2 List the types of information used by clinicians when they care for patients.<br>• U2.4.3 Describe the steps required to manage information during the patient interaction.<br>• U2.4.4 List the different formats used to organize clinical information.<br>• U2.4.5 Explain what is meant by the 'hypothetico-deductive' reasoning process.<br>• U2.4.6 Explain the difference between observations, findings, syndromes, and diseases.<br>• U2.4.7 Describe techniques or approaches used by clinicians to reach a diagnosis.<br>• U2.4.8 List the major types of factors that clinicians consider when devising a management plan. | • Diagnosis and Findings<br>• Classic Paradigm |

| Unit 5 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Evidence Based Medicine (EBM) | • U2.5.1 Define the key tenets of evidence-based medicine (EBM).<br>• U2.5.2 Understand EBM for intervention studies.<br>• U2.5.3 Discuss the benefits and limitations to summarizing evidence.<br>• U2.5.4 Describe how to implement EBM in clinical settings through clinical practice guidelines. | • EBM<br>• Prognosis and Diagnosis<br>• Summarizing Evidence |

| Unit 6 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Nursing Care Processes | • U2.6.1 Learn what nurses do and how they are trained (Lecture a)<br>• U2.6.2 Learn how nurses make clinical decisions and assess patients (Lecture b)<br>• U2.6.3 Learn about the settings where nurses work (Lecture a, c)<br>• U2.6.4 Learn about the procedures that nurses perform (Lecture c) | • Nursing Roles and Responsibilities<br>• Documenting Procedures |

| Unit 7 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Quality Measurement and Performance | • U2.7.1 Define healthcare quality and the major types of quality measures.<br>• U2.7.2 Describe the current state of healthcare quality in the United States.<br>• U2.7.3 Discuss the current healthcare quality measures used in various healthcare settings.<br>• U2.7.4 Describe the role of information technology in measuring and improving healthcare quality<br>• U2.7.5 Describe the results of current healthcare quality efforts in the US. | • Quality Measures<br>• Quality Assessment |

| Unit 8 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Ethics and Professionalism | • U2.8.1 Provide an orientation to ideas about medical ethics and professionalism.<br>• U2.8.2 Explore the relationships among ethical ideals, professionalism, and legal duties.<br>• U2.8.3 Apply the general principles of ethics and professionalism to specific topics.<br>• U2.8.4 Examine ethical issues in health informatics. | • Medical Ethics<br>• Health Informatics |

| Unit 9 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Privacy and Security | • U2.9.1 Define and discern the differences between privacy, confidentiality, and security.<br>• U2.9.2 Discuss the major methods for protecting privacy and confidentiality.<br>• U2.9.3 Describe and apply privacy, confidentiality, and security under the tenets of HIPAA Privacy.<br>• U2.9.4 Describe and apply privacy, confidentiality, and security under the tenets of the HIPAA Security. | • HIPAA<br>• Privacy and Confidentiality |

| Unit 10 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Sociotechnical Aspects | • U2.10.1 Describe the concepts of medical error and patient safety.<br>• U2.10.2 Discuss error as an individual and as a system problem.<br>• U2.10.3 Compare and contrast social and technical "resistance to change".<br>• U2.10.4 Discuss the challenges inherent with adapting work processes to new technology.<br>• U2.10.5 Discuss the downside of adapting technology to work practices and why this is not desirable.<br>U2.10.6 Discuss the impact of changing sociotechnical processes on quality, efficiency, and safety. | • Medical Errors<br>• Patient Safety<br>• Sociotechnical Aspects of Healthcare |

