An Exploratory Study Demonstrating the Health Information Management Profession as a STEM Discipline

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Abstract

It is time to make the case for health information management (HIM) to be included in science, technology, engineering, and math (STEM) education. A careful review of the HIM competencies approved by the American Health Information Management Association (AHIMA) illustrates the role of HIM professionals in informatics, data analytics, and data use. More precisely, the competency subdomains clearly align with content in the STEM disciplines of science, math, and technology, and the individual competencies or tasks in each subdomain solidify the assertion that HIM should be considered part of the STEM disciplines. Evaluation of AHIMA membership data showed that, at the education and work setting levels, AHIMA members are employed in many areas that are common to both HIM and STEM.

Keywords: STEM (science, technology, engineering, mathematics), health information management (HIM), HIM professionals, curricular competency

Introduction

Despite the International Technology and Engineering Educators Association's definition of STEM as a new transdisciplinary educational subject that integrates the disciplines of science, technology, engineering, and mathematics into a single course of study, there is no consensus among scholars in support of that definition.[1, 2] According to Zollman and colleagues,., STEM has an even broader meaning, including areas such as agriculture, environment, economics, education, and medicine.[3] The National Science Foundation (NSF) also defines STEM in broader strokes and, while including the basics of mathematics, natural sciences, engineering, and computer and information sciences, also includes psychology, political science, economics, and sociology within the discipline.[4] The literature suggests that the STEM movement evolved from policies within the NSF. Breiner and colleagues explained that NSF first used the acronym SMET for science, mathematics, engineering, and technology in the early 1990s but determined that this acronym would cause issues of vulgarity, and therefore SMET was changed to STEM.[5] The early 2000s saw increased momentum toward STEM education with resulting interest by the federal government in funding STEM education. Since 2011, the federal government has invested several billion dollars on STEM education.[6]

The definition of STEM is central to the issue of STEM education and funding. In 2015, President Barack Obama signed the STEM Education Act, which expanded the definition of STEM to

include computer science programs.[7] In 2017, President Donald Trump reinforced this definition by expanding the access to computer science and STEM education. This encouragement to the Secretary of Education included prioritizing computer science and making the promotion of high-quality STEM education a priority for the Department of Education.[8] The notice of this priority was followed with a promise from the country's largest technology firms to dedicate money, technology, and volunteers to this initiative.[9] It is time for other disciplines to make the case to be included in STEM education.

One such discipline is health information management (HIM). A look at the content of HIM curricula supports this assertion. The HIM discipline is a combination of business, science, and information technology. It is the process of acquiring, analyzing, and protecting digital and traditional medical information, which is vital to providing quality and accessible patient care.[10] Health information professionals support patient care by managing their medical data. They ensure that patients' health information and records are complete, accurate, and protected.

The AHIMA Council for Excellence in Education (CEE) is the leading force in education strategy for health information professionals, guiding the academic community and industry stakeholders through innovations in academic programs, curricula, and resources. The CEE achieves this aim through many different task-oriented workgroups.[11] One of the workgroups, the Graduate Resource Alliance (GRA) workgroup, reviewed and researched STEM and HIM curricular components to identify areas of similarities and overlap between the two fields. This work outlines the workgroup's findings and recommendations.

Educational HIM programs at the associate, baccalaureate, and master's levels were required to incorporate the 2014 HIM Curricula Competencies into curricula by August 1, 2017.[12] (See Appendices A, B, and C.) The baccalaureate-level competencies consist of six domains, which are further divided into subdomains. Specific competencies are organized and listed under each subdomain. A careful review of the subdomains illustrates the role of HIM professionals in informatics, data analytics, and data use. For example, Domain III, Informatics, Analytics and Data Use, comprises eight subdomains:

Subdomain III.A: Health Information Technologies
Subdomain III.B: Information Management Strategic Planning
Subdomain III.C: Analytics and Decision Support
Subdomain III.D: Health Care Statistics
Subdomain III.E: Research Methods
Subdomain III.F: Consumer Informatics
Subdomain III.G: Health Information Exchange
Subdomain III.H: Information Integrity and Data Quality

The subdomain titles clearly align with content in the STEM disciplines of science, math, and technology. Specific competencies under each subdomain solidify the assertion that HIM is part of the STEM disciplines. For example, at the baccalaureate level, Subdomain III.C, Analytics and Decision Support, contains the following competencies:

III.C.1: Apply analytical results to facilitate decision-making
III.C.2: Apply data extraction methodologies
III.C.3: Recommend organizational action based on knowledge obtained from data exploration and mining
III.C.4: Analyze clinical data to identify trends that demonstrate quality, safety, and effectiveness of healthcare
III.C.5: Apply knowledge of database querying and data exploration and mining techniques to facilitate information retrieval
III.C.6: Evaluate administrative reports using appropriate software

These competencies or tasks mimic content in the area of computer science, a new discipline in STEM. For each of the competencies, a Bloom's taxonomy level is assigned to specify at what level the material must be covered. These levels are Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.[13] Appendix B demonstrates that many of the baccalaureate-level competencies are to be taught at higher taxonomic levels. A careful review of Appendices A, B, and C will illustrate several other subdomains and competencies that directly relate to the STEM disciplines. Further, AHIMA provides professional credentials and certifications based on specific knowledge, domains and skill sets.[14] The Registered Health Information Administrator (RHIA) and Registered Health Information Technician (RHIT) credentials are designated for individuals who have completed an accredited HIM program at the baccalaureate or associate degree level, respectively. In addition, AHIMA offers specialty credentials, including Certified Health Data Analyst (CHDA), Certified in Healthcare Privacy and Security (CHPS), Clinical Documentation Improvement Practitioner (CDIP), and Certified Professional in Health Informatics (CPHI),[15] that require knowledge within STEM domains, as shown in Figure 1.

The purpose of this study is to map and quantify the accreditation-required curricular education components, competencies, roles, and skills of HIM professionals with the STEM disciplines currently recognized by Department of Homeland Security. The study will make recommendations to include the HIM profession as a STEM discipline.

Methodology

The study employed two methodologies to meet the proposed objectives. Methodology 1 includes the review of current curricula in both the HIM and STEM disciplines, and Methodology 2 includes the review of AHIMA membership profile data.

Methodology 1: Review and Mapping of STEM Disciplines

This methodology involved the review of current curricula in both the HIM and STEM disciplines. This review was performed primarily by reviewing the standards and literature available on both fields. Many HIM professionals are employed in a recognized STEM occupation. A comparison of the HIM competencies to a report by Vilorio[16] revealed the following STEM occupation categories that are aligned with the roles and responsibilities of many HIM professionals:

- Computer and information research scientists
- Database administrators
- Information security analysts
- Statisticians
- Computer occupations (in general)

With these STEM occupations in mind, the GRA workgroup did the following:

1. Compiled a listing of the STEM-related job skills and responsibilities for HIM professionals performing data analysis tasks (using AHIMA's Health Data Analysis Toolkit[17]),
2. Compiled a listing of the STEM-related competency tasks for AHIMA's CHPS credential (using the CHPS Exam Preparation guide[18]), and
3. Compiled a listing of the STEM-related competency tasks for AHIMA's CHDA credential (using the CHDA Exam Preparation guide[19]).

All the data compiled for the STEM-related job functions and credential competencies are listed in Appendix D. A review of the data in Appendix D clearly illustrates that many HIM professionals are working and thriving in STEM occupations.

Another organization that is involved with the categorization of STEM-related occupations is the Occupational Information Network (O*NET). It is the nation's primary source of occupational

information, containing standardized and occupation-specific descriptors. The O*NET database was developed under the sponsorship of the US Department of Labor/Employment and Training Administration via a grant to the North Carolina Department of Commerce. Occupations are broken down into common job requirements, worker attributes, and the content and context of work performed. The O*NET database allows researchers to search for jobs with these characteristics.[20] The Bureau of Labor Statistics Standard Occupational Classification (SOC) and coding structure provide further research capabilities.[21] The O*NET occupations are all assigned an SOC code. Each O*NET/SOC coded occupation was compared to the AHIMA roles and competencies (see Appendix D). If an O*NET/SOC occupation did not match with the AHIMA roles and competencies, then it was not included as an occupation that is related to the HIM profession. The search identified 308 occupations that are categorized as STEM occupations. We explored each of the 308 occupations in relation to the curricular components, competencies, roles, and skills of HIM professionals. According to that review, the number of STEM occupations that were related to HIM was 26, as shown in Table 1.

