

Why Not Advance Health Informatics Education Through Our Colleges?

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Seminar Series Sponsors:



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Conestoga College Institute of
Technology and Advanced Learning

Outline

- Conestoga College ITAL
- History of the program
- Program overview
- Examples of how courses are taught
- Field studies and co-op
- Current developments
- Challenges
- Program reviews and testimonials

Conestoga College

- Rated #1 college in Ontario for 9 straight years
- Institute of Technology and Advanced Learning (ITAL)
- Established in 1967
- 5 campuses: Doon (Kitchener), Waterloo, Guelph, Stratford and Cambridge

Students and Faculty

- Full-time Students: 6,900
- Part-time Students: 38,000
- International student enrolment: more than 400 in full-time programs
- Full-time faculty: 329
- Faculty with post-graduate degrees:
 - Masters: 124
 - Doctorate: 29 (PhD – 24)

Degree Programs at Conestoga

- Collaborative BSc Nursing program (with McMaster University and Mohawk College)
- Bachelor of Business Studies (General) - Accounting Track (with the Odette School of Business, University of Windsor)
- Bachelor of Applied Business (International Business Management)
- B.A.Tech. (Architecture - Project and Facility Management)
- B.A.Tech. (Integrated Advanced Manufacturing Technologies)
- B.A.Tech. (Telecommunications and Computer Technologies)
- B.A. Health Sciences - Health Informatics Management
- All degree programs involve co-op components

History of the Program

- Development started in January 2003
- Program Advisory Committee (PAC)
- Representatives from the industry and academia
- School of Health Information Science (University of Victoria) as an example
- “Pointing the Way: Competencies and Curricula in Health Informatics” document

History of the Program

- Program proposal submitted to the Ministry of Training, Colleges, and Universities in December 2003
- Program coordinator, Yuri Kagolovsky, joined the college in January 2004
- PEQAB Panel review in June 2004
- Ministry approval in December 2004
- Started in August 2005: 13 students
- Professor Stefan Pantazi joined the college in January 2007

Program Basis: “Pointing the Way”

- Created with support from the Federal Government and HEALNet (Health Evidence Applications and Linkage Network - a national Network of Centres of Excellence)
- Based on extensive consultations
- Editors:
 - Prof. Dominic Covvey (University of Waterloo)
 - Dr. David Zitner (Dalhousie University)
 - Dr. Robert Bernstein (University of Ottawa)
- Published in 2001
- Competencies and curricula for different types of health informatics professionals

Types of Health Informaticians

- Applied Health Informatics professionals
- Research and Development Health Informatics professionals
- Clinicians with Health Informatics competence

