Syllabus

Course Title: **Core Health Informatics**
Course Code: **CHI**

Digital Health CANADA

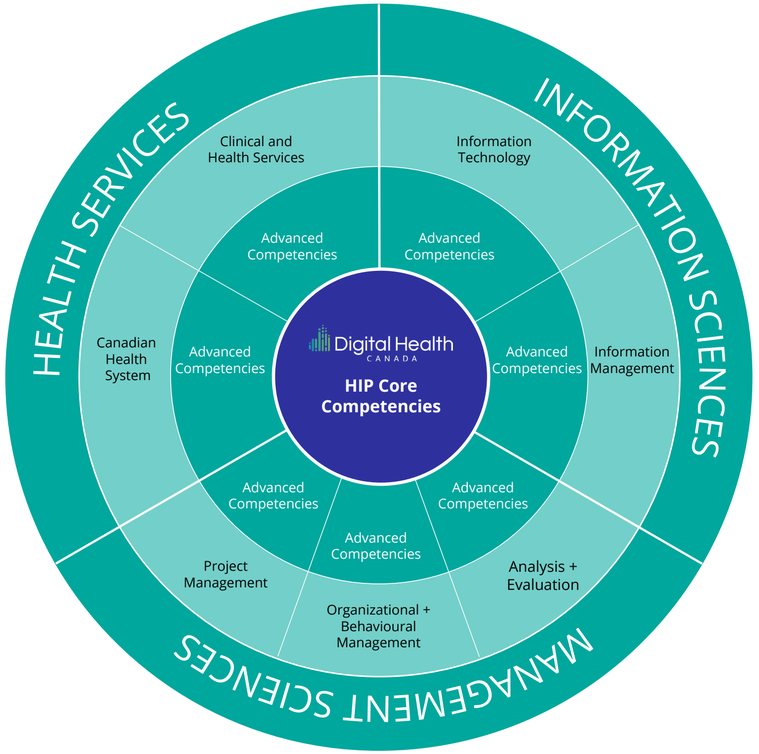
Overview

Digital Health Canada has defined a set of core competencies as a guide for health informatics and digital health professionals. These recommended competencies are divided into seven core areas:

1. The Canadian Healthcare System
2. Clinical and Health Services
3. Information Management
4. Information Technology
5. Analysis and Evaluation
6. Project Management
7. Organizational and Behavioural Management

These seven areas form the basis for the modules and units of Digital Health Canada's Core Health Informatics course outlined in this document.

Who should complete this course?
Emerging professionals, candidates for Certified Professional in Healthcare Information and Management Systems – Canada (CPHIMS-CA) credential, or anyone with an interest in health informatics in the Canadian health system.



Core Health Informatics (CHI) Modules and Units

1	2	3	4	5	6	7
M1 The Canadian Healthcare System	**M2 Clinical and Health Services**	**M3 Information Management**	**M4 Information Technology**	**M5 Analysis and Evaluation**	**M6 Project Management**	**M7 Organizational and Behavioural Management**
CHI101 The Canadian Healthcare System	CHI103 Clinical and Health Services	CHI104 Information Management	CHI106 Information Technology	CHI111 Analysis and Evaluation	CHI112 Project Management	CHI113 Organizational and Behavioural Management
CHI102 The Healthcare Environment		CHI105 Privacy and Security	CHI107 Software Testing and Evaluation			CHI114 HI Leadership and Management
			CHI108 System Design, Selection and Procurement			CHI115 Operations Management
			CHI109 System Analysis and Evaluation			
			CHI110 Implementation, Support and Maintenance			

M1 The Canadian Healthcare System

Module: M1 The Canadian Healthcare System
Unit: CHI101 The Canadian Healthcare System
Duration: One hour

Unit Topics

Legislative Foundations of Canadian Healthcare; Healthcare Governance in Canada; Financing of Healthcare in Canada; Healthcare Spending, Canada Health Infoway; Canadian Institute for Health Information; Canadian Patient Safety Institute; Canadian Institute for Health Research; Canadian Agency for Drugs and Technology in Health; Accreditation Canada, Determinants of Health; Challenges and Issues Facing Healthcare; Sustainability; Health Human Resources, Access and Wait Times for Care; Patient Safety and Quality of Care ; Opportunities and Challenges; Benefits Realization and Evaluation