# Module 8: Working with HIT Systems

(Module 8 = ONC Component 7)

| Component 7 | Component Objectives |
|---|---|
| **Title:** Working with HIT Systems<br><br>**Description:** Students will work with simulated systems or real systems with simulated data. As they play the role of practitioners using these systems, they will learn what is happening "under the hood." They will experience threats to security and appreciate the need for standards, high levels of usability, and how errors can occur. Materials must support hands-on experience in computer labs and on-site in health organizations. | • C7.1. Identify common components of an HIT system and types of HIT applications (E-Mar, POE, PACS, ADT, Lab, DSS, Registries, Billing/Coding, and acute care, community health, public health, small provider practices, etc.)<br>• C7.2. Describe data flows across HIT systems and implication of standards.<br>• C7.3. Identify root causes of HIT-induced error (i.e. usability, workflow interference, system error, etc.) and suggest solutions.<br>• C7.4. Assess the strengths and weaknesses of identified solutions to identified HIT problems (to emphasize the reality of "solutions" and illustrate the frequent domino effect/unintended consequences of change of an HIT system)<br>• C7.5. Defines usability, describes general usability principles, and relates usability to adoption in relation to HIT. |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
    - Component Slide Deck Notes or Videos
    - Component Study Guide
    - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 2 weeks

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |
| NEEHR Perfect | Chart Abstracting | Student abstracts the contents of an electronic health record. Substantial knowledge of the details of each tab and the location of information in the patient chart is necessary to complete this activity in a timely manner. | 1 ½-2 hours | Intermediate |
| NEEHR Perfect | Reporting in the EHR | Utilizing the report functions in the EHR to query patient information. | 1 hour | Intermediate |
| NEEHR Perfect | Retrieval of Data | Involves data retrieval within the electronic health record focusing on finding key information from a patient's chart to be used in a research study. The activity uses the chart of Susan Bowers. | 45 minutes | Intermediate |

| Unit 1 | Objectives | Key Concepts |
|---|---|---|
| **Title:** HIT System Components | • U7.1.1 Define a system and relate systems concepts to HIT<br>• U7.1.2 Discuss specific examples of settings where Health IT is used (acute, rural, public health, clinic, office, patient home, etc.)<br>• U7.1.3 Identify common components of a clinical HIT system<br>• U7.1.4 Demonstrate beginning level competency in maneuvering the demonstration EHRS | • Understanding Systems - Conceptualizing HIT Use<br>• HIT Systems<br>• Big Picture of HIT Systems<br>• Common Aspects of Clinical HIT Systems |

| Unit 2 | Objectives | Key Concepts |
|---|---|---|
| **Title:** HIT Functions | • U7.2.1 Identify the health IT functions that support a generic ambulatory patient care process.<br>• U7.2.2 Identify the health IT functions that support a generic inpatient care process. | • Inpatient and Ambulatory<br>• Supporting Care Processes using HIT |

| Unit 3 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Information Exchange | • U7.3.1 Identify common elements of the HIT system.<br>• U7.3.2 Explain the need for standards and why they exist.<br>• U7.3.3 Define and differentiate between messaging standards and terminology standards.<br>• U7.3.4 Compare current efforts to facilitate health information exchange between providers, communities, regions, & nation. (A basic level – eHealthExchange, HIEs, etc.) | • Types of Exchange<br>• Exchange and Meaningful Use<br>• Standard Types<br>• Initiatives of HIE |

| Unit 4 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Effective Systems in HIT | • U7.4.1 Identify characteristics of an effective HIT system.<br>• U7.4.2 Define and provide examples of how evidence-based practice can be supported in HIT Systems.<br>• U7.4.3 Define and cite examples of usability / configurability / scalability and reliability in HIT Systems.<br>• U7.4.4 Contrast different types of reports/queries required for internal and external reporting. | • Characteristics of Effective HIT<br>• Supporting Workflows |

| Unit 5 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Usability | • U7.5.1 Define usability in relation to HIT systems.<br>• U7.5.2 Explain the impact of HIT usability on user satisfaction.<br>• U7.5.3 Provide alternatives to HIT usability bottlenecks. | • User Centered design<br>• Poor Usability<br>• Bottlenecks |

