



SCHOOL OF INFORMATICS

INDIANA UNIVERSITY
IUPUI

June 28, 2010

Dear Sherry,

We were recently awarded a grant with support from the *American Recovery and Reinvestment Act (ARRA)*. This funding opportunity aims to establish programs that will remain available to train individuals to serve in key health IT professional roles that require university-based training.

In preparation to establish these training programs, we are requesting the approval of the four enclosed graduate certificate programs in Health Informatics. These certificates programs are as follows:

- 1) Certificate in Informatics for Public Health Professionals
- 2) Health Information Systems Programmer and Software Engineer
- 3) Health Information Privacy and Security Specialist
- 4) Health Information Management and Exchange Specialist

We have also enclosed a letter of support from the Department of Public Health.

Sincerely,

Mathew J. Palakal, PhD
Associate Dean, Research & Graduate Programs
Indiana University School of Informatics

Enclosures: Public Health Professionals Document, Health Information Systems Programmer and Software Engineer Document, Health Information Privacy and Security Specialist Document, Health Information Management and Exchange Specialist Document, and Department of Public Health Letter of Support.

Request for a New Graduate Certificate Program
Indiana University School of Informatics
IUPUI

Health Information Management and Exchange Specialist

To be offered as a Indiana University Certificate at IUPUI
August 2010

Purpose of the program

There is a growing need for qualified health IT workers within health care and public health organizations. With many hospital systems and physician practices undergoing rapid transitions from traditional paper-based charting systems to using electronic medical records, digital imaging, and more sophisticated diagnostic systems, it is now essential to have qualified health IT workers who understand these information technologies to assist in their deployment and effective utilization to improve quality and efficiencies within the health care and public health system. This program will increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-based training. This program is initially intended to train applicants to support the collection, management, retrieval, exchange, and/or analysis of information in electronic form, in health care and public health organizations. There are two primary training goals: 1) to provide the coursework necessary to support the collection, management, retrieval, exchange, and/or analysis of information in electronic form, in health care and public health organizations in order to improve health care delivery; and 2) to provide trainees with mentored practicum experiences necessary for their success.

Relation to existing certificate programs

The Health Information Management and Exchange Specialist certificate program will not compete with any other programs at IU. At the same time, the certificate program will leverage the strengths of the undergraduate and graduate degree programs already established in the School of Informatics at IUPUI campuses.

The target audience

This professional, health care and public health-oriented postgraduate certificate program is designed for post-baccalaureate graduates of programs in a healthcare degree program; this program is designed for those who desire specialized training in information systems and storage and retrieval. The program seeks to improve knowledge and education in the Health Information Technology trends as well as health care transformation for the 21st century.

The primary target of this program is graduates who desire to increase their knowledge of HIT systems and to enhance their employment opportunities in health care and public

health organizations. Graduates from the certificate program will enhance their current skill set, allowing them to compete for job positions such as an “EHR Implementation Analyst.” Upon successful completion of the program, the trainee will achieve a fundamental level of understanding of secure biomedical information management and exchange; will have an advanced level of proficiency with respect to coding, classification, and medical terminologies; and will have an advanced level of proficiency with respect to data management, data quality, and data exchange. Certificate-seeking students will receive knowledge and skills that are very hands-on and will help further promote adoption of HIT in the health care and public health professions.

The program consists of 18 credits from which 15 are classes and a three-credit practicum. Nine of the credits are distance accessible courses. The mentored practicum, based at the Regenstrief Institute, provides the opportunity to synthesize the coursework and demonstrate competency in the role of an EHR Implementation Analyst. Students will be able to demonstrate their comprehension, critical thinking, and problem solving abilities alongside faculty and staff in a real-world environment with a proven leader in health information exchange.

Plan for sustaining steady-state enrollment

In the first year (Fall 2010), two students will likely participate in the program. It is anticipated that three students will enroll in year two and four students in year three. The potential exists for much greater growth beyond this subsequently.

New resources

Most courses are currently taught at IUPUI by existing faculty; two new courses are being developed by current faculty based on the e-Health Initiative survey (<http://www.ehealthinitiative.org/ehealth-initiative-releases-results-2009-survey-health-information-exchange.html-0>). These two new courses are Health Information Exchange (INFO I 590) and Security and Privacy Policies and Regulations for Health Care (INFO I 590). However, additional full-time and adjunct faculty will need to be hired if the program grows beyond our current capacity.

Proposed date of the initiation of the certificate program

Proposed date of implementation is Fall 2010, assuming all necessary approvals have been met.

Persons designated as the certificate program head

Dr. Mathew Palakal, Associate Dean for Graduate Studies and Research, Indiana University School of Informatics, IUPUI, will provide the school administrative oversight.

Faculty initially involved in the program and their credentials

Gunther Schadow

Ph.D., Free University Berlin, 1998
Email: gschadow@regenstrief.org

Site: <http://informatics.iupui.edu/people/gshadow>

Work: 317-423-5521

Bio: Gunther Schadow received his MD from Humboldt University, Berlin, Germany and his PhD in Medical Informatics from Free University Berlin, Germany. In 1998, he joined the Regenstrief Institute and Indiana University School of Medicine as a Visiting Associate Scientist and since 2000 as a Medical Information Scientist. Dr. Schadow has been a leader in healthcare information standards for several years. He has developed most of the clinical side of the HL7 version 3.0 information model in collaboration with other HL7 members who represent the key companies, including laboratory and pathology information systems vendors in the medical information system industry. He has also developed a proposed standard for the syntax and semantic of units of measure published in JAMIA, which is now recommended by the U.S. Department for Health and Human Services. He has designed the HL7 version 3 data type specification. He has been co-leading medical device vendors and the FDA on a specification for EKG and other waveform data. He is currently under two contracts with the FDA to design two standards related to drug-knowledge: (1) e-Stability test data submission and (2) Structured Product Labeling (SPL) release 2, which will represent key knowledge in computer-actionable form that can drive decision support functionality in Computerized Physician Order Entry (CPOE) systems. Dr. Schadow has a long-term interest in natural language processing, and he has developed a program that extracts and codes specimens and findings on those specimens from pathology text reports. Dr. Schadow has extensive experience in design and implementation of secure Internet communication using SSL and IPsec, and he has developed a hardware device to support video conferencing to the homes of on-call physicians. Dr. Schadow joined the School of Informatics to develop the Medical Informatics program beginning November, 2004.

Hadi Kharrazi

Ph.D., Candidate Dalhousie University, 2008

Email: Kharrazi@iupui.edu

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Work: 317-278-7668

Bio: Dr. Kharrazi is an Interdisciplinary Medical Informatics Ph.D. Candidate between the faculty of Computer Sciences and the faculty of Medicine at Dalhousie University, Canada. He is a physician and holds a Masters in Health Informatics. He has been a fellow of CHPSTP (Canadian Health Informatics PhD/Postdoc Strategic Training Program) and has won several awards including the prestigious NSHRF and CIHR doctoral awards. Dr. Kharrazi believes that bridging the gaps between medicine and computer sciences requires research in different areas and therefore flexibility in research is an essential characteristic of a medical informatics researcher. His research interests are (but not limited to): patient empowerment and behavioral changes in patients by interactive systems, patient-centered decision support systems, human computer interaction in medicine and web-based personalized patient health records.

Dr. JT Finnell

MD, University of Vermont and MSc, IU School of Medicine

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Work: 317-423-5575

Bio: Dr. Finnell is a Research Scientist, Regenstrief Institute, Inc., Associate Professor of Emergency Medicine for the Indiana University School of Medicine and an Adjunct Professor of Informatics for the Indiana University School of Informatics. Dr. Finnell currently serves as Co-Director for the Regenstrief Institute's Biomedical Fellowship Program, funded by the National Library of Medicine. Regenstrief Institute has had an NLM sponsored Medical Informatics training program since 1996. Dr. Finnell was a faculty mentor previous to becoming co-director of this highly successful training program in 2007. This is an immersive training program. Dr. Finnell currently oversees the training and development of seven individuals in this program. He has been involved in post-graduate education and training since 1995 where he served as Associate Program Director for the Emergency Medicine Training Program in St. Paul, Minnesota.

Dr. Finnell joined the Regenstrief Institute in 2002 where, in addition to his role with the Fellows, his research activities focused on building the infrastructure necessary to capture emergency department visit data. The departmental tracking system known as "WizErD" began capturing visit data on July 15, 2003. His first publication entitled "Community Clinical Data Exchange for Emergency Medicine Patients" explored the pattern of emergency healthcare delivery across Indianapolis over a one-year period. They found that one-fourth of the emergency department patients with more than one visit also visited one of the other five hospital systems. These patients could potentially benefit the most from a shared clinical data network. Dr. Finnell's current research project is working to deliver patient care data, from the local Health Information Exchange, to Tablet PCs EMTs carry in the field, augmenting the data existing in their systems and providing them with information they might not have. He is examining whether this augmented data will allow the EMTs to better care for their patients in the field.

Dr. Josette Jones

Ph.D., University of Wisconsin-Madison, 2002

Email: jofones@iupui.edu

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Work: 317-274-8059

Bio: Josette Jones currently teaches Introduction to Nursing and Health Informatics (Fall), Clinical Information Systems (Fall-Spring), Business of Health Information Technology (Fall) and Social Impact of Information Technology (Spring). Her area of expertise is Nursing Informatics, more specifically tasks analysis and conceptual design of information systems for health care providers and consumers as well. Dr. Jones goals and intentions are to develop a program of research on "tell and ask" functional interfaces" where the user (i.e. nurse, patient, caregiver ...) communicates with a knowledge base by making logical assertions (tell) and posing questions (ask) based on domain specific knowledge representation, its ontologies, and ontological commitments. A knowledge representation embodies an aspect of the reality, believed to be relevant, attending to some features and processes while ignoring others. Ontology – using a wide variety of languages and notations - represents the content attended to, more specifically the description of the concepts and relationships that can exist for an agent or a

community of agents observed. Knowledge representations and their ontologies are developed for the purpose of enabling knowledge sharing and reuse. Ontology, as thus, is a specification used for making ontological commitments. An ontological commitment is an agreement to use a vocabulary and data model in a way that enables information systems to validate and interact with user input conform to domain requirements.