Unit Objectives

By the end of this unit, learners will be able to:

- Appropriately apply information about Health and health systems in Canada to work products and services, and understand key characteristics of the Canadian health system, determinants of health, and key factors affecting healthcare
- Discuss the challenges related to the adoption and realization of clinical value of information systems in the health sector
- Identify ways to balance the privacy of personal health information with improved care delivery and health system management
- Practice safe and appropriate use of health information technologies to ensure patient safety
- Discuss how HI benefits are realized and measured in the Canadian healthcare system

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M1 The Canadian Healthcare System

Module: M1 The Canadian Healthcare System
Unit: CHI102 The Healthcare Environment
Duration: One hour

Unit Topics

Levels of Care; Clinical Practice Settings; Other Services; Reimbursement for Health Services; Other Organizations; Professional Regulatory Bodies and Associations; Quality Improvement and Accreditation, Covers: Integrated Multi-Disciplinary Care; Care Continuity and Transitions; Population and Public Health; Health Professionals-Regulatory Bodies; Health Professionals - Colleges/Orders; Role and Relationship of Healthcare Professionals; Healthcare Delivery; Healthcare Oversight

Unit Objectives

By the end of this unit, learners will be able to:

- Identify different types of Canadian healthcare delivery models across the continuum of care and their interrelationships
- Recognize the characteristics and services of different types of healthcare organizations
- Describe the roles of governmental, regulatory, professional, and accreditation agencies and their impact on clinical outcomes and financial performance
- Discuss how people, resources and information flow through the health system
- Describe the characteristics of interrelationships within and across healthcare organizations
- Examine the roles and relationships of health professionals along with the organizational and regulatory structure in which they work
- Examine the roles and responsibilities of health professionals and workflow in the environments where they work

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M2 Clinical and Health Services

Module: M2 Clinical and Health Services
Unit: CHI103 Clinical and Health Services
Duration: One hour

Unit Topics

Clinical Transformation; Clinical Workflows; Workflow Management ; Clinical Workflow Analysis, Clinical Documentation Examples; Clinical Record Documentation; Clinical Practice Trends, Software in Health IT; Consumers and Healthcare IT; eSafety; Biomedical Informatics

Unit Objectives

By the end of this unit, learners will be able to:

- Apply knowledge of basic clinical and biomedical concepts, clinical care processes, technologies and workflow for purposes of analysis, design, development and implementation of health information systems and applications
- Understand basic clinical terminology and commonly used abbreviations and acronyms
- Recognize commonly used formats, structures and methods for recording and communicating clinical data and how these are incorporated into system and application use
- Foster the adoption and use of health information systems in clinical settings
- Facilitate appropriate consumer use of health information and communication technologies
- Assess and mitigate clinical safety risks associated with health information and systems throughout the system life cycle
- Facilitate clinicians' use of electronic decision support tools in accessing evidence to support practice

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M3 Information Management

Module: M3 Information Management
Unit: CHI104 Information Management
Duration: One hour + 30 minutes

Unit Topics

Information as a Strategic Resource; Key Attributes of Data and Information; Data Sources; Data Interrelationships and Dependencies, Information Governance; Records Retention; The Canadian Health Information Management Association (CHIMA) Code of Ethics; Health Information Management; AHIMA Information Governance; Key Principles; Standards, Effective Clinical Interoperability; Interoperability Specifications; Pan-Canadian Standards; Interoperability Solutions; Data Quality Assessment

Unit Objectives

By the end of this unit, learners will be able to:

- Advance the management of information as a key strategic resource
- Demonstrate an understanding of the key attributes of data and information (e.g. quality, integrity, accuracy, timeliness, appropriateness) and their limitations within the context of their intended uses
- Determine appropriate data sources and gaps in data sources in relation to identified business needs across the healthcare system
- Demonstrate an understanding of the data interrelationships and dependencies among the various health information systems
- Demonstrate an understanding of the implications of ethical, legislative, and regulatory requirements related to the management of health information
- Apply accepted policies, principles and guidelines for the management of health information
- Employ data management practices
- Demonstrate an understanding of relevant health information standards and their appropriate use
- Apply appropriate health informatics standards and enterprise models to enable system interoperability (e.g., terminology, data structure, system to system communication, privacy, security, safety)
- Integrate data quality principles and methodologies into the identification, use and management of information sources