Program Overview

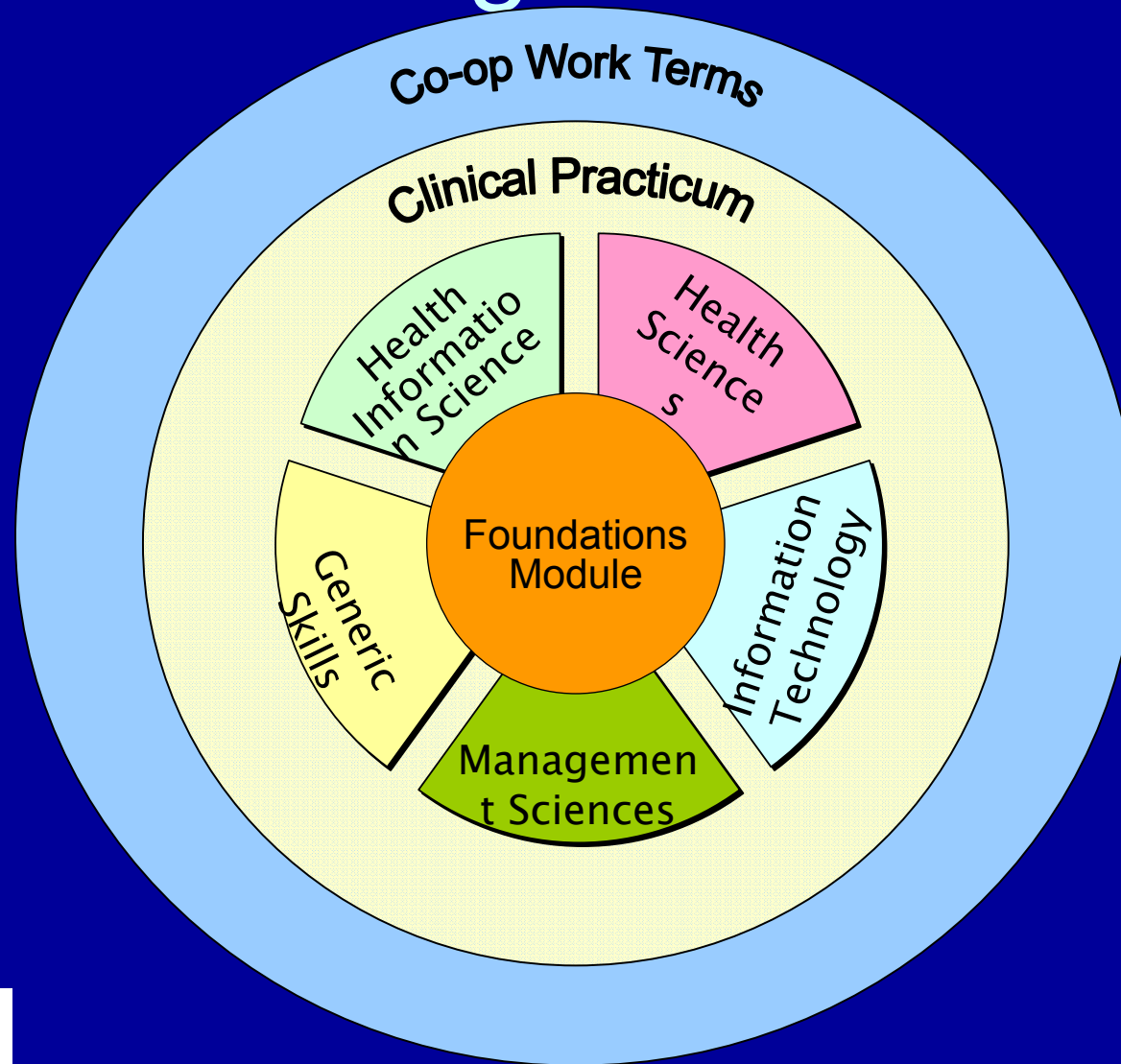
- 4 year co-op program
- Full-time
- Bachelor of Applied Health Sciences Degree
- Prepares business process analysts
- Theoretical rigor of a degree program
- Focus on applied aspects

Our Definition of Health Informatics

“Health informatics is the theory and practice of managing data, information, and knowledge using appropriate information and communication technologies in order to improve health care processes and decision-making to be able to achieve better health of individuals, populations, communities, and society.”

Y. Kagolovsky (Presentation to the QAB Panel, 2004)

Knowledge Domains



THE SEQUENCE OF THE CURRICULUM - HEALTH INFORMATICS MANAGEMENT (INTAKE 2007)