Mathew Palakal

Ph.D., Concordia University, 1987

Email: mpalakal@cs.iupui.edu

Site: <http://informatics.iupui.edu/people/mpalakal>

Work: 317-278-7689

Bio: Dr. Mathew Palakal research interests include Biomedical Text Mining and Intelligent Information Management Systems. Biomedical Text Mining: The biomedical literature databases continue to grow rapidly with vital information that is important for conducting sound biomedical research. BioMap is an attempt to create a scalable knowledgebase of biological relationships extracted from vast amount of biomedical literature data. The development of BioMap system addresses several innovative research issues related to knowledge discovery from literature documents and real-time, interactive access of this knowledge. Specific problems that are being investigated are: discovering explicit, implicit and directional relationships among biological entities from abstracts and full-text documents; discovering both explicit and implicit protein-protein interactions and computationally validating these interactions; and obtaining novel pathways associated with specific diseases in question. Protein-protein, gene-protein, and disease-drug interactions are examples of biological associations that are automatically discovered from a large number of literature documents. BioMap can discover interactions in user-specified biomedical problem domains, such as inflammatory diseases, regenerative biology, cancer, etc. and provide a user-centric view of the knowledge that is discovered. Intelligent Information Management Systems: There is a critical need for innovative information management and knowledge discovery tools to sift through vast volumes of heterogeneous data from various information sources. This project looks into developing Intelligent Software Systems that can integrate information resources and extract embedded knowledge from these information sources.

Alan D. Snell, MD, MMM**St. Vincent Health**

Doctor of Medicine; Indiana University 1976

Masters Medical Management; Tulane University 1999

Email: adsnell@stvincent.org

Phone: 317-402-2943

Bio: Alan Snell, MD currently serves as the Chief Medical Informaticist for St. Vincent Health. He previously practiced Family Medicine in South Bend, IN for over 20 years. Dr. Snell also completed a Master's Degree in Medical Management through the American College of Physician Executives and Tulane University School of Public Health in New Orleans. He has lectured at the IUPUI School of Informatics and accepted interns from the graduate program there. In his current position, he is responsible for

development and implementation of health information technologies including electronic medical records, physician order entry systems and electronic documentation. He has also introduced web-based Personal Health Records to connect St. Vincent patients electronically with their physicians, hospitals, and other providers. Previously, he served as the Chief Medical Information Officer at St. Joseph Regional Medical Center in South Bend for eight years, where he helped develop a community-wide Health Information Exchange and later served as its CEO. He also led efforts to automate over 100 physicians' practices in the South Bend-Mishawaka community.

Roland Gamache

Ph.D., Purdue University and MBA, Indiana University

Email: rgamache@iupui.edu

Site:

Work: 317-423-5575

Bio: Roland Gamache started as an Assistant Research Professor with the School of Medicine at Indiana University in July of 2009. Previously, he was the Director of the State Health Data Center at the Indiana State Department of Health. He worked at the Indiana State Department of Health for eighteen years. His work has focused on the application of public health data analysis in the areas of public health assessment and evaluation, policy development, data systems integration, strategic planning, quality improvement, and public health preparedness activities. He was the Director of the Public Health Preparedness Program at the ISDH for two years during this time. His recent work is in the development of integrated data systems for public health data needs. This work places an emphasis on database design for the improvement of analysis time, integration of public health systems with community-based Health Information Exchanges, and on improving the dissemination of public health information in an effort to measure and improve the health resiliency of the community. He was very active with the Public Health Informatics and Policy Committee of the Association of State and Territorial Health Officials to advance public health informatics policy and the benefits of partnerships with Health Information Exchanges in the community. In this role, he helped develop the list of Competencies for Public Health Professionals in Public Health Informatics. He completed his undergraduate work at the University of Lowell, MA. He received his Ph.D. in Chemistry from Purdue University and his MBA from Indiana University.

Admissions requirements and procedures

General Admission Requirements for the Graduate Certificate in Health Information Management and Exchange Specialist:

Candidates are expected to be post-baccalaureate graduates of programs in a healthcare degree program. Admission is selective: the Trainee Selection Committee evaluates applicants' abilities to succeed academically and their potential to contribute to the program. The certificate degree is designed for post-baccalaureate graduates in an aforementioned discipline who seek professional education in health IT.

Completion requirements and audit and certification procedures:

General Course Requirements: 18 graduate credit hours are required, including:

- Five courses (15 credits)
- Practicum (3 credits)

Specific Requirements

Courses (15 credits)

- INFO I 590 Health Information Exchange
- INFO I 590 Security and Privacy Policies and Regulations for Health Care
- INFO I 530 Foundation of Health Informatics
- INFO I 581 Health Informatics Standards and Terminology
- INFO I 641 Business of Health Informatics

Clinical Informatics Practicum

- INFO I 699 Clinical Informatics Practicum

Total cr. 18

Minimum overall GPA

Successful completion of the certificate requires at least a B average over all courses counting towards the certificate. Courses with a grade of C- or less must be taken again to count towards the certificate. The minimum grade that will be accepted in any single course is C.

Maximum number of credits that can be transferred from another institution

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other certificate programs may request to apply up to a maximum of three credits of these courses toward this certificate. Any waivers or substitutions must be approved by the committee that oversees the program.

Maximum number of undergraduate courses that can be applied

No undergraduate courses can be applied to this certificate program.

Maximum time for completion

All requirements for the certificate must be completed within one year.

Number of credit hours taken prior to admission to the certificate program that may be counted to completion of the degree

Up to 6 equivalent credit hours taken prior to admission to the certificate program, including 3 hours taken from another institution, will be counted towards the certificate.

The rest of the courses must be completed at IUPUI within a one-year period from the time of admission.

Course lists for the program including course descriptions

Health Information Exchange INFO I 590 (3 credits)

This course describes the drivers and challenges, the data and services of electronic health information exchange (HIE). The course illustrates the potential for HIE services to improve efficiency of health care while reducing health care costs.

Foundations of Health Informatics INFO I 530 (3 Credits)

This course will introduce the foundation of Health Informatics. It will review how information sciences and computer technology can be applied to enhance research and practice in healthcare. The basic principles of informatics that govern communication systems, clinical decisions, information retrieval, telemedicine, bioinformatics and evidence based medicine will be explored.

Health Informatics Standards and Terminology INFO I 581 (3 Credits)

Health information is captured as data of various formats and types. If health data is to improve patient care or if research data from different sources need to be joined together, health information standards are needed. Health information standards exist for data types and structures for messages, databases and documents as well as for the nomenclature of the myriad conceptual entities that are relevant for the biomedical domain (terminologies). The field of health information standards is also rapidly evolving. This course gives an overview of the established standards for health care data interchange, and for the rapidly evolving field of biomedical informatics. The course will expose the principles and methodologies underlying most standards and also introduce the student to practical issues of reading and understanding specifications, implementing, and translating between standards.

Security and Privacy Policies and Regulations for Health Care

INFO I 590 (3 Credits)

National standards for transactions, privacy and security of health care information system and patient data, including policy, procedures, guidelines, security architectures, risk assessments, disaster recovery, and business continuity. Particularly, Health Insurance Portability and Accountability Act (HIPAA).

Business of Health Informatics INFO I 641 (3 Credits)

This class focuses on the economic importance of healthcare information technology adoption for value realization, as a strategic asset, as an investment, and transformation toward integrated decision making. Topics covered include but are not limited to implementation of Decision Support System, barcode tracking, Electronic Health Records, pay-for-performance, incentives for e-prescribing.

Clinical Informatics Practicum INFO I 699 (3 Credits)

The Mentored Practicum experience allows trainees to choose a clinical venue in which

to apply their knowledge in a mentored setting.

Program Administration

The program administration is a committee comprised of Drs. Jones, Palakal, Finnell, Snell, and Roland Gamache who jointly oversee the program. All advising will be done by these faculty members. The School of Informatics, IUPUI, will take responsibility for all record keeping and tracking of students.

Procedures for program evaluation including the criteria for success

Upon completion of the Health Information Management and Exchange Specialist certificate program, exit interviews will be conducted for all students to determine the effectiveness of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their professions. Follow-up interviews and surveys will be conducted to ascertain what learned skills they are currently using and if they have a designated professional title in the field of informatics. Given the projected enrollment of this program, and the fact that many of the graduates will remain employed locally, it is anticipated that most students will be tracked this way. Success of the program will be defined in terms of demand (enrollment) and the responses of the students surveyed upon completion of their degree and in the follow-up interviews.

PLANNING FOR LEARNING AND ASSESSMENT

1. What general outcome are you seeking?	2. How would you know it (the outcome) if you saw it? (What will the student know or be able to do?)	3. How will you help students learn it? (in class or out of class)	4. How could you measure each of the desired behaviors listed in #2?	5. What are the assessment findings?	6. How will the aggregated assessment findings be used to improve your program?
<p>Organizational Skills</p> <p>Project Management Skills</p> <p>Technical Skills</p> <p>Data Analysis</p>	<p>Demonstrate and articulate knowledge and skills learned</p> <p>Group participation</p> <p>Prepare reports and give presentations to others</p> <p>Prepare project plans</p> <p>Analyze data and organize into meaningful information</p>	<p>On the job experience</p> <p>Observing professionals in the field</p> <p>Training sessions</p> <p>Design sessions</p> <p>Project management meetings</p>	<p>Observe student presentations and record strengths/weaknesses;</p> <p>Collect observations from those interacting with student</p> <p>Analyze student reports/presentations and recommend improvements</p> <p>Discuss student project plans among professionals for feedback</p> <p>Review student prepared reports and recommend changes as needed</p>	<p>Ability to prioritize tasks within the project;</p> <p>Ability to identify resources needed for the project;</p> <p>Proficiency in information storage and retrieval ;</p> <p>Knowledge of and ability to use large information databases</p>	<p>Survey students at end of course of study. Give feedback to mentors</p> <p>Survey mentors at end of course of study. Give feedback to students.</p> <p>Trend survey results over time and academic periods to measure impact of mentor relationships and changes made</p> <p>Use projects presentations to identify the strengths and weaknesses in their abilities to perform rigorous data analysis and modify our course materials to fill the gaps</p>

Request for a New Graduate Certificate Program
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IUPUI

Health Information Privacy and Security Specialist

To be offered as a Indiana University Certificate at IUPUI
August 2010

Purpose of the program

There is a growing need for qualified health IT workers within health care and public health organizations. With many hospital systems and physician practices undergoing rapid transitions from traditional paper-based charting systems to using electronic medical records, digital imaging, and more sophisticated diagnostic systems, it is now essential to have qualified health IT workers who understand these information technologies to assist in their deployment and effective utilization to improve quality and efficiencies within the health care and public health system. This program will increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-based training. This program is initially intended for training applicants for comprehensive knowledge and skills of security policy, procedures, guidelines, architectures, risk assessments, disaster recovery, and business continuity in both health care and public health organizations.