Methodology 2: Review of AHIMA Membership Profile Data

We collected and analyzed AHIMA membership data using both Tableau and Microsoft Excel. The data file consisted of 71,630 records organized into nine columns. The data analysis involved eliminating entries that were null and entries indicating that a member was unemployed (if job title was the field of interest). The variables collected and displayed in columns included job title, member type, member's credentials, job level category (e.g., director, executive, HIM technician, clerical, manager, educator, consultant), job setting, education level, state of residence, and country.

Assessment of the job level categories showed that of the 71,630 members, 12,487 did not identify their job level category and 4,578 self-reported that they were unemployed. Of those who identified their job category and are employed (55,567 members), 3.5 percent (1,969) self-reported that they were in a technology role. Other roles included clerical/administrative support, clinician, consultant, director, educator, executive/president/vice president, HIM technician, and manager/supervisor roles. The manager/supervisor and consultant roles included some job titles that were technology oriented in nature. Of the 55,567 members, 15.6 percent self-reported being in a manager/supervisor role, and 7 percent indicated that they were in a consultant role.

Analysis of technology-oriented credentials was performed for the AHIMA members who had self-reported as being in a technology role job category. The credentials considered included CHDA and CPHI. Analysis by CHDA identified 285 members who self-reported having the CHDA credential. Of these 285 members, 20 percent self-reported having a technology role. Analysis by CPHI showed that 168 members self-reported having the CPHI credential. Of these 168 members, 13 percent self-reported having the CPHI credential and being in a technology role, while 17 percent self-reported having the CHDA credential and being in a technology role.

Table 2 served as the basis for further analysis of the data. The AHIMA member job titles and job categories in the AHIMA data set do not map directly to the O*NET list; therefore, keywords closely aligned with the occupation list were selected and used as search criteria. We identified the following STEM keywords based on the occupations listed in Table 2: computer, technology, informatics, information security, business intelligence, network, data, system analyst, and database. These keywords were used as criteria to determine how many AHIMA members had the keyword in their job title and to assess whether the members with these STEM titles were pursuing STEM-related AHIMA credentialing.

Table 3 summarizes the results. The table includes the findings from the job title keyword search and the results by the three STEM-related AHIMA credentials: CHDA, CPHI, and CHPS. Of the STEM-related keywords, data ranked the highest in the job title search, followed by

informatics and technology. The findings also showed that the CHDA and CPHI were mostly held by members with data in their job title. The findings also showed that a significant proportion of the members with these STEM keywords in their job titles did not pursue associated AHIMA credentials.

Results

Review and Mapping of STEM Disciplines

This search identified 308 O*NET/SOC occupations that are categorized as STEM occupations. We explored each of the 308 occupations using the HIM curricular components and competencies and the roles and skills of HIM professionals. The review revealed that 26 STEM occupations were related to HIM (see Table 1 and Table 2). This finding indicates that the role of the HIM professional falls within the STEM disciplines. The majority of the HIM professions fell within the major occupation types of Research Development, Design and Practitioners, and Technologists and Technicians.

Review of AHIMA Membership Profile Data

Of the 3,795 AHIMA members with STEM technology job titles, about 40 percent hold a baccalaureate degree and 20 percent possess a graduate degree. The vision outlined in the recent AHIMA white paper "HIM Reimagined" emphasizes the goal to increase the proportion of HIM professionals with graduate degrees in fields such as health informatics.[22] Consequently, we expect to see further increase in the number of HIM professionals trained in the STEM technology discipline and pursuing careers in STEM informatics roles. This prediction is supported by the finding that HIM professionals with graduate degrees were mostly in STEM technology roles. The findings also show that a majority of the professionals in STEM technology roles hold positions in acute care hospital settings. We expect that these large organization settings will continue to offer employment opportunities for HIM professionals in STEM technology roles, specifically health informatics roles. From these findings, we can conclude that HIM professionals are employed in STEM technology roles, and having a graduate degree increases the likelihood of this being the case.

Discussion

Although the acronym STEM may seem to represent no more than a simple list of disciplines, Siekmann explains its complexity when linking the components of education, employment, and productivity.[23] Because of the complexity and the broad scope of the STEM definition, Siekmann recommends identifying the components within STEM that are distinct.[24] Taking this approach may pave the way for more concise identification of all disciplines that fall within the STEM realm. It would allow for each discipline to be examined on the basis of its STEM elements, rather than on the broad categories of science, technology, engineering, and mathematics.[25] As Siekmann recommends, in this study we unpacked and identified the major components within HIM to build the case for its inclusion as a STEM discipline.