Foundation Module 152 hours	Biology	Effective Communication	Field Trips - Project	End-User Applications (IT)	Science Technology and Society *	Interpersonal and Group Dynamics
F	Mathematics	Health Informatics I	Health Records	Programming Concepts	Science Technology and Society * Hardware Fundamentals	Communication I
W	Health Informatics Field Studies	Communication II	Anatomy and Physiology	Programming with Data Structures	Database Concepts	Humanities, Social Sciences and Sciences
SP	Work Term Opportunity					
F	Interpersonal Conflict Management Skills	Communication III	Health Informatics II	Client/Server Concepts	Database Concepts II: SQL	Humanities, Social Sciences and Sciences
W	Database Concepts III: Information Management	Governance and Structure of Health Care Systems In Canada	Health Care Finance/Public Sector Economics	Systems Analysis & Re Engineering	Clinical Systems	Humanities, Social Sciences and Sciences
SP	Work Term Opportunity					
F	User Training And Adult Education for Health Informatics	Research Methods/Statistics In Health Sciences	Business and Fiscal Management in Health Service	Principles of Systems Design	Building Web Applications	Humanities, Social Sciences and Sciences
W	Work Term Opportunity					
SP	Ethical Reasoning Skills for Health Informatics	Epidemiology, Population Health and Public Health	Management and Organizational Behaviour	Project Management in Health Care - Techniques and Tools	Network Management	Humanities, Social Sciences and Sciences
F	Work Term Opportunity					
W	Clinical Systems II	Decision Support in Health Care	Human Resource Management-Management in Public Administration	Computer Systems Security	Systems Integration	Humanities, Social Sciences and Sciences
SP	Health Informatics III	Health Care Quality Improvement	Change Management	Information Technology Procurement	Information Technology Management	Humanities, Social Sciences and Sciences

LEGEND

INFORMATION TECHNOLOGY	GENERIC	WORK TERM	MANAGEMENT SCIENCES	HEALTH SCIENCES	HUMANITIES AND SOCIAL SCIENCES, AND SCIENCES
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* Note: Science Technology and Society 4 hours in the foundation module and 35 hours in the 1st semester

Foundation Module

- Biomedical terminology
- End-user applications
- Intercultural communication
- True Color testing
- Introduction to co-op, site visits, dress code
- Group Dynamics course
- Site visits

Site Visits

- Grand River Hospital
- Waterloo-Wellington CCAC
- University Health Network
- Courtyard Group
- Agfa HealthCare

Examples of How Courses Are Taught

- Health Informatics I
- Health Records
- Health Informatics II
- Database courses
- Communication courses
- User Training and Adult Education

Health Informatics I and Health Records

- Experimented with different ways of delivery, e.g., course integration
- Case studies
- Textbook: Lorenzi, N.M., Ash, J.S., Einbinder, J., McPhee, W., & Einbinder, L. (Eds.). (2005). *Transforming health care through information* (2nd ed.). New York: Springer.
- Case analysis rubric
- Evaluation rubric

HIM2030 Health Informatics II

- Topics
 - Fundamental concepts in informatics
 - Knowledge representation issues in informatics
 - Theoretical issues in information systems (e.g., electronic health record), communication systems (e.g., computer networks, telehealth, web health services) and decision support systems (e.g., intelligent systems, monitoring systems)
- Textbook
 - Coiera, E. (2003). Guide to Health informatics. Second Edition

Database Courses

- INFO1038 Database Concepts I
 - Fundamental concepts (e.g, RDBMS, database design, normalization)
- PROG2050 Database Concepts II: SQL Programming
 - Theoretical concepts (relational algebra)
 - Comprehensive coverage of SQL
- PROG3410 Database Concepts III: Database and Information Management in Health Informatics
 - barcode technology applications in healthcare
 - barcode automation project
 - report design (Crystal reports)
 - XML-based data management

PROG3410 Project (application)

PROG3410 Project - Computerized Medication Management System

File Help

Diagnosis Medication Allergies

2 of 2

Health Number: 1234

First Name: John

Last Name: Wayne

Picture:

Signature:

Birth Date: 01/01/1920

Gender: male

Address: USA

Primary Contact: sister (519-123-5678)

Date Admitted: 09/03/2007

Attending Physician: Jane Doe

OrderDate	Author	DrugName	DrugDose	DrugForm	DrugRoute	Comments
01/09/2007	Jim Takecare, ...	TAPAZOLE 5M...	5	TABLET (EXTE...	ORAL	test
01/10/2007	Jim Takecare, ...	THEOPHYLLIN...	400	SOLUTION	INTRAVENOUS	test1