Participants in this proposed training program will be expected to attain three types of knowledge: 1) general knowledge relevant to Health Information technology; 2) general knowledge relevant to cryptography and information security; and 3) practical knowledge specific to this health care security and privacy subset.

Relation to existing certificate programs

The Health Information Privacy and Security Specialist certificate program will not compete with any other programs at IU. At the same time, the certificate program will leverage the strengths of the undergraduate and graduate degree programs already established in the School of Informatics at IUPUI campuses.

The target audience

This professional, health care and public health-oriented postgraduate certificate program is designed for students who come from baccalaureate-level studies or master level studies. The program seeks to improve knowledge and education in the Health Information Technology trends as well as health care transformation for the 21st century. The primary target of this program is graduates who desire to increase their knowledge of HIT systems and to enhance their employment opportunities in health care and public health organizations. Graduates from the certificate program will enhance their current skill set, allowing them to perform roles of: 1) Information Security Officer; 2) Health

Information Privacy and Security Specialist; 3) Chief Healthcare and Information Privacy & Security Officers (CISO), who can develop, formulate, promulgate, administer, integrate and execute a comprehensive health care and information security program for an organization. Certificate-seeking students will receive knowledge and skills that are very hands-on and will help further promote adoption of HIT in the health care and public health professions.

Plan for sustaining steady-state enrollment

In the first year (Fall 2010), two students will likely participate in the program. It is anticipated that three students will enroll in year two and four students in year three. The potential exists for much greater growth beyond this subsequently.

New resources

This certificate program consists of two new classes, Cryptography and Network Security (CSCI 590) and Security and Privacy Policies and Regulations for Health Care (INFO 590). The other courses are currently taught at IUPUI by existing faculty. However, additional full time and adjunct faculty will need to be hired if the program grows beyond our current capacity.

Proposed date of the initiation of the certificate program

Proposed date of implementation is Fall 2010, assuming all necessary approvals have been met.

Persons designated as the certificate program head

Dr. Mathew Palakal, Associate Dean for Graduate Studies and Research, Indiana University School of Informatics, IUPUI, will provide the school administrative oversight.

Faculty initially involved in the program and their credentials

Dr. JT Finnell

MD, University of Vermont and MSc, IU School of Medicine

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Bio: Dr. Finnell is a Research Scientist, Regenstrief Institute, Inc., Associate Professor of Emergency Medicine for the Indiana University School of Medicine and an Adjunct Professor of Informatics for the Indiana University School of Informatics. Dr. Finnell currently serves as Co-Director for the Regenstrief Institute's Biomedical Fellowship Program, funded by the National Library of Medicine. Regenstrief Institute has had an NLM sponsored Medical Informatics training program since 1996. Dr. Finnell was a faculty mentor previous to becoming co-director of this highly successful training program in 2007. This is an immersive training program. Dr. Finnell currently oversees the training and development of seven individuals in this program. He has been involved

in post-graduate education and training since 1995 where he served as Associate Program Director for the Emergency Medicine Training Program in St. Paul, Minnesota.

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Dr. Josette Jones

Ph.D., University of Wisconsin-Madison, 2002

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Scott Orr

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Bio: Scott Orr is the Network Security and System Administrator in the Department of Computer and Information Science at IUPUI. He teaches Network Administration and Security courses in the Department. He is a technical editor for many books in these fields and has authored several chapters on networking, system administration, and security. He also serves as the IUPUI liaison to USENIX, an organization established in 1975 that brings together scientists, engineers, system administrators, and technicians to develop cutting edge information technologies. Much of his involvement is with the System Administrators Guild (SAGE), a special technical group focusing on all aspects of IT management.

Gunther Schadow

Ph.D., Free University Berlin, 1998

Email: gschadow@regenstrief.org

Site: <http://informatics.iupui.edu/people/gschadow>

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Ph.D., Purdue University and MBA, Indiana University

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Mathew Palakal

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Bio: Dr. Mathew Palakal research interests include Biomedical Text Mining and Intelligent Information Management Systems. Biomedical Text Mining: The biomedical literature databases continue to grow rapidly with vital information that is important for conducting sound biomedical research. BioMap is an attempt to create a scalable knowledgebase of biological relationships extracted from vast amount of biomedical literature data. The development of BioMap system addresses several innovative research issues related to knowledge discovery from literature documents and real-time, interactive access of this knowledge. Specific problems that are being investigated are: discovering explicit, implicit and directional relationships among biological entities from abstracts and full-text documents; discovering both explicit and implicit protein-protein interactions and computationally validating these interactions; and obtaining novel pathways associated with specific diseases in question. Protein-protein, gene-protein, and disease-drug interactions are examples of biological associations that are automatically discovered from a large number of literature documents. BioMap can discover interactions in user-specified biomedical problem domains, such as inflammatory diseases, regenerative biology, cancer, etc. and provide a user-centric view of the knowledge that is discovered. Intelligent Information Management Systems: There is a critical need for innovative information management and knowledge discovery tools to sift through vast volumes of heterogeneous data from various information sources. This project looks into developing Intelligent Software Systems that can integrate information resources and extract embedded knowledge from these information sources.

Alan D. Snell, MD, MMM

St. Vincent Health

Doctor of Medicine; Indiana University 1976

Masters Medical Management; Tulane University 1999

Email: adsnell@stvincent.org

Phone: 317-402-2943

Bio: Alan Snell, MD currently serves as the Chief Medical Informaticist for St. Vincent Health. He previously practiced Family Medicine in South Bend, IN for over 20 years. Dr. Snell also completed a Master's Degree in Medical Management through the American College of Physician Executives and Tulane University School of Public Health in New Orleans. He has lectured at the IUPUI School of Informatics and accepted interns from the graduate program there. In his current position, he is responsible for development and implementation of health information technologies including electronic medical records, physician order entry systems and electronic documentation. He has also introduced web-based Personal Health Records to connect St. Vincent patients electronically with their physicians, hospitals, and other providers. Previously, he served as the Chief Medical Information Officer at St. Joseph Regional Medical Center in South Bend for eight years, where he helped develop a community-wide Health Information Exchange and later served as its CEO. He also led efforts to automate over 100 physicians' practices in the South Bend-Mishawaka community.

Admissions requirements and procedures

General Admission Requirements for the Graduate Certificate in Health Information Privacy and Security Specialist:

Admission is selective: the Trainee Selection Committee evaluates applicants' abilities to succeed academically and their potential to contribute to the program. The certificate degree is designed for students with a baccalaureate or master level degree who seek professional education in health IT.

Completion requirements and audit and certification procedures:

General Course Requirements: 18 graduate credit hours are required, including:

- Five courses (15 credits)
- Practicum (3 credits)

Specific Requirements

Courses (15 credits)

- | | |
|--------------|---|
| • CSCI N 321 | System and Network Administration |
| • CSCI 590 | Cryptography and Network Security |
| • INFO I 535 | Clinical Information Systems |
| • INFO I 581 | Health Informatics Standards & Terminology |
| • INFO I 590 | Security and Privacy Policies and Regulations for Health Care |

Clinical Informatics Practicum

- INFO I 699 Clinical Informatics Practicum

Total cr. 18

Minimum overall GPA

Successful completion of the certificate requires at least a B average over all courses counting towards the certificate. Courses with a grade of C- or less must be taken again to count towards the certificate. The minimum grade that will be accepted in any single course is C.

Maximum number of credits that can be transferred from another institution

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other certificate programs may request to apply up to a maximum of three credits of these courses toward this certificate. Any waivers or substitutions must be approved by the committee that oversees the program.

Maximum number of undergraduate courses that can be applied

This Certificate program will allow one undergraduate-level course in System and Network Administration.

Maximum time for completion

All requirements for the certificate must be completed within one year.

Number of credit hours taken prior to admission to the certificate program that may be counted to completion of the degree

Up to 6 equivalent credit hours taken prior to admission to the certificate program, including 3 hours taken from another institution, will be counted towards the certificate. The rest of the courses must be completed at IUPUI within a one-year period from the time of admission.

Course lists for the program including course descriptions

System and Network Administration CSCI N 321 (3 Credits)

Fundamental concepts of system administration. Design and administration of network servers and workstations. Focus on basic network concepts, such as user account administration, resource allocation, security issues, and Internet service management. Beside lectures, projects and laboratory will be highly included in this course.

Cryptography and Network Security CSCI 590 (3 Credits)

This is an introductory level course on the concepts and principles of cryptography and network security, including classical and modern cryptography, cryptanalysis, secret key cryptosystems, public key cryptosystems, digital signature and authentication, hash

functions and message digest, key distribution and key management, and network security protocols. The focus of this class is on practical aspects and application of cryptosystems and security protocols in network systems such as the Internet.

Clinical Information Systems **INFO I 535** **(3 Credits)**

Clinical Information Systems includes human computer interface and systems design; health care decision support and clinical guidelines; system selection; organizational issues in system integration; project management for information technology change; system evaluation; regulatory policies; impact of the Internet; economic impacts of e-health; and distributed health care information technologies and future trends.

Health Informatics Standards & Terminology **INFO I 581** **(3 Credits)**

Health information is captured as data of various formats and types. This course gives an overview of established standards for health care data interchange. The course will expose the principles and methodologies underlying most standards and introduce students to practical issues of reading and understanding specifications, implementing, and translating between standards.

Security and Privacy Policies and Regulations for Health Care

INFO I 590 **(3 Credits)**

National standards for transactions, privacy and security of health care information system and patient data, including policy, procedures, guidelines, security architectures, risk assessments, disaster recovery, and business continuity. Particularly, Health Insurance Portability and Accountability Act (HIPAA).

Clinical Informatics Practicum **INFO I 699** **(3 Credits)**

The Mentored Practicum experience allows trainees to choose a clinical venue in which to apply their knowledge in a mentored setting.

Depending on the venue chosen, this practical experience includes: 1) working alongside faculty/staff from the Indiana School of Medicine and Regenstrief electronic health care systems; 2) developing and integrating security and privacy policies in real health care systems; 3) participating in privacy/security projects that involve the Marion County Public Health Department; or 4) involvement in one of the many funded research groups with projects underway across the broad spectrum of clinical, public health, and health informatics.