A careful review of the HIM baccalaureate program competencies illustrates the role of HIM professionals in informatics, data analytics, and data use. More precisely, the competency subdomains clearly align with content in the STEM disciplines of science, math, and technology, and the individual tasks under each subdomain solidify the assertion that HIM is part of the STEM disciplines.

Published reports on STEM jobs of the future demonstrate that many HIM professionals are already employed in recognized STEM occupations, particularly in roles such as computer and information research scientists, database administrators, information security analysts, statisticians, and computer occupations.[26] Additionally, an analysis of the O*NET database, which allows researchers to perform searches for jobs based on STEM occupation characteristics, resulted in the finding that 26 of the 308 STEM occupations are related to HIM (see Table 2).

Some potential limitations of the results of this study should be noted. First, data were drawn from the self-reported AHIMA membership profile database. The information provided in membership profiles may be outdated or incomplete. Second, the data represent a small sample of HIM professionals within the larger AHIMA membership population. Although the sample size is small, we believe this sample is a solid demonstration of the future trend of the HIM profession.

Conclusion

The results of this study show that AHIMA members were qualified to be included in various STEM disciplines. Future study is needed to acquire more accurate and precise data on the job titles and STEM positions that are currently filled by HIM professionals. A future survey of the entire AHIMA membership is also needed to obtain additional information to expand other job titles related to STEM.

We recommend that AHIMA continue to promote the value that credentialing offers to members, as well as the career opportunities available in STEM technology fields. We also recommend that AHIMA consider adding the STEM vetted occupations to the membership database to more closely align the membership data with the vetted occupations that were considered in this study.

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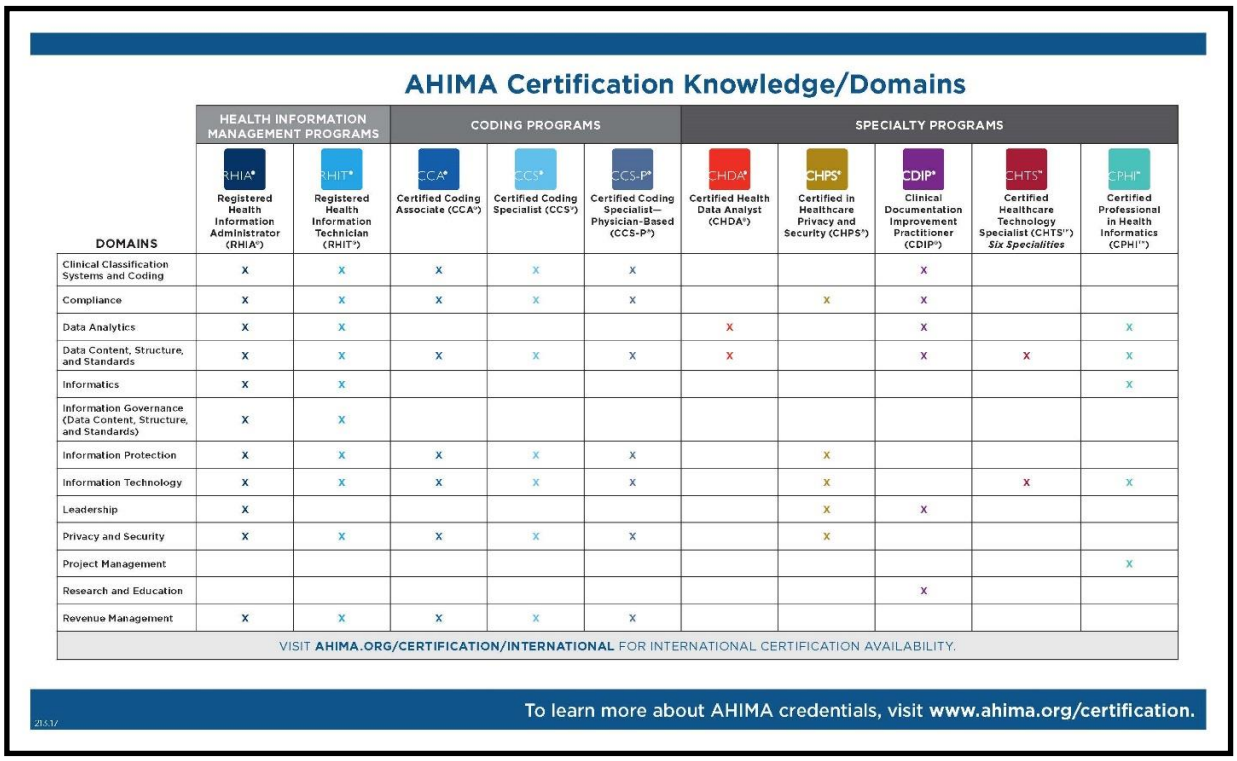
Figure 1