Id	IntendedAdministrationD	ActualAdministrationDate	ByEmployee	Comments
15	01/09/2007 12:01 AM			
16	01/09/2007 6:00 PM			
17	01/09/2007 12:00 PM			




PROG3410 Project (reports)

Unit dose labels




Employee badge

26/11/2007 8:49:24AM
Getwell Soon General Hospital
 Cardiology

 Jim
 Takecare
 MD


John	Wayne	12345		
TAPAZOLE 5MG TABL				
	TAPAZOLE 5MG TABLET TABLET (EXTENDED-RELEASE) ORAL	test	DOSE 5	John Wayne male
	TAPAZOLE 5MG TABLET TABLET (EXTENDED-RELEASE) ORAL	test	DOSE 5	John Wayne male
	TAPAZOLE 5MG TABLET TABLET (EXTENDED-RELEASE) ORAL	test	DOSE 5	John Wayne male

Patient bracelet

	John	DOB January 01, 1920		
	Wayne	ADM March 9, 2007 12:00 am		
	male	PRN 26-Nov-2007		

Communication Courses

- 3 courses
- Planned and implemented with HI faculty
- Every assignment is tied to health informatics
- Involve both oral and written skills
- Strong emphasis on intercultural communication
- Evaluation is often done by both faculties

Communication Courses

- Foundations of Communication for HI
 - E-mails, memos, minutes, letters, job search materials
 - Communication theory
 - Presentation skills
 - Using and citing secondary research
- Professional Communication for HI
 - Conducting and using primary and secondary research
 - Report writing: short and formal
- Advanced Communication for HI
 - Creating workplace documentation: user manuals, proposals, system/business requirements documents
 - Presentation and meeting skills

User Training and Adult Education

- Prepares students to develop and deliver training sessions on new technology or new concepts
- Develops abilities to conduct a needs analysis and target training to specific groups
- Develops abilities to accommodate different learning styles and institutional or cultural expectations
- Prepares for different modes of delivery, e.g., in-class, online, via a learning centre

Field Studies

- 1 day a week in a health care organization
- Work related to health informatics
- Weekly written progress reports
- Evaluation by the faculty and preceptors
- Presentations attended by Conestoga faculty, preceptors and program administration

Co-op Component

- 4 co-op opportunities (3 mandatory)
- Co-op preparation
- Employers to-date:
 - Agfa HealthCare Inc.
 - University Health Network
 - Canadian Institute for Health Information
 - Practice Solutions Software Inc.
 - Waterloo-Wellington CCAC
 - St. Mary's General Hospital
 - Medicalis Corporation
 - peopleCare Inc.
 - Whitby Mental Health Centre
 - Grand River Hospital
 - 3M Canada
- Salary: \$2,300-2,600 per month

Program Reviews

- Program Advisory Committee (PAC)
- Students' feedback
- Response to KPI survey
- Faculty consultations
- Co-op employers
- Review by Dr. Zitner (Dalhousie University)

Current Developments

- Degree completion option (advanced standing status)
 - Computer Programmer Analyst Diploma graduates -> 3rd year of HI BAHSc Degree
 - Health Information Management Diploma graduates -> 2nd year of HI BAHSc Degree
- Certificate in Foundations of HI
 - Full-time
 - Part-time