| Unit 6 | Objectives | Key Concepts |
|---|---|---|
| **Title:** HIT Facilitated Error | • U7.6.1 Explain the concept of facilitated error in HIT.<br>• U7.6.2 Cite examples of situations where HIT systems could increase the potential for user error.<br>• U7.6.3 Analyze sources of HIT facilitated errors and suggest realistic solutions. | • Error in Healthcare<br>• Error Vocabulary<br>• Technology Induced Error |

| Unit 7 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Privacy, Security and Confidentiality | • U7.7.1 Explain and illustrate privacy, security, and confidentiality in HIT settings.<br>• U7.7.2 Identify common threats encountered when using HIT.<br>• U7.7.3 Formulate strategies to minimize threats to privacy, security, and confidentiality in HIT systems. | • Safeguards |

| Unit 8 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Planning, Acquiring, Installing, and Training | • U7.8.1 Conduct a basic user needs analysis for a given example situation<br>• U7.8.2 Create a plan for training users in various practice settings<br>• U7.8.3 Identify several challenges that may emerge during installation and generate solution strategies. | • System Development Process<br>• Business Processes<br>• Training |

| Unit 9 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Installation and Adoption Issues | • U7.9.1 Identify frequently encountered challenges to adoption and implementation of HIT systems<br>• U7.9.2 Design an action plan to address barriers to implementation of an HIT system.<br>• U7.9.3 Propose solutions to common problems in the implementation of HIT systems. | • Reasons for System Failure<br>• Critical factors for Success<br>• Challenges<br>• Strategies |

| Unit 10 | Objectives | Key Concepts |
|---|---|---|
| **Title:** Patient-centered care and HIT | • U10.1.1 Define patient-centered care.<br>• U10.1.2 Suggest HIT-enabled solutions/strategies to enhance patient involvement in healthcare<br>• U10.1.3 Assess the effectiveness of HIT systems in supporting patient-centered care.<br>• U10.1.4 Perform self-assessment of personal beliefs related to HIT and patient-centered care. | • Patient-centered care<br>• Measuring effectiveness of patient care |

| Unit 11 | Objectives | Key Concepts |
|---|---|---|
| **Title:** The Future of HIT | • U11.1.1 Speculate the relationship between HIT and health reform.<br>• U11.1.2 Suggest alternative design for usable & supportive H.IT<br>• U11.1.3 Hypothesize how HIT may intersect with publicly available data to improve health (i.e. point of sale, weather, GIS, foods, etc.).<br>• U11.1.4 Predict avenues of future innovations in HIT. | • Future Designs<br>• Infodemiology |

# Module 9: Meaningful Use

(Module 9 = Component 21, *which is not an official ONC component*)

| Component 21 *(not ONC)* | Component Objectives |
|---|---|
| **Title:** Meaningful Use and The HITECH Act<br><br>**Description:** This component provides a basic overview of The HITECH Act and Meaningful Use requirements for both Eligible Professionals and Eligible Hospitals. This is not an ONC Component. It is a separate component developed by staff members at FDRHPO. | • C.21.1 Explain key elements of The HITECH Act.<br>• C.21.2 Explain the key elements of Meaningful Use.<br>• C.21.3 Know the proper resources to obtain current MU information.<br>• C.21.4 Differentiate between Meaningful Use Stages 1, 2, and 3 and their effect on healthcare organizations. |

| No Units | Objectives | Key Concepts |
|---|---|---|
|  |  |  |

Requirements:
- Access to SUNY Jefferson Online Blackboard: Health IT Course B
  - Component Slide Deck Notes or Videos
  - Component Study Guide
  - Component and Unit Test Questions and Answers
- Account with *NEEHR Perfect* Online Learning EHR
- Account with Practice Fusion free online EHR
- Account with Kareo free online EHR (optional)
- Account with Open Learning Initiative (OLI), health IT course.

Timeline:
- 1 week (and continual throughout the course)

| | Assignment Title | Description | Est. time for Completion | Intended User |
|---|---|---|---|---|
| | Practice Test Questions | Complete all assigned practice questions. | 2 hours | Beginner, Intermediate |