AHIMA Credentials and Certifications with Examples of STEM-Related Knowledge Domains



AHIMA Certification Knowledge/Domains

	HEALTH INFORMATION MANAGEMENT PROGRAMS		CODING PROGRAMS			SPECIALTY PROGRAMS				
DOMAINS	RHIA® Registered Health Information Administrator (RHIA®)	RHIT® Registered Health Information Technician (RHIT®)	CCA® Certified Coding Associate (CCA®)	CCS® Certified Coding Specialist (CCS®)	CCS-P® Certified Coding Specialist—Physician-Based (CCS-P®)	CHDA® Certified Health Data Analyst (CHDA®)	CHPS® Certified in Healthcare Privacy and Security (CHPS®)	CDIP® Clinical Documentation Improvement Practitioner (CDIP®)	CHTS® Certified Healthcare Technology Specialist (CHTS®) *Six Specialities*	CPHI® Certified Professional in Health Informatics (CPHI®)
Clinical Classification Systems and Coding	X	X	X	X	X			X		
Compliance	X	X	X	X	X		X	X		
Data Analytics	X	X				X		X		X
Data Content, Structure, and Standards	X	X	X	X	X	X		X	X	X
Informatics	X	X								X
Information Governance (Data Content, Structure, and Standards)	X	X								
Information Protection	X	X	X	X	X		X			
Information Technology	X	X	X	X	X		X		X	X
Leadership	X						X	X		
Privacy and Security	X	X	X	X	X		X			
Project Management										X
Research and Education								X		
Revenue Management	X	X	X	X	X					

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Table 1

O*NET Major Occupation Group Categories and the 26 Related HIM Occupations

O*NET Major Occupation Group Categories	**O*NET Code**	**Number of Related HIM Occupations**
Computer and Mathematical Occupations	15	18
Healthcare Practitioners and Technical Occupations	29	3
Management Occupations	11	2
Life, Physical, and Social Science Occupations	19	2
Architecture and Engineering Occupations	17	1

Table 2

O*NET/SOC Occupations and Occupation Types Related to HIM Professions

Code	Occupation	Occupation Types
19-1029.01	Bioinformatics Scientists	Research, Development, Design, and Practitioners
15-2041.01	Biostatisticians	Research, Development, Design, and Practitioners
15-1199.08	Business Intelligence Analysts	Research, Development, Design, and Practitioners
15-2041.02	Clinical Data Managers	Research, Development, Design, and Practitioners
11-9121.01	Clinical Research Coordinators	Managerial
15-1111.00	Computer and Information Research Scientists	Research, Development, Design, and Practitioners
11-3021.00	Computer and Information Systems Managers	Managerial
15-1143.00	Computer Network Architects	Research, Development, Design, and Practitioners
15-1152.00	Computer Network Support Specialists	Technologists and Technicians
15-1199.00	Computer Occupations, All Other	Research, Development, Design, and Practitioners
15-1131.00	Computer Programmers	Technologists and Technicians
15-1121.00	Computer Systems Analysts	Research, Development, Design, and Practitioners
15-1199.02	Computer Systems Engineers/Architects	Research, Development, Design, and Practitioners
15-1151.00	Computer User Support Specialists	Technologists and Technicians
29-2011.01	Cytogenetic Technologists	Technologists and Technicians
15-1199.07	Data Warehousing Specialists	Research, Development, Design, and Practitioners
15-1141.00	Database Administrators	Research, Development, Design, and Practitioners
15-1199.06	Database Architects	Research, Development, Design, and Practitioners
15-1199.12	Document Management Specialists	Research, Development, Design, and Practitioners
19-1041.00	Epidemiologists	Research, Development, Design, and Practitioners
29-2099.00	Health Technologists and Technicians, All Other	Technologists and Technicians
29-9099.00	Healthcare Practitioners and Technical Workers, All Other	Technologists and Technicians
17-2112.01	Human Factors Engineers and Ergonomists	Research, Development, Design, and Practitioners