Program Administration

The program administration is a committee comprised of Drs. Jones, Palakal, Finnell, Snell, and Roland Gamache who jointly oversee the program. All advising will be done by these faculty members. The School of Informatics, IUPUI, will take responsibility for all record keeping and tracking of students.

Procedures for program evaluation including the criteria for success

Upon completion of the Health Information Privacy and Security Specialist certificate program, exit interviews will be conducted for all students to determine the effectiveness

of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their professions. Follow-up interviews and surveys will be conducted to ascertain what learned skills they are currently using and if they have a designated professional title in the field of informatics. Given the projected enrollment of this program, and the fact that many of the graduates will remain employed locally, it is anticipated that most students will be tracked this way. Success of the program will be defined in terms of demand (enrollment) and the responses of the students surveyed upon completion of their degree and in the follow-up interviews.

PLANNING FOR LEARNING AND ASSESSMENT

1. What general outcome are you seeking?	2. How would you know it (the outcome) if you saw it? (What will the student know or be able to do?)	3. How will you help students learn it? (in class or out of class)	4. How could you measure each of the desired behaviors listed in #2?	5. What are the assessment findings?	6. How will the aggregated assessment findings be used to improve your program?
<p>Organizational Skills</p> <p>Project Management Skills</p> <p>Technical Skills</p> <p>Data Analysis</p>	<p>Demonstrate and articulate knowledge and skills learned</p> <p>Group participation</p> <p>Prepare reports and give presentations to others</p> <p>Prepare project plans</p> <p>Analyze data and organize into meaningful information</p>	<p>On the job experience</p> <p>Observing professionals in the field</p> <p>Training sessions</p> <p>Design sessions</p> <p>Project management meetings</p>	<p>Observe student presentations and record strengths/weaknesses;</p> <p>Collect observations from those interacting with student</p> <p>Analyze student reports/presentations and recommend improvements</p> <p>Discuss student project plans among professionals for feedback</p> <p>Review student prepared reports and recommend changes as needed</p>	<p>Ability to prioritize tasks within the project;</p> <p>Ability to identify resources needed for the project;</p> <p>Proficiency in information storage and retrieval ;</p> <p>Knowledge of and ability to use large information databases</p>	<p>Survey students at end of course of study. Give feedback to mentors</p> <p>Survey mentors at end of course of study. Give feedback to students.</p> <p>Trend survey results over time and academic periods to measure impact of mentor relationships and changes made</p> <p>Use projects presentations to identify the strengths and weaknesses in their abilities to perform rigorous data analysis and modify our course materials to fill the gaps</p>

Request for a New Graduate Certificate Program
Indiana University School of Informatics
IUPUI

Health Information Systems Programmer and Software Engineer

To be offered as a Indiana University Certificate at IUPUI
August 2010

Purpose of the program

There is a growing need for qualified health IT workers within health care and public health organizations. With many hospital systems and physician practices undergoing rapid transitions from traditional paper-based charting systems to using electronic medical records, digital imaging, and more sophisticated diagnostic systems, it is now essential to have qualified health IT workers who understand these information technologies to assist in their deployment and effective utilization to improve quality and efficiencies within the health care and public health system. This program will increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-based training. This program is initially intended to provide applicants with a background in IT to attain sufficient knowledge to become Health Information Systems architects. Participants in this training program are expected to attain a deep level understanding of health information system design and development. Participants enrolled in this program will gain both theoretical and practical background in health information system design.

The theory lecture sessions will include formal coursework that will be credited toward an IU certificate degree with a special emphasis on Health Information System Design and working with real-world health information systems will allow students to attain practical work experience.

Real-world practical experience will come from the following sources: 1) working on OpenMRS that is publically available and administered in part by Regenstrief Institute and 2) commercial health information systems (ex: Ceren) software that is currently installed and available in the School of Informatics laboratory. There are two primary goals associated with this training program: 1) provide computer science/IT professionals with adequate academic training in health informatics; and 2) to provide trainees with practical experience in developing health information system development, implementation, validation and system-level assessment.

Relation to existing certificate programs

The Health Information Systems Programmer and Software Engineer certificate program will not compete with any other programs at IU. At the same time, the certificate program

will leverage the strengths of the undergraduate and graduate degree programs already established in the School of Informatics at IUPUI campuses.

The target audience

This professional, health care and public health-oriented postgraduate certificate program is designed for students who come from baccalaureate-level studies or master level studies in Computer Science or in a closely related field with a strong programming and database skill set. The program seeks to improve knowledge and education in the Health Information Technology trends as well as health care transformation for the 21st century. The primary target of this program is graduates who desire to increase their knowledge of HIT systems and to enhance their employment opportunities in health care and public health organizations. Graduates from the certificate program will enhance their current skill set, allowing them to perform the role outlined by a “Health Systems Engineer.” Upon successful completion of the program, the trainee will have a basic understanding of health informatics and health information systems, the trainee will have a practical experience in developing software tools for health information systems, and the trainee will have an excellent knowledge of technical issues associated with health information system development such as security, client-server application development, health information reporting, and data analysis. Certificate-seeking students will receive knowledge and skills that are very hands-on and will help further promote adoption of HIT in the health care and public health professions.

The program consists of 18 credits from which 15 are classes and a three-credit practicum. The mentored practicum will allow trainees the opportunity to work on real-world health information systems such as at the Regenstrief Institute or local software companies for internship and practical training opportunities.

Plan for sustaining steady-state enrollment

In the first year (Fall 2010), three students will likely participate in the program. It is anticipated that three students will enroll in year two and five students in year three. The potential exists for much greater growth beyond this subsequently.

New resources

All courses are currently taught at IUPUI by existing faculty. However, additional full-time and adjunct faculty will need to be hired if the program grows beyond our current capacity.

Proposed date of the initiation of the certificate program

Proposed date of implementation is Fall 2010, assuming all necessary approvals have been met.

Persons designated as the certificate program head

Dr. Mathew Palakal, Associate Dean for Graduate Studies and Research, Indiana University School of Informatics, IUPUI, will provide the school administrative oversight.

Faculty initially involved in the program and their credentials

Gunther Schadow

Ph.D., Free University Berlin, 1998

Email: gschadow@regenstrief.org

Site: <http://informatics.iupui.edu/people/gschadow>

Work: 317-423-5521

Bio: Gunther Schadow received his MD from Humboldt University, Berlin, Germany and his PhD in Medical Informatics from Free University Berlin, Germany. In 1998, he joined the Regenstrief Institute and Indiana University School of Medicine as a Visiting Associate Scientist and since 2000 as a Medical Information Scientist. Dr. Schadow has been a leader in healthcare information standards for several years. He has developed most of the clinical side of the HL7 version 3.0 information model in collaboration with other HL7 members who represent the key companies, including laboratory and pathology information systems vendors in the medical information system industry. He has also developed a proposed standard for the syntax and semantic of units of measure published in JAMIA, which is now recommended by the U.S. Department for Health and Human Services. He has designed the HL7 version 3 data type specification. He has been co-leading medical device vendors and the FDA on a specification for EKG and other waveform data. He is currently under two contracts with the FDA to design two standards related to drug-knowledge: (1) e-Stability test data submission and (2) Structured Product Labeling (SPL) release 2, which will represent key knowledge in computer-actionable form that can drive decision support functionality in Computerized Physician Order Entry (CPOE) systems. Dr. Schadow has a long-term interest in natural language processing, and he has developed a program that extracts and codes specimens and findings on those specimens from pathology text reports. Dr. Schadow has extensive experience in design and implementation of secure Internet communication using SSL and IPsec, and he has developed a hardware device to support video conferencing to the homes of on-call physicians. Dr. Schadow joined the School of Informatics to develop the Medical Informatics program beginning November, 2004.

Mahesh Merchant

Ph.D., University of Utah, 1980

Email: mmerchan@iupui.edu

Site: <http://informatics.iupui.edu/people/mmerchan>

Work: 317-278-9206

Bio: Before joining Indiana University, Mahesh Merchant was a Senior Research Scientist in the Computer-Aiding Drug Discovery group at an international pharmaceutical organization. He worked with genomic data from the human genome in identifying drug targets for the Central Nervous System and Infectious Diseases groups. He developed several databases and data mining tools and integrated a Laboratory Information System for managing the large amount of data generated by microarray experiments across the enterprise. He has gained considerable experience in Validation (GLP, GMP, GxP) while working in a FDA regulated environment. Prior to joining the pharmaceutical organization, he worked at Physio-Control Corporation for 4 years to help develop a multi-lead electrocardiographic system for detection of ischemia and Coronary

Artery Disease (CAD). He and his colleagues had developed this system while he held a faculty position at the University of Utah. From 1983 to 1989, he worked as a Software Engineer to develop planetarium systems and high-end flight simulators at Evans and Sutherland in Salt Lake City, Utah. His areas of interest include open source Electronic Medical Records (Open VISTA); Laboratory Information Systems for the Life Sciences and Healthcare industry; Data Integration and Data Mining in the Life Sciences and Healthcare environment; Validation and Integration of Systems; Spread of Infectious Diseases in Hospitals and communities; Development of Tools and Databases for Microbial Genome Systems.

Anna M. McDaniel, DNS RN FAAN

D.N.S., Nursing Science, Indiana University, 1991

Email: amcdanie@iupui.edu

Site: <http://informatics.iupui.edu/people/amcdanie>

Work: 317-274-8095

Bio: Anna McDaniel is a Professor and Assistant Dean for Research, Indiana University School of Nursing. Her program of research in consumer health informatics is characterized by the innovative use of information technology to enhance decision-making by clinicians and to promote positive health decisions by consumers in the area of nicotine dependence. Her most recent study will establish a secure web portal to serve as a platform for translation of evidence-based cancer control behavioral interventions and information dissemination with a team of investigators from the School of Medicine, the IU Simon Cancer Center, and the Informatics Research Institute. She was a founding faculty member of the School of Informatics, the first of its kind in the United States, and served as the director of the health informatics graduate programs (master's and PhD) in that school for the first five years of its existence. Dr. McDaniel has a strong background and training in informatics (i.e., post-doctoral fellowship at Regenstrief Institute), and she holds numerous leadership positions in nursing and health informatics (e.g., chair of the NI Research Section of Midwest Nursing Research Society, Expert Panel on Nursing Informatics, American Academy of Nursing, founding faculty of the CIC Nursing and Health Informatics Collaboration, and board member for the Indiana Chapter of HIMSS).