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M3 Information Management

Module: M3 Information Management
Unit: CHI105 Privacy and Security
Duration: One hour + 15 minutes

Unit Topics

Types of Privacy; Important Definitions; Canadian Standards Association (CSA) Privacy Code, Canadian Health Privacy Legislation; Privacy Roles and Responsibilities; Information Security; Data Management Controls; Security Breaches; Phishing Attacks, Privacy Impact Assessment and Threat Risk Assessment; Threat Risk Assessment (TRA); Developing a Privacy Program; Digital Health Canada Guidelines for the Protection of Personal Health Information

Unit Objectives

By the end of this unit, learners will be able to:

- Apply best practices and solutions required to manage the security of data, systems, devices and networks (e.g. Digital Health Canada Guidelines for the Protection of Health Information) Participate in defining organizational privacy and security requirements, policies and procedures
- Assess privacy and security risks
- Ensure confidentiality, integrity, and availability of data
- Mitigate privacy and security vulnerabilities
- Ensure user access control according to established policies and procedures
- Develop data management controls (e.g., data ownership, criticality, security levels and protections, retention and destruction requirements, access controls)
- Validate disaster recovery and business continuity plans
- Incorporate solution into organizational disaster recovery and business continuity plans
- Coordinate privacy and security audits
- Define organizational roles (e.g., information security, physical security, compliance)
- Discuss different privacy and security risk management tools
- Access business continuity and disaster recovery plans

Supplemental Resources

- Slides with instructor audio
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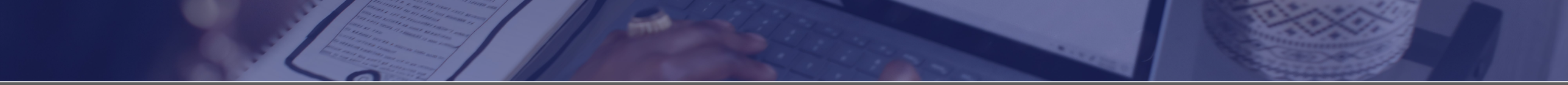

M4 Information Technology

Module: M4 Information Technology
Unit: CHI106 Information Technology
Duration: One hour + 15 minutes

Unit Topics

Introduction to Blockchain technology, processing, security, smart contracts, usage guide and current adoption, Key IT Components; Introductory IT Concepts Applied; Point of Service Systems; Clinical Systems Overview; Selection Process, EHR Solution: The Canadian Vision; Key EHR Components; Trends and Issues; IT Best Practices; Business Continuity

Unit Objectives

By the end of this unit, learners will be able to:

- Demonstrate an understanding of key information technology concepts and components (e.g., networks, storage devices, operating systems, information retrieval, data warehousing, applications, firewalls, etc.)
- Articulate characteristics of technology infrastructure that support the healthcare environment (e.g. network, communications, data integration, privacy and security)
- Articulate characteristics of applications commonly used in healthcare (e.g. clinical, administrative)
- Contribute to the selection and utilization of appropriate information technologies to meet business requirements
- Demonstrate an understanding of architectural relationships between key health information technology components (e.g., the Infoway EHRS blueprint) and best practices in enterprise architecture frameworks/perspectives.
- Analyze future trends in healthcare and technology to anticipate how technology and IT services evolve to meet changing needs
- Evaluate existing and emerging technologies to support organization's future growth and strategy
- Apply information technology best practices (e.g., quality management systems, testing, service level agreements, business continuity and incident management) throughout the system life cycle

Supplemental Resources

- Slides with instructor audio
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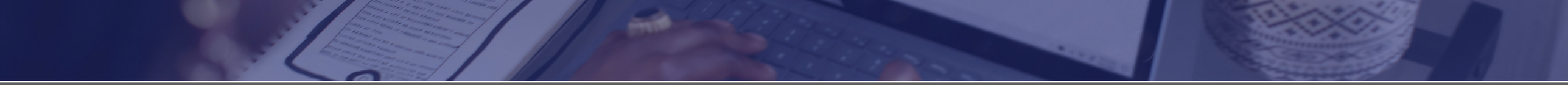

M4 Information Technology

Module: M4 Information Technology
Unit: CHI107 Software Testing and Evaluation
Duration: 30 minutes