15-1121.01	Informatics Nurse Specialists	Research, Development, Design, and Practitioners
15-1122.00	Information Security Analysts	Research, Development, Design, and Practitioners
15-1199.09	Information Technology Project Managers	Research, Development, Design, and Practitioners

Table 3

Results from the Job Title Keyword Search among AHIMA Members and STEM-related AHIMA Credential Holders

Keywords Searched in Job Title Field	Number of AHIMA Members	Number of CPHI Holders	Number of CHDA Holders	Number of CHPS Holders
Informatics	181	5	7	0
Computer	16	0	0	0
Technology	125	0	2	0
System Analyst	37	1	0	0
Database	19	0	0	0
Network	55	0	0	0
Business intelligence	18	2	1	0
Information security	18	0	0	6
Data	1,105	8	36	2

Appendix A
2014 AHIMA Entry Level Curricular Competencies for the Associate Level

Associate HIM Level Curriculum Map

Concepts to be interwoven throughout all levels of the curricula include:
- CRITICAL THINKING: For example the ability to work independently, use judgment skills effectively, be innovative by thinking outside of the box
- PERSONAL BRANDING: For example personal accountability, reliability, self-sufficiency

Entry Level Competency Student Learning Outcomes	Bloom's Level	Curricular Considerations
Domain I. Data Content Structure and Standards		
DEFINITION: Academic content related to diagnostic and procedural classification and terminologies; health record documentation requirements; characteristics of the healthcare system; data accuracy and integrity; data integration and interoperability; respond to customer data needs; data management policies and procedures; information standards.		
Subdomain I.A Classification Systems		

1. Apply diagnosis/procedure codes according to current guidelines	3	• Principles and applications of Classification Systems
		  ○ ICD/CPT, HCPCS, SNOMED, DSM
		• Taxonomies
		  ○ Healthcare data sets (OASIS, HEDIS, UHDDS, DEEDS)
		• Nomenclatures
		• Terminologies
		  ○ SNOMED
		• Clinical vocabularies

2. Evaluate the accuracy of diagnostic and procedural coding	5	• Principles and applications of classification, taxonomies, nomenclatures, terminologies, clinical vocabularies, auditing
3. Apply diagnostic/procedural groupings	3	• Principles and applications of diagnostic and procedural grouping • DRG, MSDRG, APC, RUGS
4. Evaluate the accuracy of diagnostic/procedural groupings	5	• Principles and applications of diagnostic and procedural grouping
Subdomain I.B. Health Record Content and Documentation		
1. Analyze the documentation in the health record to ensure it supports the diagnosis and reflects the patient's progress, clinical findings, and discharge status	4	• Content of health record • Documentation requirements of the health record • Health information media ○ Paper, computer, web-based document imaging
2. Verify the documentation in the health record is timely, complete, and accurate	4	• Documentation requirements of the health record for all record types • Acute, outpatient, LTC, rehab, behavioral health
3. Identify a complete health record	3	• Medical staff By-laws

according to, organizational policies, external regulations, and standards		• The Joint Commission, State statutes ○ Legal health record and complete health record
4. Differentiate the roles and responsibilities of various providers and disciplines, to support documentation requirements, throughout the continuum of healthcare	5	• Health Information Systems as it relates to the roles and responsibilities of healthcare providers • Administrative (patient registration, ADT, billing) and Clinical (lab, radiology, pharmacy)
Subdomain I.C. Data Governance		

1. Apply policies and procedures to ensure the accuracy and integrity of health data	3	• Data stewardship
		• Data and data sources for patient care
		  ○ Management, billing reports, registries, and/or databases
		• Data Integrity concepts and standards
		• Data Sharing
		• Data interchange standards
		  ○ X2, HL-7
		• Application of policies
		• By-laws
		  ○ Provider contracts with facilities, Medical staff By-laws, Hospital By-laws