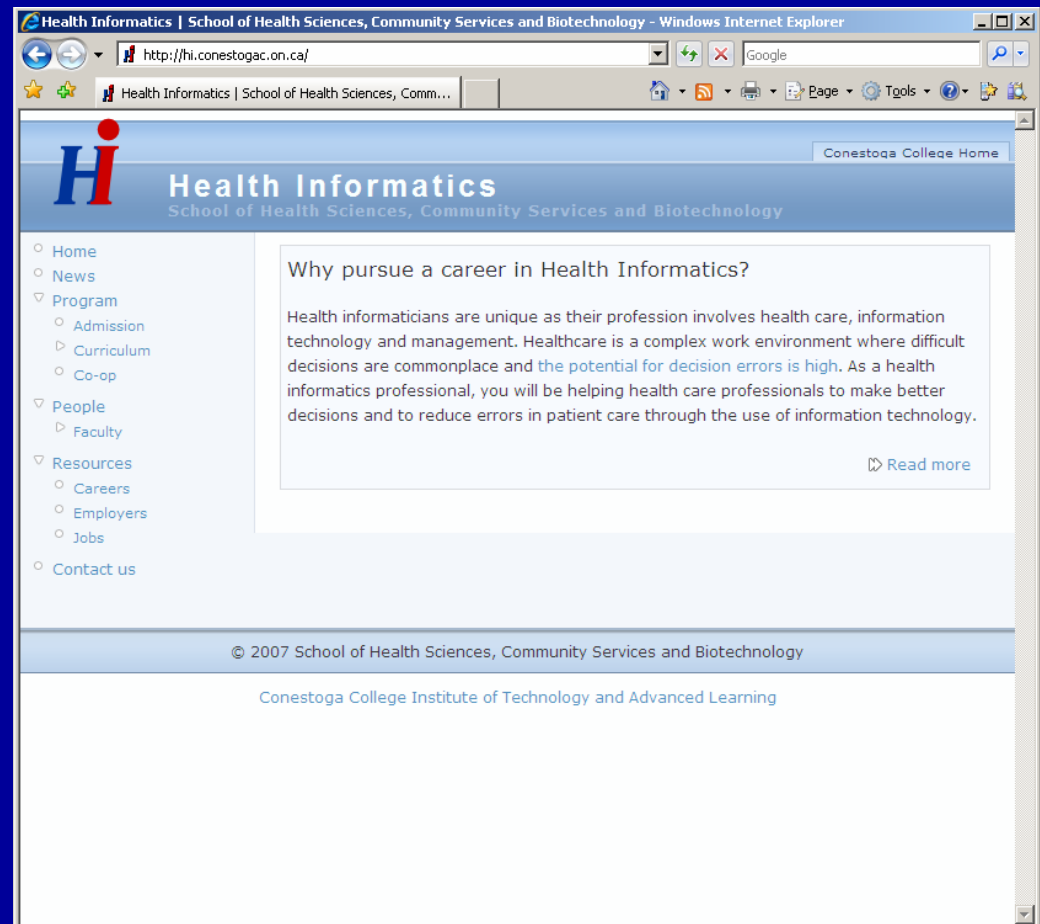
Curriculum Analysis Methodology

- Outcome-based curricula
- Program $\rightarrow \infty$ Knowledge domains $\rightarrow \infty$ Courses $\rightarrow \infty$ **Course Outcomes** $\rightarrow \infty$ Course unit outcomes
- Relational database
- Course outcome match:
 - E.g., use the concepts of probability ~
 - Apply descriptive statistical theory to health care data
 - Calculate statistical measures