Unit Topics

Business Continuity Planning; Disaster Recovery Plans; Why Testing is Necessary; Medical Software and Devices; Level of Software Testing; Definitions; Other Types of Testing; Six Components of Testing Methodology

Unit Objectives

By the end of this unit, learners will be able to:

- Design a formal testing methodology to demonstrate that solutions meet functional requirements (e.g. unit, integrated, stress and acceptance tests)
- Implement internal controls to protect resources and ensure availability, confidentiality and integrity (e.g. security audits,
- Validate implementations against contractual terms and design specifications
- Corroborate that expected benefits are achieved (e.g., return on investment, benchmarks, user satisfaction)
- Validate security features in the evaluation of existing and new systems
- Develop a privacy program
- Test Plan Development, Strategy, Tools and Evaluation

Supplemental Resources

- Slides with instructor audio
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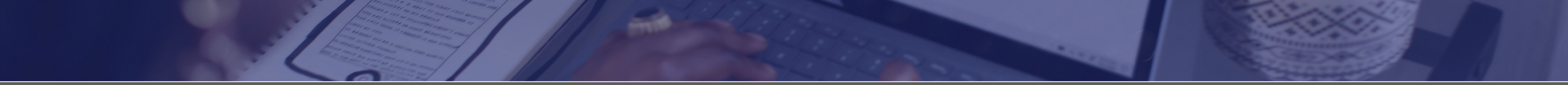

M4 Information Technology

Module: M4 Information Technology
Unit: CHI108 System Design, Selection and Procurement
Duration: One hour + 30 minutes

Unit Topics

Key Components; System Design Considerations; Business Process Management, Factors Affecting the Buy vs. Build Decision; Making a Buy vs. Build Decision; Building a System; Buying a System; Request for Information (RFI); Request for Proposal (RFP); Evaluating an RFP and Awarding the Contract; Adoption of New Technology; Infrastructure Design; Data Management; Infrastructure Specifications

Unit Objectives

By the end of this unit, learners will be able to:

- Identify system designs to accommodate business processes
- Develop requests for information and/or requests for proposals
- Facilitate solution selection criteria
- Select and review team members
- Ensure compatibility of software, hardware, network components, and medical devices
- Ensure compliance with applicable industry, regulatory, and organizational standards
- Ensure a process exists to incorporate industry, technology, infrastructure, legal and regulatory environment trends
- Design an information infrastructure that supports current and anticipated business needs (e.g. business continuity and disaster recovery)
- Conduct solution selection activities (e.g. demonstrations, site visits, reference checks)

Supplemental Resources

- Slides with instructor audio
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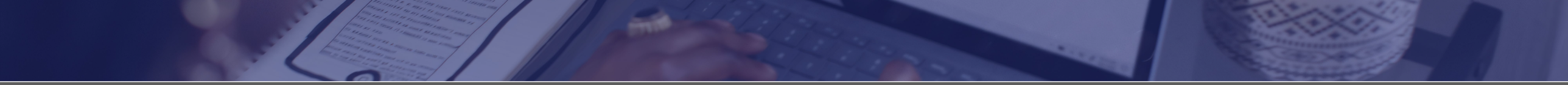

M4 Information Technology

Module: M4 Information Technology
Unit: CHI109 System Analysis and Evaluation
Duration: 40 minutes

Unit Topics

Unit Topics: Technology Lifecycle Management; Engaging Stakeholders; Information Needs; Institute of Medicine; Map Needs to Solutions; Problem Analysis, Needs Assessment; Business Requirements; Needs Prioritization; Alternative Processes and Potential Solutions; Solution Evaluation; Strategic Alignment; Cost-Benefit Analysis; Proposal Development; SWOT Analysis vs. Gap Analysis

Unit Objectives

By the end of this unit, learners will be able to:

- Engage relevant stakeholders at the appropriate stages of the system life cycle.
- Address information, business, and technical requirements to meet the full range of stakeholders' information needs.
- Define the problem or opportunities
- Conduct a needs analysis
- Define requirements
- Prioritize requirements
- Apply knowledge of health data, information and workflow models to information technology solutions
- Analyze current business and clinical processes (e.g., process mapping, flow diagramming, gap analysis)
- Formulate alternate processes and potential solutions
- Evaluate if a proposed solution aligns with the organization's strategic and operational plans
- Perform cost-benefit analysis to evaluate impact on issues related to healthcare systems
- Develop proposals that include recommended approaches and solutions, and plans for realizing benefits
- Perform gap analysis to evaluate where current systems can be enhanced