Subdomain I.D. Data Management		
1. Collect and maintain health data	2	• Health data collection tools ○ Screen design, screens • Data elements, data sets, databases, indices • Data mapping • Data warehousing
2. Apply graphical tools for data presentations	3	• Graphical tools • Presentations
Subdomain I.E. Secondary Data Sources		
1. Identify and use secondary data sources	3	• Data sources primary/secondary ○ UHDDS, HEDIS, OASIS • Specialized data collection systems • Registries
2. Validate the reliability and accuracy of secondary data sources	3	• Principles and applications of secondary data sources
Domain II. Information Protection: Access Disclosure Archival Privacy and Security		
Definition: Understand healthcare law (theory of all healthcare law to exclude application of law covered in Domain V); develop privacy, security, and confidentiality policies, procedures and infrastructure; educate staff on health information protection methods; risk assessment; access and disclosure management.		
Subdomain II.A. Health Law		
1. Apply healthcare legal terminology	3	• Healthcare legal terminology
2. Identify the use of legal	3	• Health information/record laws and

documents		regulations ○ Consent for treatment, retention, privacy, patient rights, advocacy, health power of attorney, advance directives, DNR
3. Apply legal concepts and principles to the practice of HIM	3	• Maintain a legally defensible health record • Subpoenas, depositions, court orders, warrants
Subdomain II.B. Data Privacy Confidentiality and Security		
1. Apply confidentiality, privacy and security measures and policies and procedures for internal and external use and exchange to protect electronic health information	3	• Internal and external standards, regulations and initiatives ○ State and federal privacy and security laws • Patient verification ○ Medical identity theft • Data security concepts • Security processes and monitoring
2. Apply retention and destruction policies for health information	3	• Data storage and retrieval • E-Discovery • Information archival, data warehouses
3. Apply system security policies according to departmental and organizational data/information standards	3	• Security processes and policies ○ Data/information standards
Subdomain II.C. Release of Information		
1. Apply policies and procedures surrounding issues of access and disclosure of protected health information	3	• Release patient specific data to authorized users • Access and disclosure policies and procedures
Domain III. Informatics, Analytics and Data Use		
Definition: Creation and use of Business health intelligence; select, implement, use and manage technology solutions; system and data architecture; interface considerations; information management planning; data modeling; system testing; technology benefit realization; analytics and decision support; data visualization techniques; trend analysis; administrative reports; descriptive, inferential and advanced statistical protocols and analysis; IRB; research; patient-centered health information technologies; health information exchange; data quality		
Subdomain III.A. Health Information Technologies		
1. Utilize software in the completion of HIM processes	3	• Record tracking, release of information, coding, grouping, registries, billing, quality improvement, imaging, natural language processing, EHRs, PHRs, document imaging • EHR Certification (CCHIT) • Software application design and use ○ System testing and integration tools
2. Explain policies and procedures of networks, including intranet and Internet to facilitate clinical and administrative applications	2	• Communication and network technologies ○ EHR, PHR, HIEs, portals, public health, standards, telehealth

Subdomain III.B. Information Management Strategic Planning		
1. Explain the process used in the selection and implementation of health information management systems	2	• Strategic planning process • Integration of systems • Information management strategic plan • Corporate/Enterprise strategic plan
2. Utilize health information to support enterprise wide decision support for strategic planning	3	• Business planning, market share planning • Disaster and recovery planning
Subdomain III.C. Analytics and Decision Support		
1. Explain analytics and decision support	2	• Analytics and decision support o Data visualization, dashboard, data capture tools and technologies
2. Apply report generation technologies to facilitate decision-making	3	• Organizational design and strategic use of patient and performance data to support specific lines of business is healthcare o OPPS, IPPS, medical research
Subdomain III.D. Health Care Statistics		
1. Utilize basic descriptive, institutional, and healthcare statistics	3	• Mean, frequency, percentile, standard deviation • Healthcare statistical formulas o LOS, death, autopsy, infections, birth rates
2. Analyze data to identify trends	4	• Quality, safety, and effectiveness of healthcare • Structure and use of health information and healthcare outcomes o Individual comparative aggregate analytics
Subdomain III.E. Research Methods		
1. Explain common research methodologies and why they are used in healthcare	2	• Research methodologies o CDC, WHO, AHRQ o Quantitative, Qualitative, and mixed methods, IRB
Subdomain III.F. Consumer Informatics		
1. Explain usability and accessibility of health information by patients, including current trends and future challenges	2	• Mobile technologies, patient portals, patient education, outreach, patient safety, PHRs, patient navigation
Subdomain III.G. Health Information Exchange		
1. Explain current trends and future challenges in health information exchange	2	• Exchange/Sharing of health information o Employer to health provider, health provider to health provider, health provider to employer, facility to facility o HIE
Subdomain III.H. Information Integrity and Data Quality		