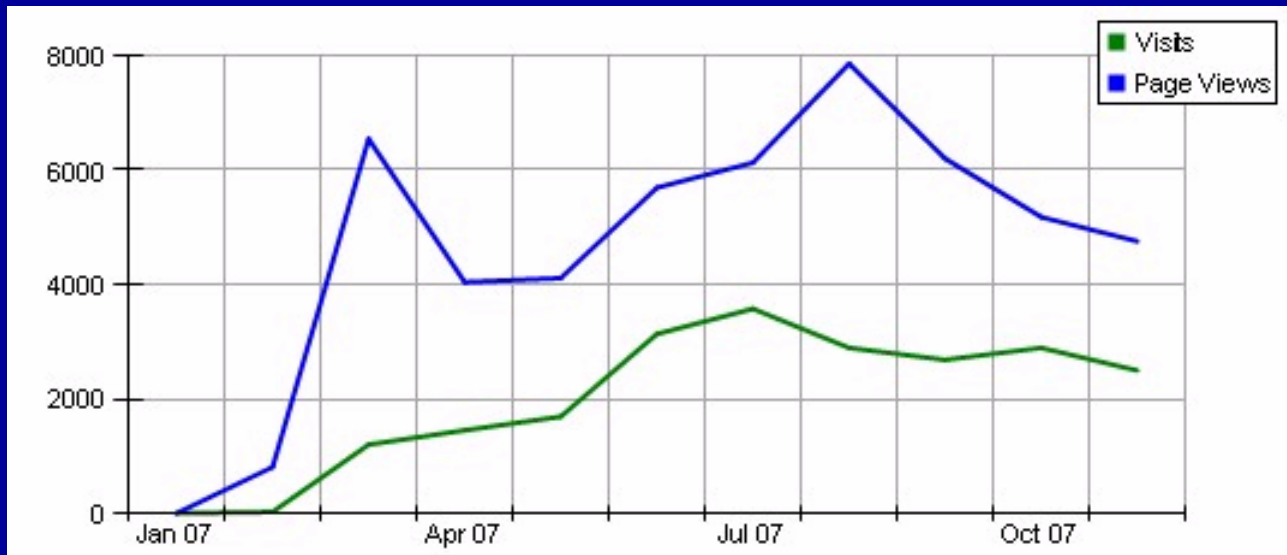
The table is a large grid used for curriculum analysis. It features a header with various categories and a main body of cells. Some cells are shaded, indicating specific data points or matches between course units and outcomes. The table is organized into sections, with the top part containing management and business-related outcomes, and the bottom part containing science and health-related outcomes. The rows represent different course units, and the columns represent specific outcomes or knowledge domains.

Program Web Site

- <http://hi.conestogac.on.ca>
 - Work in progress
 - Simple layout
 - Clean URLs
- Description of program
 - Admission
 - Curriculum
 - Faculty pages
- Repository of job ads
 - main source of hits



Website traffic stats



Dedicated Health Informatics Lab

- Multimedia applications
 - recording, capturing, editing, storing, processing and on-line delivery of streaming video and sound
 - think-aloud protocol recording
 - usability testing and engineering
- Mobile tele-presence, tele-health and robotics
- Digital signal acquisition and processing
- Information systems
 - Barcoding
 - RFID
 - Wireless communication

Challenges

- Public understanding of health informatics
- Program promotion
- Admission criteria

Our Students

- Total: 27 students
- Age range: from 18 to early 40s
- Previous experience:
 - Straight from high school
 - University education
 - Extensive work experience
- Both females and males are represented
- Diverse cultural background

“Conestoga Healthcare Informatics (HI) program is extremely important for us, since it is one of a few programs in Canada which aims to graduate professionals in an extremely promising field...

We are very excited to employ some of the first graduates of Conestoga HI Program, which enables its graduates to be efficient in HI domain the day they finish their education.”

Erkan Akyuz, Chief Technology Officer, AGFA HealthCare

“The work experience component of the Health Informatics Degree Program at Conestoga College has been extremely helpful for peopleCare. Shortly after submitting our job posting, we were able to select from a number of extremely well qualified candidates. The student completed projects our staff would not normally have had time or the experience to complete. We were able to complete our projects at a very reasonable cost given the high caliber of talent utilized. I would definitely recommend the program to others!”

Brent L. Gingerich, Chief Executive Officer, peopleCare Inc.

“...our graduate program executive committee... looks forward to receiving applications for graduate work from qualified graduates of the Conestoga Program.

The Conestoga program as it exists will graduate students who will fulfill a vital role in Canadian and International health care... The program at Conestoga maps well to the applied informatics curriculum. In addition, the Conestoga program has a variety of courses that will contribute to the overall intellectual and human development of Conestoga students.

I wish you well as the program proceeds, grows, and thrives.”

Dr. David Zitner, Professor and Director of Medical Informatics,
Dalhousie University

Thank you

Questions, comments?