Kathy Schilling

Ed.D., Boston University, 2002

Email: katschil@iupui.edu

Work: 317-278-2372

Bio: Dr. Katherine Schilling is a professor at the Indiana University School of Library and Information science at Indianapolis, with adjunct appointments at the Indiana University School of Informatics at Indianapolis, and at Indiana University School of Nursing. She is a member of the Indiana University Simon Cancer Center, and an affiliated researcher of the Walther Cancer Institute and the Regenstrief Institute. Dr. Schilling is active in professional organizations such as the Medical Library Association, and is a senior member of the Academy of Health Information Professionals (AHIP). She has also served as the Associate Editor of the Journal of the Medical Library Association (JMLA), and currently serves on the Journal's Editorial's Board.

Dr. Schilling's expertise and background include more than 18 years of experience in academic health sciences libraries and medical informatics. She has served as the PI, Co-PI, Project Director or Curriculum Director on funded projects totaling more than \$1,100,000. Her research focuses on the clinical and organizational implementation of health informatics applications; how clinical decision support tools impact on clinical and organizational decision making; and how end-users and decision-makers interact with information retrieval and knowledge management systems. She has experience in health literacy and health information literacy, evidence based medicine, information literacy, and access and management of health information, human-computer interaction, and knowledge management. Dr. Schilling has also published and presented nationally and internationally on the development and usability of web information portals for healthcare professionals and consumers, specifically in the areas of HIV/AIDS, mental health and behavioral oncology.

Hadi Kharrazi

Ph.D., Candidate Dalhousie University, 2008

Email: Kharrazi@iupui.edu

Site: <http://informatics.iupui.edu/people/>

Work: 317-278-7668

Bio: Dr. Kharrazi is an Interdisciplinary Medical Informatics Ph.D. Candidate between the faculty of Computer Sciences and the faculty of Medicine at Dalhousie University, Canada. He is a physician and holds a Masters in Health Informatics. He has been a fellow of CHPSTP (Canadian Health Informatics PhD/Postdoc Strategic Training Program) and has won several awards including the prestigious NSHRF and CIHR doctoral awards. Dr. Kharrazi believes that bridging the gaps between medicine and computer sciences requires research in different areas and therefore flexibility in research is an essential characteristic of a medical informatics researcher. His research interests are (but not limited to): patient empowerment and behavioral changes in patients by interactive systems, patient-centered decision support systems, human computer interaction in medicine and web-based personalized patient health records.

Dr. JT Finnell

MD, University of Vermont and MSc, IU School of Medicine

Email: jfinnell@iupui.edu

Site:

Work: 317-423-5575

Bio: Dr. Finnell is a Research Scientist, Regenstrief Institute, Inc., Associate Professor of Emergency Medicine for the Indiana University School of Medicine and an Adjunct Professor of Informatics for the Indiana University School of Informatics. Dr. Finnell currently serves as Co-Director for the Regenstrief Institute's Biomedical Fellowship Program, funded by the National Library of Medicine. Regenstrief Institute has had an NLM sponsored Medical Informatics training program since 1996. Dr. Finnell was a faculty mentor previous to becoming co-director of this highly successful training program in 2007. This is an immersive training program. Dr. Finnell currently oversees the training and development of seven individuals in this program. He has been involved

in post-graduate education and training since 1995 where he served as Associate Program Director for the Emergency Medicine Training Program in St. Paul, Minnesota.

Dr. Finnell joined the Regenstrief Institute in 2002 where, in addition to his role with the Fellows, his research activities focused on building the infrastructure necessary to capture emergency department visit data. The departmental tracking system known as "WizErD" began capturing visit data on July 15, 2003. His first publication entitled "Community Clinical Data Exchange for Emergency Medicine Patients" explored the pattern of emergency healthcare delivery across Indianapolis over a one-year period. They found that one-fourth of the emergency department patients with more than one visit also visited one of the other five hospital systems. These patients could potentially benefit the most from a shared clinical data network. Dr. Finnell's current research project is working to deliver patient care data, from the local Health Information Exchange, to Tablet PCs EMTs carry in the field, augmenting the data existing in their systems and providing them with information they might not have. He is examining whether this augmented data will allow the EMTs to better care for their patients in the field.

Dr. Josette Jones

Ph.D., University of Wisconsin-Madison, 2002

Email: jofones@iupui.edu

Site: <http://informatics.iupui.edu/people/jofjones>

Work: 317-274-8059

Bio: Josette Jones currently teaches Introduction to Nursing and Health Informatics (Fall), Clinical Information Systems (Fall-Spring), Business of Health Information Technology (Fall) and Social Impact of Information Technology (Spring). Her area of expertise is Nursing Informatics, more specifically tasks analysis and conceptual design of information systems for health care providers and consumers as well. Dr. Jones goals and intentions are to develop a program of research on "tell and ask" functional interfaces" where the user (i.e. nurse, patient, caregiver ...) communicates with a knowledge base by making logical assertions (tell) and posing questions (ask) based on domain specific knowledge representation, its ontologies, and ontological commitments. A knowledge representation embodies an aspect of the reality, believed to be relevant, attending to some features and processes while ignoring others. Ontology – using a wide variety of languages and notations - represents the content attended to, more specifically the description of the concepts and relationships that can exist for an agent or a community of agents observed. Knowledge representations and their ontologies are developed for the purpose of enabling knowledge sharing and reuse. Ontology, as thus, is a specification used for making ontological commitments. An ontological commitment is an agreement to use a vocabulary and data model in a way that enables information systems to validate and interact with user input conform to domain requirements.

Mathew Palakal

Ph.D., Concordia University, 1987

Email: mpalakal@cs.iupui.edu

Site: <http://informatics.iupui.edu/people/mpalakal>

Work: 317-278-7689

Bio: Dr. Mathew Palakal research interests include Biomedical Text Mining and Intelligent Information Management Systems. Biomedical Texting Mining: The biomedical literature databases continue to grow rapidly with vital information that is important for conducting sound biomedical research. BioMap is an attempt to create a scalable knowledgebase of biological relationships extracted from vast amount of biomedical literature data. The development of BioMap system addresses several innovative research issues related to knowledge discovery from literature documents and real-time, interactive access of this knowledge. Specific problems that are being investigated are: discovering explicit, implicit and directional relationships among biological entities from abstracts and full-text documents; discovering both explicit and implicit protein-protein interactions and computationally validating these interactions; and obtaining novel pathways associated with specific diseases in question. Protein-protein, gene-protein, and disease-drug interactions are examples of biological associations that are automatically discovered from a large number of literature documents. BioMap can discover interactions in user-specified biomedical problem domains, such as inflammatory diseases, regenerative biology, cancer, etc. and provide a user-centric view of the knowledge that is discovered. Intelligent Information Management Systems: There is a critical need for innovative information management and knowledge discovery tools to sift through vast volumes of heterogeneous data from various information sources. This project looks into developing Intelligent Software Systems that can integrate information resources and extract embedded knowledge from these information sources.

Alan D. Snell, MD, MMM

St. Vincent Health

Doctor of Medicine; Indiana University 1976

Masters Medical Management; Tulane University 1999

Email: adsnell@stvincent.org

Phone: 317-402-2943

Bio: Alan Snell, MD currently serves as the Chief Medical Informaticist for St. Vincent Health. He previously practiced Family Medicine in South Bend, IN for over 20 years. Dr. Snell also completed a Master's Degree in Medical Management through the American College of Physician Executives and Tulane University School of Public Health in New Orleans. He has lectured at the IUPUI School of Informatics and accepted interns from the graduate program there. In his current position, he is responsible for development and implementation of health information technologies including electronic medical records, physician order entry systems and electronic documentation. He has also introduced web-based Personal Health Records to connect St. Vincent patients electronically with their physicians, hospitals, and other providers. Previously, he served as the Chief Medical Information Officer at St. Joseph Regional Medical Center in South Bend for eight years, where he helped develop a community-wide Health Information Exchange and later served as its CEO. He also led efforts to automate over 100 physicians' practices in the South Bend-Mishawaka community.

Roland Gamache

Ph.D., Purdue University and MBA, Indiana University

Email: rgamache@iupui.edu

Site:

Work: 317-423-5575

Bio: Roland Gamache started as an Assistant Research Professor with the School of Medicine at Indiana University in July of 2009. Previously, he was the Director of the State Health Data Center at the Indiana State Department of Health. He worked at the Indiana State Department of Health for eighteen years. His work has focused on the application of public health data analysis in the areas of public health assessment and evaluation, policy development, data systems integration, strategic planning, quality improvement, and public health preparedness activities. He was the Director of the Public Health Preparedness Program at the ISDH for two years during this time. His recent work is in the development of integrated data systems for public health data needs. This work places an emphasis on database design for the improvement of analysis time, integration of public health systems with community-based Health Information Exchanges, and on improving the dissemination of public health information in an effort to measure and improve the health resiliency of the community. He was very active with the Public Health Informatics and Policy Committee of the Association of State and Territorial Health Officials to advance public health informatics policy and the benefits of partnerships with Health Information Exchanges in the community. In this role, he helped develop the list of Competencies for Public Health Professionals in Public Health Informatics. He completed his undergraduate work at the University of Lowell, MA. He received his Ph.D. in Chemistry from Purdue University and his MBA from Indiana University.

Admissions requirements and procedures

General Admission Requirements for the Health Information Systems Programmer and Software Engineer Graduate Certificate:

Candidates are expected to have a bachelor's or master level degree in Computer Science or in a closely related field with a strong programming and database skill set. Admission is selective: the Trainee Selection Committee evaluates applicants' abilities to succeed academically and their potential to contribute to the program. The certificate degree is designed for students with a bachelor's or master level degree in an aforementioned discipline who seek professional education in health IT.

Completion requirements and audit and certification procedures:

General Course Requirements: 18 graduate credit hours are required, including:

- Five courses (15 credits)
- Practicum (3 credits)

Specific Requirements

Courses (15 credits)

- H 628 Health Information Systems – An Overview

- INFO I 581 Health Informatics Standards and Terminology
 - INFO I 512 Scientific and Clinical Data Management
 - NURS 635 Consumer Health Informatics
 - INFO I 530 Foundations of Health Informatics
- Mentored Practicum**
- INFO I 590 Health Informatics System Design Practicum

Total cr. 18

Minimum overall GPA

Successful completion of the certificate requires at least a B average over all courses counting towards the certificate. Courses with a grade of C- or less must be taken again to count towards the certificate. The minimum grade that will be accepted in any single course is C.