1. Apply policies and procedures to ensure the accuracy and integrity of health data both internal and external to the health system	3	• Quality assessment and improvement ○ Process, collection tools, data analysis, reporting techniques • Disease management process • Case management/care coordination
Domain IV. Revenue Management		
Definition: Healthcare reimbursement; revenue cycle; chargemaster; DOES NOT INCLUDE COMPLIANCE regulations and activities related to revenue management (coding compliance initiatives, fraud and abuse, etc.) AS THESE ARE COVERED IN DOMAIN V.		
Subdomain IV.A. Revenue Cycle and Reimbursement		

1. Apply policies and procedures for the use of data required in healthcare reimbursement	3	• Payment methodologies and systems
		  ○ Capitation, PPS, RBRVS, case mix, indices, MSDRGs, healthcare insurance policies, Accountable Care Organizations
		• Utilization review/management
		  ○ Case management

2. Evaluate the revenue cycle management processes	5	• Billing processes and procedures ○ Claims, EOB, ABN, electronic data interchange, coding, chargemaster, bill reconciliation process; hospital inpatient and outpatient, physician office and other delivery settings • Utilization review/management • Case management
Domain V. Compliance		
Definition: COMPLIANCE activities and methods for all health information topics. For example, how to comply with HIPAA, Stark Laws, Fraud and Abuse, etc.; coding auditing; severity of illness; data analytics; fraud surveillance; clinical documentation improvement.		
Subdomain V.A. Regulatory		
1. Analyze policies and procedures to ensure organizational compliance with regulations and standards	4	• Internal and External standards regulations and initiatives ○ HIPAA, ARRA, The Joint Commission, Quality Integrity Organizations, meaningful use • Risk management and patient safety
2. Collaborate with staff in preparing the organization for accreditation, licensure, and/or certification	4	• Accreditation, licensure, certification
3. Adhere to the legal and regulatory requirements related to the health information management	3	• Legislative and regulatory processes ○ Coding quality monitoring, compliance strategies, and reporting
Subdomain V.B. Coding		
1. Analyze current regulations and established guidelines in clinical classification systems	4	• Severity of illness systems ○ Present on admission • UHDDS guidelines

2. Determine accuracy of computer assisted coding assignment and recommend corrective action	5	• Coding specialty systems
Subdomain V.C. Fraud Surveillance		
1. Identify potential abuse or fraudulent trends through data analysis	3	• False Claims Act • Whistle blower, STARK, Anti Kickback, unbundling, upcoding • Role of OIG, RAC ○ Fraud/Abuse
Subdomain V.D. Clinical Documentation Improvement		
1. Identify discrepancies between supporting documentation and coded data	3	• Clinical outcomes measures and monitoring
2. Develop appropriate physician queries to resolve data and coding discrepancies	6	• AHIMA CDI toolbox • Professional communication skills • Clinical documentation improvements ○ Physician Role, HIM Role in CDI
Domain VI. Leadership		
Definition: Leadership models, theories, and skills; critical thinking; change management; workflow analysis, design, tools and techniques; human resource management; training and development theory and process; strategic planning; financial management; ethics and project management		
Subdomain VI.A Leadership Roles		
1. Summarize health information related leadership roles	2	• Leadership roles ○ Healthcare providers and disciplines

2. Apply the fundamentals of team leadership	3	• Team leadership concepts and techniques
		  ○ Future roles for HIM professionals
		  ○ C-Suite (within various healthcare settings, pharmaceutical companies, medical staff, hospital, clinic management, HR)
		• Business related partnerships

3. Organize and facilitate meetings	3	• Roles and functions of teams and committees ○ Work in teams/committees, consensus building • Communication and interpersonal skills • Critical thinking skills
Subdomain VI.B. Change Management		
1. Recognize the impact of change management on processes, people and systems	2	• Mergers • New systems and processes implementation ○ Risk Exposure
Subdomain VI.C. Work Design and Process Improvement		
1. Utilize tools and techniques to monitor, report, and improve processes	3	• Tools and techniques for process improvement/reengineering • Gantt chart, benchmarking and data presentation • