

NURS-3400: NURSING INFORMATICS AND DATA-DRIVEN CARE

Cuyahoga Community College

Viewing: NURS-3400 : Nursing Informatics and Data-Driven Care

Board of Trustees:

October 2025

Academic Term:

Fall 2026

Subject Code

NURS - Nursing

Course Number:

3400

Title:

Nursing Informatics and Data-Driven Care

Catalog Description:

This course introduces the BSN student to nursing informatics practice, focusing on the transformation of data into information, knowledge, and wisdom. Students will develop skills in workflow and data analysis, alongside proficiency in understanding the relationship between nursing and information technology in evidence-based practice. Students will demonstrate an understanding of current and emerging technologies to improve health, healthcare equity, safety, quality, and outcomes.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

NURS-3100 Transition to Professional Nursing Practice.

Outcomes

Course Outcome(s):

Describe the foundational concepts of nursing informatics to support clinical judgment.

Objective(s):

1. Define nursing informatics and its historical context.
2. Explain the Data-Information-Knowledge-Wisdom (DIKW) framework and its relevance to nursing practice.
3. Identify various career areas within nursing informatics.

Course Outcome(s):

Evaluate patient care data from information systems to identify patterns, monitor quality indicators, and support the differentiation of evidence-based practice and quality improvement initiatives.

Objective(s):

1. Differentiate between structured and unstructured data types in healthcare.
2. Describe methods for manipulating and organizing different data types.
3. Utilize spreadsheet software to explore and work with structured data sets.
4. Explain the role of data analytics in nursing practice.
5. Develop a workflow analysis diagram for a given clinical scenario.

6. Relate workflow analysis to data and data visualization.
7. Relate basic statistical concepts to understanding relationships within data.
8. Analyze how data visualization influences understanding within the DIKW framework.
9. Discuss how data visualization translates to improved patient care

Course Outcome(s):

Demonstrate the use of dynamic healthcare technologies to manage patient information and support safe clinical workflow.

Objective(s):

1. Discuss the potential applications of artificial intelligence (AI) tools in contrasting structured data.
2. Identify data science tools used by nurses for analytics.
3. Analyze datasets using basic data analysis tools (e.g., R) to inform evidence-based nursing practice.
4. Explore different methods and techniques for data visualization.
5. Interpret visual representations of healthcare data.
6. Utilize web-based freeware to create workflow diagrams.
7. Identify gaps in existing workflows and propose solutions through visual representation.

Course Outcome(s):

Analyze the impact of patient-facing health technologies (e.g., telehealth, patient portals, mobile apps) on patient engagement, health literacy, and health promotion.

Objective(s):

1. Investigate patient access to healthcare data, proxy access, and related security/privacy considerations.
2. Explore case studies related to nursing innovation and implementation to identify challenges and opportunities for nurse led change.
3. Identify common challenges and barriers to innovation and technology adoption in healthcare.

Course Outcome(s):

Apply ethical principles and legal standards to the use of health information technology to ensure patient privacy, data confidentiality, and system security.

Objective(s):

1. Examine the policy and legal context of "Open Notes" in healthcare.
2. Analyze the ethical implications of "Open Notes," particularly concerning sensitive health information.
3. Utilize ethical principles (autonomy, beneficence, non-maleficence, justice) in the application of AI in patient care and clinical settings.

Course Outcome(s):

Articulate the role of the baccalaureate-prepared nurse as an essential interprofessional team member in the selection, implementation, and evaluation of healthcare technologies.

Objective(s):

1. Reflect on personal experiences with technology in clinical decision-making, including both supportive elements and barriers.
 2. Discuss opportunities for baccalaureate-prepared nurses in driving innovation and change management.
 3. Reflect on personal growth and understanding of health informatics topics throughout the course.
 4. Articulate how the learned concepts of nursing informatics contribute to professional nursing identity.
 5. Evaluate the role of the baccalaureate-prepared nurse in the ongoing selection, implementation, and evaluation of healthcare technologies.
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Methods of Evaluation:

1. Discussion Boards: Written and Video/Audio
2. Guided Exercises
3. Case Studies
4. Quizzes
5. Self-Evaluation & Reflection assignment

Course Content Outline:

1. Foundations of Nursing Informatics: Data, Information, Knowledge, and Wisdom
 - a. Definition
 - b. Historical context
 - c. Data-Information-Knowledge-Wisdom (DIKW) framework
 - d. Career areas within nursing informatics
 - e. Personal experience with technology
2. Data: Cycle and Structure (Assessment)
 - a. Structured vs unstructured data types in healthcare
 - b. Methods for manipulating and organizing different data types
 - c. Using spreadsheets to work with structured data sets
 - d. Potential applications of artificial intelligence (AI) tools
3. Data Analysis (Diagnosis - Problem & Issue Identification)
 - a. Role of data analytics in nursing practice
 - b. Data science tools used by nurses for analytics
 - c. Application of basic statistical concepts to understand data relationships
4. Information: Data Visualization (Diagnosis - Problem & Issue Identification)
 - a. Data visualization methods and techniques
 - b. Interpretation of visual representations of healthcare data
 - c. How data visualization influences understanding within DIKW framework
 - d. How data visualization translates to improved patient care
5. Information: Workflow Analysis (Planning)
 - a. Workflow analysis diagrams
 - b. Web-based freeware for workflow analysis diagrams
 - c. Relationship of workflow analysis with data and data visualization
 - d. Using visual representation to identify and propose solutions to gaps in existing workflows
6. Knowledge - Patient Advocacy and Ethics
 - a. Policy and legal context of 'Open Notes' in healthcare
 - b. Access to healthcare data
 - i. Patient
 - ii. Proxy
 - iii. Related security/privacy considerations
 - c. Ethical implications of 'Open Notes'
 - d. Ethical principles for application of AI in patient care and clinical settings
 - i. autonomy
 - ii. beneficence
 - iii. non-maleficence
 - iv. justice
7. Wisdom - Implementation and Change Management
 - a. Challenges and opportunities for nurse led change
 - b. Common challenges and barriers to innovation and technology adoption in healthcare
 - c. Opportunities for baccalaureate-prepared nurses in driving innovation and change management
8. Wisdom - Application to Professional Identity (Evaluation)
 - a. Personal growth reflection
 - b. How nursing informatics contributes to professional nursing identity
 - c. Role of baccalaureate-prepared nurse in ongoing selection, implementation, and evaluation of healthcare technologies

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: <https://portal2.tri-c.edu/ReligiousAccommodation/ReligiousAccommodationForm>. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

<https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf>

Weekly Schedule

	Topics
Week 1	Foundations of Nursing Informatics: Data, Information, Knowledge, and Wisdom
Week 2	Foundations of Nursing Informatics: Data, Information, Knowledge, and Wisdom
Week 3	Data: Cycle and Structure (Assessment)
Week 4	Data: Cycle and Structure (Assessment)
Week 5	Data Analysis (Diagnosis - Problem & Issue Identification)
Week 6	Data Analysis (Diagnosis - Problem & Issue Identification)
Week 7	Information: Data Visualization (Diagnosis - Problem & Issue Identification)
Week 8	Information: Data Visualization (Diagnosis - Problem & Issue Identification)
Week 9	Information: Workflow Analysis (Planning)
Week 10	Information: Workflow Analysis (Planning)
Week 11	Knowledge - Patient Advocacy and Ethics
Week 12	Knowledge - Patient Advocacy and Ethics
Week 13	Wisdom - Implementation and Change Management
Week 14	Wisdom - Implementation and Change Management
Week 15	Wisdom - Application to Professional Identify (Evaluation)
Week 16	Final Exam

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings

Carter-Templeton, H., Alexander, S., & Frith, K. *Applied Clinical Informatics for Nurses*. Jones & Bartlett Learning.

Resources for the Instructor

Carter-Templeton, Alexander, S., and Frith, K. (2024) *Applied Clinical Informatics for Nurses*., Jones & Bartlett Learning.

American Nurses Association. (2022) *Nursing: Scope and standards of practice*, American Nurses Association.

McGonigle, D. & Mastrian K. (2023) *Nursing Informatics and the Foundation of Knowledge*, Jones & Bartlett Learning.

Miller, K. & Sewell, J.P. (2025) *Informatics and Nursing: Opportunities and Challenges*, Wolters Kluwer.

Additional Resources for the Instructor

1. <https://www.opennotes.org/> - Open Notes
2. <http://openevidence.com/ask> - Open Evidence
3. <https://gemini.google.com/> - Google Gemini
4. <https://www.ania.org/> - American Nursing Informatics Association

5. <https://amia.org/> - American Medical Informatics Association
6. <https://codeofethics.ana.org/home> - American Nurses Association: Code of Ethics 2025
7. <http://www.nursingdatascience.org/> - Nursing Data Science – Vanderbilt University
8. <https://www.researchallofus.org/> - AllofUs – National Institutes of Health
9. <https://miro.com/> - Miro (Collaboration Platform)

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