Maximum number of credits that can be transferred from another institution

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other certificate programs may request to apply up to a maximum of three credits of these courses toward this certificate. Any waivers or substitutions must be approved by the committee that oversees the program.

Maximum number of undergraduate courses that can be applied

No undergraduate courses can be applied to this certificate program.

Maximum time for completion

All requirements for the certificate must be completed within one year.

Number of credit hours taken prior to admission to the certificate program that may be counted to completion of the degree

Up to 6 equivalent credit hours taken prior to admission to the certificate program, including 3 hours taken from another institution, will be counted towards the certificate. The rest of the courses must be completed at IUPUI within a one-year period from the time of admission.

Course lists for the program including course descriptions

Health Information Systems – An Overview H 628 (3 Credits)

Health Information Systems includes human computer interface and systems design; health care decision support and clinical guidelines; system selection; organizational issues in system integration; project management for information technology change; system evaluation; regulatory policies; impact of the Internet; economic impacts of ehealth; and distributed health care information technologies and future trends.

Health Informatics Standards & Terminology INFO I 581 (3 Credits)

Health information is captured as data of various formats and types. If health data is to improve patient care or if research data from different sources need to be joined together, health information standards are needed. Health information standards exist for data types and structures for messages, databases and documents as well as for the nomenclature of the myriad conceptual entities that are relevant for the biomedical domain (terminologies). The field of health information standards is also rapidly evolving. This course gives an overview of the established standards for health care data interchange and for the rapidly evolving field of biomedical informatics. The course will expose the principles and methodologies underlying most standards and also introduce the student to practical issues of reading and understanding specifications, implementing, and translating between standards.

Scientific and Clinical Data Management INFO I 512 (3 Credits)

Management and mining of data generated in scientific laboratories and clinical trials for data mining and knowledge discovery requires robust solutions that include knowledge discovery techniques and databases, extraction of data/metadata stored in data warehouses that use Storage Area Networks and dealing with security issues of handling this data.

Consumer Health Informatics NURS 635 (3 Credits)

Topics in this course include theoretical models for the delivery of consumer health information; Internet-based information delivery, access to patient information, and privacy issues; quality of consumer's health information health literacy; design and development of consumer health information resources; consumer access to clinical information; and current research.

Foundations of Health Informatics INFO I 530 (3 Credits)

This course will introduce the foundation of Health Informatics. It will review how information sciences and computer technology can be applied to enhance research and practice in healthcare. The basic principles of informatics that govern communication systems, clinical decisions, information retrieval, telemedicine, bioinformatics and evidence- based medicine will be explored.

Health Informatics System Design Practicum INFO I 590 (3 Credits)

The mentored practicum will allow trainees the opportunity to work on real-world health information systems such as: the Regenstrief Institute, or local software companies for internship and practical training opportunities.

Program Administration

The program administration is a committee comprised of Drs. Jones, Palakal, Finnell, Snell, and Roland Gamache who jointly oversee the program. All advising will be done by these faculty members. The School of Informatics, IUPUI, will take responsibility for all record keeping and tracking of students.

Procedures for program evaluation including the criteria for success

Upon completion of the Health Information Systems Programmer and Software Engineer certificate program, exit interviews will be conducted for all students to determine the effectiveness of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their professions. Follow-up interviews and surveys will be conducted to ascertain what learned skills they are currently using and if they have a designated professional title in the field of informatics. Given the projected enrollment of this program, and the fact that many of the graduates will remain employed locally, it is anticipated that most students will be tracked this way. Success of the program will be defined in terms of demand (enrollment) and the responses of the students surveyed upon completion of their degree and in the follow-up interviews.

PLANNING FOR LEARNING AND ASSESSMENT

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<p>Organizational Skills</p> <p>Project Management Skills</p> <p>Technical Skills</p> <p>Data Analysis</p>	<p>Demonstrate and articulate knowledge and skills learned</p> <p>Group participation</p> <p>Prepare reports and give presentations to others</p> <p>Prepare project plans</p> <p>Analyze data and organize into meaningful information</p>	<p>On the job experience</p> <p>Observing professionals in the field</p> <p>Training sessions</p> <p>Design sessions</p> <p>Project management meetings</p>	<p>Observe student presentations and record strengths/weaknesses;</p> <p>Collect observations from those interacting with student</p> <p>Analyze student reports/presentations and recommend improvements</p> <p>Discuss student project plans among professionals for feedback</p> <p>Review student prepared reports and recommend changes as needed</p>	<p>Ability to prioritize tasks within the project;</p> <p>Ability to identify resources needed for the project;</p> <p>Proficiency in information storage and retrieval ;</p> <p>Knowledge of and ability to use large information databases</p>	<p>Survey students at end of course of study. Give feedback to mentors</p> <p>Survey mentors at end of course of study. Give feedback to students.</p> <p>Trend survey results over time and academic periods to measure impact of mentor relationships and changes made</p> <p>Use projects presentations to identify the strengths and weaknesses in their abilities to perform rigorous data analysis and modify our course materials to fill the gaps</p>

Request for a New Graduate Certificate Program
Indiana University School of Informatics
IUPUI

Certificate in Informatics for Public Health Professionals

To be offered as a Indiana University Certificate at IUPUI
August 2010

Purpose of the program

There is a growing need for qualified health IT workers within health care and public health organizations. With many hospital systems and physician practices undergoing rapid transitions from traditional paper-based charting systems to using electronic medical records, digital imaging, and more sophisticated diagnostic systems, it is now essential to have qualified health IT workers who understand these information technologies to assist in their deployment and effective utilization to improve quality and efficiencies within the health care and public health system. This program will increase the availability of individuals qualified to serve in specific health information technology professional roles requiring university-based training as a public health professional.

Relation to existing certificate programs

The Certificate in Informatics for Public Health Professionals program will not compete with any other programs at IU. At the same time, the certificate program will leverage the strengths of the undergraduate and graduate degree programs already established in the School of Informatics at IUPUI campuses.

The target audience

This professional, public health-oriented postgraduate certificate program is designed for those who have masters or doctorate level preparation in public health. (The requirement for a masters or doctorate level preparation may be waived by the demonstration of significant public health experience through years of service and a leadership role at a public health agency.) Assuming substantial prior public health education, most of the proposed coursework will focus on classes available for the health informatics program. The integration with public health requirements will be fulfilled through a mentored project in health informatics with a focus on a public health research or community project. The program seeks to improve knowledge and education in the Health Information Technology trends as well as health care transformation for the 21st century.

The primary target of this program is graduates who desire to increase their knowledge of HIT systems and to enhance their employment opportunities in public health organizations. Certificate-seeking students will receive knowledge and skills that are very hands-on and will help further promote adoption of HIT in the public health professions.

The program consists of 18 credits from which 15 are classes and a three-credit practicum. Nine of the credits are distance accessible courses.

The courses chosen for this program include supporting the development of the strategic direction for public health informatics within the enterprise, using informatics standards, supporting information system development, procurement, and implementation that meet public health program needs, managing IT operations related to the project or to the program, monitoring IT operational management of external organizations, evaluating information systems and their applications, contributing to the development of public health information systems that are interoperable, and implementing solutions that ensure the confidentiality, security, and integrity of captured data while maximizing the availability of information for public health.

The mentored practicum will focus on the competency areas that include participating in the development of knowledge management tools for the public health enterprise, ensuring that the knowledge, information, and data needs of the project provides a practical experience in the integration of health informatics concepts with the needs of the public health community. To achieve these goals, the projects will focus on areas that provide participation in applied public health informatics research, and support the use of informatics to integrate clinical health, environmental risk, and population health. Additionally, all students are expected to participate in the Indiana Center of Excellence in Public Health Informatics (ICEPHI) monthly work-in progress seminars. After students complete their health informatics practicum, they are required to present their outcomes at one of these monthly meetings.

Plan for sustaining steady-state enrollment

In the first year (Fall 2010), four students will likely participate in the program. It is anticipated that five students will enroll in year two and six students in year three. The potential exists for much greater growth beyond this subsequently.

New resources

This certificate program consists of two new classes, Security and Privacy Policies and Regulations for Health Care (INFO 590) and Foundations in Public Health Informatics (P 650). The other courses are currently taught at IUPUI by existing faculty. However, additional full-time and adjunct faculty will need to be hired if the program grows beyond our current capacity.

Proposed date of the initiation of the certificate program

Proposed date of implementation is Fall 2010, assuming all necessary approvals have been met.

Persons designated as the certificate program head

Dr. Mathew Palakal, Associate Dean for Graduate Studies and Research, Indiana University School of Informatics, IUPUI, will provide the school administrative oversight.

Faculty initially involved in the program and their credentials

Roland Gamache

Ph.D., Purdue University and MBA, Indiana University

Email: rgamache@iupui.edu

Site:

Work: 317-423-5575

Bio: Roland Gamache started as an Assistant Research Professor with the School of Medicine at Indiana University in July of 2009. Previously, he was the Director of the State Health Data Center at the Indiana State Department of Health. He worked at the Indiana State Department of Health for eighteen years. His work has focused on the application of public health data analysis in the areas of public health assessment and evaluation, policy development, data systems integration, strategic planning, quality improvement, and public health preparedness activities. He was the Director of the Public Health Preparedness Program at the ISDH for two years during this time. His recent work is in the development of integrated data systems for public health data needs. This work places an emphasis on database design for the improvement of analysis time, integration of public health systems with community-based Health Information Exchanges, and on improving the dissemination of public health information in an effort to measure and improve the health resiliency of the community. He was very active with the Public Health Informatics and Policy Committee of the Association of State and Territorial Health Officials to advance public health informatics policy and the benefits of partnerships with Health Information Exchanges in the community. In this role, he helped develop the list of Competencies for Public Health Professionals in Public Health Informatics. He completed his undergraduate work at the University of Lowell, MA. He received his Ph.D. in Chemistry from Purdue University and his MBA from Indiana University.