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

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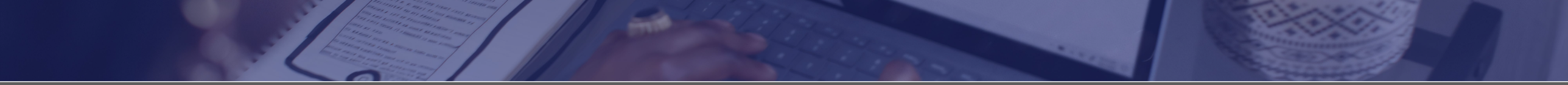
M4 Information Technology
CHI106 Information Technology
CHI107 Software Testing and Evaluation
CHI108 System Design, Selection and Procurement
CHI109 System Analysis and Evaluation
CHI110 Implementation, Support and Maintenance



M4 Information Technology

Module: M4 Information Technology
Unit: CHI110 Implementation, Support and Maintenance
Duration: 20 minutes

Unit Topics

Unit Topics: Documentation; Training and Support; Go-Live; Implementation; Testing and Integration; Maintenance and System Support; Downtime Procedures

Unit Objectives

By the end of this unit, learners will be able to:

- Provide knowledge transfer through user and operational manuals and training
- Execute the implementation of solutions
- Integrate systems to support business requirements
- Manage healthcare information systems (e.g., operate, upgrade
- Analyze data for problems and trends (e.g., error reports, help desk logs, surveys, performance metrics, network monitoring)
- Prioritize issues to ensure critical functions are repaired, maintained, or enhanced
- Develop system and personnel downtime procedures

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M5 Analysis and Evaluation

Module: M5 Analysis and Evaluation
Unit: CHI111 Analysis and Evaluation
Duration: 20 minutes

Unit Topics

Trends and Issues in Analytics; Health System Use; Types of Data Analysis, Presenting and Communicating Health Information

Unit Objectives

By the end of this unit, learners will be able to:

- Identify and frame information queries in collaboration with stakeholders in order to meet their needs for analysis and interpretation of data
- Identify relevant sources of data and information in order to assess the quality of information, and draw appropriate conclusions
- Demonstrate an understanding of appropriate analytical and evaluation techniques and concepts (e.g., qualitative and quantitative methods, basic statistical and epidemiological techniques, indicators and evaluation measures)
- Demonstrate knowledge of indicators and metrics for healthcare delivery and systems management
- Contribute to quality analysis by organizing and transforming data into reliable and meaningful information for diverse audiences
- Present data and information in a way that is effective for users
- Present information and concepts using audience-appropriate communication and language
- Present interpretations and recommendations of data analyses to decision makers

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M6 Project Management

Module: M6 Project Management
Unit: CHI112 Project Management
Duration: 15 minutes

Unit Topics

Five Phases of Project Management; Nine Project Management Knowledge Areas

Unit Objectives

By the end of this unit, learners will be able to:

- Apply project management principles and best practices (e.g. project charter, scope, life cycle, budgets, resourcing, timelines, milestones, monitoring, status reports)
- Work collaboratively and contributes to project planning, implementation, monitoring and evaluation
- Manage projects and/or resources, including: assessing resource requirements (e.g., space, personnel, environmental, communication, productivity), utilizing project management skills and tools, conducting a risk assessment, facilitating project status and business value assessments, facilitating change management, controlling scope, schedule, and budget of project, maintaining project materials and documentation and developing implementation strategies
- Anticipate issues and opportunities and mitigates risks associated with projects

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M7 Organizational and Behavioural Management

Module: M7 Organizational and Behavioural Management
Unit: CHI113 Organizational and Behavioural Management
Duration: One hour

Unit Topics

Basic Theories, Concepts and Practices of Management; Ethics; Organizational Strategy, Behaviour and Culture; Electronic Health; A Transformation - Facilitating Learning and Development; Adult Learning Concepts; Adoption and Maturity Models; Ongoing Evaluation of Systems, What is Change Management; Challenges in eHealth: Value of Change Management: Techniques to Support Solution Implementation; Roles and Groups; Stakeholder Engagement and Categorization, Overview of Workflow Analysis and Integration; Common Steps to Workflow Mapping; Clinical Workflow Analysis; Communications; Stakeholder Strategy; Training and Education; Monitoring and Evaluation; Breaking Down Barriers

Unit Objectives

By the end of this unit, learners will be able to:

- Apply the basic theories, concepts and practices of management
- Contribute to organizational plans and strategies; Promotes an information culture
- Facilitate self, individual, team and organizational learning and development
- Assure staff competency in information and management systems skills
- Apply best practices in quality improvement and process engineering
- Contribute to ongoing evaluation of the functionality of systems
- Apply best practices of change management
- Employ organizational change management techniques in support of solution implementation
- Promote and apply problem solving and quality improvement methodologies, analytical tools to optimize systems function, organizational change management techniques
- Integrate Digital Health Canada's ethical principles into daily practice

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M7 Organizational and Behavioural Management

Module: M7 HI Leadership and Management
Unit: CHI114 HI Leadership and Management
Duration: One hour

Unit Topics Organizational Leadership Roles; Organizational Strategic Planning; IT Strategic Planning; Performance Monitoring; Operations; Quality Indications and Tools; Effectiveness and User Satisfaction, Policy and Procedures; Legal/Regulatory and Organizational Standards; Ethics; Operational Performance Comparative Analysis Strategies; Business Communications; Risk Management; Education Strategies for IM/IT; Quality Standards and Practices; IT Management Best Practices

Unit Objectives (HI Leadership)
By the end of this unit, learners will be able to:
- Participate in organizational strategic planning (e.g., measure performance against organizational goals
- Assess the organizational environment (e.g., corporate culture, values, and drivers)
- Forecast technical and information needs of an organization by linking resources to business needs
- Develop an IT strategic plan and departmental objectives that align and support organizational goals and strategies
- Evaluate performance (e.g., goal/performance indicators, systems effectiveness)
- Evaluate effectiveness and user satisfaction of systems and services
- Promote stakeholder understanding of information technology opportunities and constraints (e.g., business and IT resources, budget, project prioritization)

Unit Objectives (Management)
By the end of this unit, learners will be able to:
- Develop policies and procedures for information and systems management
- Understand legal and regulatory standards compliance
- Practice ethical business principles
- Analyze comparative analysis strategies (e.g., indicators, benchmarks)
- Prepare and deliver business communications (e.g., presentations, reports, project plans)
- Facilitate group discussions and meetings (e.g., consensus building, conflict resolution)
- Provide consultative services to the organization on IT matters
- Develop educational strategies regarding the information and management systems function
- Maintain organizational competencies on current IT technologies and trends
- Identify and assess risk management embedded in internal and external management processes and consistent application (e.g., risk assessment and mitigation)

Supplemental Resources
- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*

M7 Organizational and Behavioural Management

Module: M7 HI Operations Management
Unit: CHI115 HI Operations Management
Duration: 30 minutes

Unit Topics

Roles and Responsibilities; Digital Health Canada Career Matrix; Health Informatics Professionals (HIPs); Managing Projects and Portfolios; 5 Phases of Project Management; Integrating Project Management and Change Management; Tools of the Trade; Vendor Management and Relationships; IT Governance and Management; Managing Customer Relationships; Managing Budget and Financial Risks; 4 Steps for Managing Risk

Unit Objectives

By the end of this unit, learners will be able to:

- Differentiate the roles and responsibilities of healthcare information and management systems professionals within the organization structures in which they work
- Define roles, responsibilities, and job descriptions for IT-related functions
- Manage projects and portfolios of projects (e.g., initiate, plan, execute, control, close)
- Manage relationships with vendors (e.g., contract cost, schedule, support, maintenance, performance)
- Facilitate steering committee meetings and/or topics
- Assure adherence to industry best practices (e.g., change control, project management etc.)
- Maintain system, operational, and department documentation
- Provide customer service (e.g., service level management, request tracking, problem resolution)
- Manage budget and financial risks
- Manage customer relationships with business unit leaders

Supplemental Resources

- Slides with instructor audio
- *Resource Guide to Digital Health in Canada*