Kathy Schilling

Ed.D., Boston University, 2002

Email: katschil@iupui.edu

Work: 317-278-2372

Bio: Dr. Katherine Schilling is a professor at the Indiana University School of Library and Information science at Indianapolis, with adjunct appointments at the Indiana University School of Informatics at Indianapolis and at Indiana University School of Nursing. She is a member of the Indiana University Simon Cancer Center and an affiliated researcher of the Walther Cancer Institute and the Regenstrief Institute. Dr. Schilling is active in professional organizations such as the Medical Library Association, and is a senior member of the Academy of Health Information Professionals (AHIP). She has also served as the Associate Editor of the Journal of the Medical Library Association (JMLA) and currently serves on the Journal's Editorial's Board.

Dr. Schilling's expertise and background include more than 18 years of experience in academic health sciences libraries and medical informatics. She has served as the PI, Co-PI, Project Director or Curriculum Director on funded projects totaling more than \$1,100,000. Her research focuses on the clinical and organizational implementation of

health informatics applications; how clinical decision support tools impact clinical and organizational decision making; and how end-users and decision-makers interact with information retrieval and knowledge management systems. She has experience in health literacy and health information literacy, evidence based medicine, information literacy, and access and management of health information, human-computer interaction, and knowledge management. Dr. Schilling has also published and presented nationally and internationally on the development and usability of web information portals for healthcare professionals and consumers, specifically in the areas of HIV/AIDS, mental health and behavioral oncology.

Gunther Schadow

Ph.D., Free University Berlin, 1998

Email: gschadow@regenstrief.org

Site: <http://informatics.iupui.edu/people/gschadow>

Work: 317-423-5521

Bio: Gunther Schadow received his MD from Humboldt University, Berlin, Germany and his PhD in Medical Informatics from Free University Berlin, Germany. In 1998, he joined the Regenstrief Institute and Indiana University School of Medicine as a Visiting Associate Scientist and since 2000 as a Medical Information Scientist. Dr. Schadow has been a leader in healthcare information standards for several years. He has developed most of the clinical side of the HL7 version 3.0 information model in collaboration with other HL7 members who represent the key companies, including laboratory and pathology information systems vendors in the medical information system industry. He has also developed a proposed standard for the syntax and semantic of units of measure published in JAMIA, which is now recommended by the U.S. Department for Health and Human Services. He has designed the HL7 version 3 data type specification. He has been co-leading medical device vendors and the FDA on a specification for EKG and other waveform data. He is currently under two contracts with the FDA to design two standards related to drug-knowledge: (1) e-Stability test data submission and (2) Structured Product Labeling (SPL) release 2, which will represent key knowledge in computer-actionable form that can drive decision support functionality in Computerized Physician Order Entry (CPOE) systems. Dr. Schadow has a long-term interest in natural language processing, and he has developed a program that extracts and codes specimens and findings on those specimens from pathology text reports. Dr. Schadow has extensive experience in design and implementation of secure Internet communication using SSL and IPsec, and he has developed a hardware device to support video conferencing to the homes of on-call physicians. Dr. Schadow joined the School of Informatics to develop the Medical Informatics program beginning November, 2004.

Anna M. McDaniel, DNS RN FAAN

D.N.S., Nursing Science, Indiana University, 1991

Email: amcdanie@iupui.edu

Site: <http://informatics.iupui.edu/people/amcdanie>

Work: 317-274-8095

Bio: Anna McDaniel is a Professor and Assistant Dean for Research, Indiana University School of Nursing. Her program of research in consumer health informatics is

characterized by the innovative use of information technology to enhance decision-making by clinicians and to promote positive health decisions by consumers in the area of nicotine dependence. Her most recent study will establish a secure web portal to serve as a platform for translation of evidence-based cancer control behavioral interventions and information dissemination with a team of investigators from the School of Medicine, the IU Simon Cancer Center, and the Informatics Research Institute. She was a founding faculty member of the School of Informatics, the first of its kind in the United States, and served as the director of the health informatics graduate programs (master's and PhD) in that school for the first five years of its existence. Dr. McDaniel has a strong background and training in informatics (i.e., post-doctoral fellowship at Regenstrief Institute), and she holds numerous leadership positions in nursing and health informatics (e.g., chair of the NI Research Section of Midwest Nursing Research Society, Expert Panel on Nursing Informatics, American Academy of Nursing, founding faculty of the CIC Nursing and Health Informatics Collaboration, and board member for the Indiana Chapter of HIMSS).

Mahesh Merchant

Ph.D., University of Utah, 1980

Email: mmerchan@iupui.edu

Site: <http://informatics.iupui.edu/people/mmerchan>

Work: 317-278-9206

Bio: Before joining Indiana University, Mahesh Merchant was a Senior Research Scientist in the Computer-Aiding Drug Discovery group at an international pharmaceutical organization. He worked with genomic data from the human genome in identifying drug targets for the Central Nervous System and Infectious Diseases groups. He developed several databases and data mining tools and integrated a Laboratory Information System for managing the large amount of data generated by microarray experiments across the enterprise. He has gained considerable experience in Validation (GLP, GMP, GxP) while working in a FDA regulated environment. Prior to joining the pharmaceutical organization, he worked at Physio-Control Corporation for 4 years to help develop a multi-lead electrocardiographic system for detection of ischemia and Coronary Artery Disease (CAD). He and his colleagues had developed this system while he held a faculty position at the University of Utah. From 1983 to 1989, he worked as a Software Engineer to develop planetarium systems and high-end flight simulators at Evans and Sutherland in Salt Lake City, Utah. His areas of interest include open source Electronic Medical Records (Open VISTA); Laboratory Information Systems for the Life Sciences and Healthcare industry; Data Integration and Data Mining in the Life Sciences and Healthcare environment; Validation and Integration of Systems; Spread of Infectious Diseases in Hospitals and communities; Development of Tools and Databases for Microbial Genome Systems.

Dr. JT Finnell

MD, University of Vermont and MSc, IU School of Medicine

Email: jfinnell@iupui.edu

Site:

Work: 317-423-5575

Bio: Dr. Finnell is a Research Scientist, Regenstrief Institute, Inc., Associate Professor of Emergency Medicine for the Indiana University School of Medicine and an Adjunct Professor of Informatics for the Indiana University School of Informatics. Dr. Finnell currently serves as Co-Director for the Regenstrief Institute's Biomedical Fellowship Program, funded by the National Library of Medicine. Regenstrief Institute has had an NLM sponsored Medical Informatics training program since 1996. Dr. Finnell was a faculty mentor previous to becoming co-director of this highly successful training program in 2007. This is an immersive training program. Dr. Finnell currently oversees the training and development of seven individuals in this program. He has been involved in post-graduate education and training since 1995 where he served as Associate Program Director for the Emergency Medicine Training Program in St. Paul, Minnesota.

Dr. Finnell joined the Regenstrief Institute in 2002 where, in addition to his role with the Fellows, his research activities focused on building the infrastructure necessary to capture emergency department visit data. The departmental tracking system known as "WizErD" began capturing visit data on July 15, 2003. His first publication entitled "Community Clinical Data Exchange for Emergency Medicine Patients" explored the pattern of emergency healthcare delivery across Indianapolis over a one-year period. They found that one-fourth of the emergency department patients with more than one visit also visited one of the other five hospital systems. These patients could potentially benefit the most from a shared clinical data network. Dr. Finnell's current research project is working to deliver patient care data, from the local Health Information Exchange, to Tablet PCs EMTs carry in the field, augmenting the data existing in their systems and providing them with information they might not have. He is examining whether this augmented data will allow the EMTs to better care for their patients in the field.

Dr. Josette Jones

Ph.D., University of Wisconsin-Madison, 2002

Email: jofones@iupui.edu

Site: <http://informatics.iupui.edu/people/jofjones>

Work: 317-274-8059

Bio: Josette Jones currently teaches Introduction to Nursing and Health Informatics (Fall), Clinical Information Systems (Fall-Spring), Business of Health Information Technology (Fall) and Social Impact of Information Technology (Spring). Her area of expertise is Nursing Informatics, more specifically tasks analysis and conceptual design of information systems for health care providers and consumers as well. Dr. Jones goals and intentions are to develop a program of research on "tell and ask" functional interfaces" where the user (i.e. nurse, patient, caregiver ...) communicates with a knowledge base by making logical assertions (tell) and posing questions (ask) based on domain specific knowledge representation, its ontologies, and ontological commitments. A knowledge representation embodies an aspect of the reality, believed to be relevant, attending to some features and processes while ignoring others. Ontology – using a wide variety of languages and notations - represents the content attended to, more specifically the description of the concepts and relationships that can exist for an agent or a community of agents observed. Knowledge representations and their ontologies are developed for the purpose of enabling knowledge sharing and reuse. Ontology, as thus, is

a specification used for making ontological commitments. An ontological commitment is an agreement to use a vocabulary and data model in a way that enables information systems to validate and interact with user input conform to domain requirements.

Mathew Palakal

Ph.D., Concordia University, 1987

Email: mpalakal@cs.iupui.edu

Site: <http://informatics.iupui.edu/people/mpalakal>

Work: 317-278-7689

Bio: Dr. Mathew Palakal research interests include Biomedical Text Mining and Intelligent Information Management Systems. Biomedical Text Mining: The biomedical literature databases continue to grow rapidly with vital information that is important for conducting sound biomedical research. BioMap is an attempt to create a scalable knowledgebase of biological relationships extracted from vast amount of biomedical literature data. The development of BioMap system addresses several innovative research issues related to knowledge discovery from literature documents and real-time, interactive access of this knowledge. Specific problems that are being investigated are: discovering explicit, implicit and directional relationships among biological entities from abstracts and full-text documents; discovering both explicit and implicit protein-protein interactions and computationally validating these interactions; and obtaining novel pathways associated with specific diseases in question. Protein-protein, gene-protein, and disease-drug interactions are examples of biological associations that are automatically discovered from a large number of literature documents. BioMap can discover interactions in user-specified biomedical problem domains, such as inflammatory diseases, regenerative biology, cancer, etc. and provide a user-centric view of the knowledge that is discovered. Intelligent Information Management Systems: There is a critical need for innovative information management and knowledge discovery tools to sift through vast volumes of heterogeneous data from various information sources. This project looks into developing Intelligent Software Systems that can integrate information resources and extract embedded knowledge from these information sources.

Alan D. Snell, MD, MMM

St. Vincent Health

Doctor of Medicine; Indiana University 1976

Masters Medical Management; Tulane University 1999

Email: adsnell@stvincent.org

Phone: 317-402-2943

Bio: Alan Snell, MD currently serves as the Chief Medical Informaticist for St. Vincent Health. He previously practiced Family Medicine in South Bend, IN for over 20 years. Dr. Snell also completed a Master's Degree in Medical Management through the American College of Physician Executives and Tulane University School of Public Health in New Orleans. He has lectured at the IUPUI School of Informatics and accepted interns from the graduate program there. In his current position, he is responsible for development and implementation of health information technologies including electronic medical records, physician order entry systems and electronic documentation. He has also

introduced web-based Personal Health Records to connect St. Vincent patients electronically with their physicians, hospitals, and other providers. Previously, he served as the Chief Medical Information Officer at St. Joseph Regional Medical Center in South Bend for eight years, where he helped develop a community-wide Health Information Exchange and later served as its CEO. He also led efforts to automate over 100 physicians' practices in the South Bend-Mishawaka community.

Admissions requirements and procedures

General Admission Requirements for the Certificate in Informatics for Public Health Professionals:

Ideal eligible students entering this program will have a Master's or doctorate level preparation in public health. (The requirement for a masters of doctorate level preparation maybe waived by the demonstration of significant public health experience through years of service and a leadership role at a public health agency.) Admission is selective: the Trainee Selection Committee evaluates applicants' abilities to succeed academically and their potential to contribute to the program. The certificate degree is designed for students with a Master's or doctorate level degree who seek professional education in health informatics.

Completion requirements and audit and certification procedures:

General Course Requirements: 18 graduate credit hours are required, including:

- Two core courses (6 credits)
- Three specialization courses (9 credits)
- Practicum (3 credits)

Specific Requirements

Core (6 credits)

- PBHL P 650 Readings in Public Health with subtopic Foundations in Public Health Informatics
- INFO I 581 Health Informatics Standards and Terminology

Mentored Practicum (3 credits)

- PBHL P 650 Readings in Public Health with subtopic Informatics Project for Public Health Professionals

Specialization (9 credits)

- INFO I 505 Informatics Project Management
- INFO I 512 Scientific and Clinical Data Management
- INFO I 578 Data Analysis
- NURS 635 Consumer Health Informatics
- INFO I 535 Clinical Information Systems
- INFO I 590 Security and Privacy Policies and Regulations for Health Care

Total cr. 18

Minimum overall GPA

Successful completion of the certificate requires at least a B average over all courses counting towards the certificate. Courses with a grade of C- or less must be taken again to count towards the certificate. The minimum grade that will be accepted in any single course is C.

Maximum number of credits that can be transferred from another institution

Applicants who have already earned credit for one or more of the equivalent courses from other institutions and other certificate programs may request to apply up to a maximum of three credits of these courses toward this certificate. Any waivers or substitutions must be approved by the committee that oversees the program.

Maximum number of undergraduate courses that can be applied

No undergraduate courses can be applied to this certificate program.

Maximum time for completion

All requirements for the certificate must be completed within one year.

Number of credit hours taken prior to admission to the certificate program that may be counted to completion of the degree

Up to 6 equivalent credit hours taken prior to admission to the certificate program, including 3 hours taken from another institution, will be counted towards the certificate. The rest of the courses must be completed at IUPUI within a one-year period from the time of admission.

Course lists for the program including course descriptions

**Readings in Public Health with subtopic Foundations in Public Health Informatics
PBHL P 650 (3 Credits)**

This course will describe how Informatics principles are applied to the practice of Public Health including a brief review of core public health functions, a description of the current policies governing the use of informatics in public health, and an outline of the movement toward the increased application of informatics principles in both public health and clinical health systems. The role of informatics in these disciplines will be further explored through a systematic discussion of the interaction of clinical health systems when used to monitor population health metrics for public health surveillance through the automated electronic reporting of notifiable lab results. This course will also examine the issues and roles of clinical and public health standards, the value of near real-time syndromic surveillance systems, a review of typical public health business practices that are primarily paper-based, and the potential for the use of electronic alerting systems and the decision support tools. The decision support overview will

include points to consider in the design of the database, data mining, and an introduction to knowledge management principles.

This course will also review the potential impact of these systems on public health registry systems such as Vital Records, Immunizations, New Born Screening, and Cancer. The importance of external data sources required for public health, the critical need for accurate matching algorithms to link the data from these various data sources, the competencies essential for these new workforce requirements, and a better understanding of the clinical/public health partnership in this environment will be described. The course will conclude with a review of the policy implications in public health informatics including privacy, security and data transparency, strategic planning, patient safety, and medical errors.

Data Analysis

INFO I 578

(3 Credits)

Focuses on understanding, manipulating, and analyzing quantitative data in nursing and health care. Includes use of computer-based systems for data management and statistical analysis. Application and interpretation multivariate statistical models for decision-making.

Consumer Health Informatics

NURS 635

(3 Credits)

Topics in this course include theoretical models for the delivery of consumer health information; Internet-based information delivery, access to patient information, and privacy issues; quality of consumer's health information health literacy; design and development of consumer health information resources; consumer access to clinical information; and current research.

Clinical Information Systems

INFO I 535

(3 Credits)

CIS includes human computer interface and systems design; health care decision support and clinical guidelines; system selection; organizational issues in system integration; project management for information technology change; system evaluation; regulatory policies; impact of the Internet; economic impacts of e-health; distributed healthcare information technologies and future trends.

Health Informatics Standards and Terminology

INFO I 581

(3 Credits)

Health information is captured as data of various formats and types. If health data is to improve patient care or if research data from different sources need to be joined together health information standards are needed. Health information standards exist for data types and structures for messages, databases and documents as well as for the nomenclature of the myriad conceptual entities that is relevant for the biomedical domain (terminologies). The field of health information standards is also rapidly evolving. This course gives an overview of the established standards for health care data interchange, and for the rapidly evolving field of biomedical informatics. The course will expose the principles and methodologies underlying most standards and also introduce the student to practical issues of reading and understanding specifications, implementing, and translating between standards.

Informatics Project Management**INFO I 505****(3 Credits)**

This course introduces standard project management concepts and capabilities in the innovative and creative knowledge-work projects involving computers. These are targeted as a common ground for all members of a successful team, not only for the Project Manager. Through lecture, reading, discussion, computer lab exercises and projects, students will become more proficient with basic project management terminology, techniques and technologies. Students will apply industry-standard project management in a framework of productive team dynamics, consumer frame of reference, and organizational change optionally continuing to professional certification.

Security and Privacy Policies and Regulations for Health Care**INFO I 590****(3 Credits)**

National standards for transactions, privacy and security of health care information system and patient data, including policy, procedures, guidelines, security architectures, risk assessments, disaster recovery, and business continuity. Particularly, Health Insurance Portability and Accountability Act (HIPAA).

Scientific and Clinical Data Management**INFO I 512****(3 Credits)**

Management and mining of data generated in scientific laboratories and clinical trials for data mining and knowledge discovery requires robust solutions that include knowledge discovery techniques and databases, extraction of data/metadata stored in data warehouses that use Storage Area Networks and dealing with security issues of handling this data.

Readings in Public Health with subtopic Informatics Project for Public Health Professionals**PBHL P 650****(3 Credits)**

This course is designed to expose the student to different readings in public health. The course will allow the student to apply skills learned in the public health core courses by collecting data and applying techniques. The student will be required to read critically published papers and identify research topics.

Program Administration

The program administration is a committee comprised of Drs. Jones, Palakal, Finnell, Snell, and Roland Gamache who jointly oversee the program. All advising will be done by these faculty members. The School of Informatics, IUPUI, will take responsibility for all record keeping and tracking of students.

Procedures for program evaluation including the criteria for success

Upon completion of the Certificate in Informatics for Public Health Professionals program, exit interviews will be conducted for all students to determine the effectiveness of the program in meeting their needs and to identify how they are using the skills and tools learned in the program in their professions. Follow-up interviews and surveys will be conducted to ascertain what learned skills they are currently using and if they have a designated professional title in the field of informatics. Given the projected enrollment of

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PLANNING FOR LEARNING AND ASSESSMENT

1. What general outcome are you seeking?	2. How would you know it (the outcome) if you saw it? (What will the student know or be able to do?)	3. How will you help students learn it? (in class or out of class)	4. How could you measure each of the desired behaviors listed in #2?	5. What are the assessment findings?	6. How will the aggregated assessment findings be used to improve your program?
Organizational Skills	Demonstrate and articulate knowledge and skills learned	On the job experience	Observe student presentations and record strengths/weaknesses;	Ability to prioritize tasks within the project;	Survey students at end of course of study. Give feedback to mentors
Project Management Skills	Group participation	Observing professionals in the field	Collect observations from those interacting with student	Ability to identify resources needed for the project;	Survey mentors at end of course of study. Give feedback to students.
Technical Skills	Prepare reports and give presentations to others	Training sessions	Analyze student reports/presentations and recommend improvements	Proficiency in information storage and retrieval ;	Trend survey results over time and academic periods to measure impact of mentor relationships and changes made
Data Analysis	Prepare project plans	Design sessions	Discuss student project plans among professionals for feedback	Knowledge of and ability to use large information databases	Use projects presentations to identify the strengths and weaknesses in their abilities to perform rigorous data analysis and modify our course materials to fill the gaps
	Analyze data and organize into meaningful information	Project management meetings	Review student prepared reports and recommend changes as needed		



INDIANA UNIVERSITY

DEPARTMENT OF PUBLIC HEALTH

School of Medicine

May 11, 2010

Dr. J.T. Finnell, Associate Professor of Emergency Medicine
Dr. Mathew Palakal, Associate Dean, School of Informatics
Indiana University/Regenstrief Institute
410 West 10th Street, HS2000
Indianapolis, IN 46202

Dear Drs. Finnell and Palakal,

I am writing to express my support for the proposed Graduate Certificate in Informatics for Public Health Professionals. Many of the graduates of our Master of Public Health (MPH) Program are interested in obtaining the knowledge and skills necessary to meet the growing demand for public health informatics. Your proposal for a graduate certificate in informatics designed for practicing public health professionals will provide alumni of our program with the education and training necessary to meet this demand. The faculty in the Department of Public Health at Indiana University School of Medicine are pleased that this certificate is being proposed on the IUPUI campus.

Sincerely,

Carole Kacius, PhD
Associate Chair for Academic Programs
and Alumni Services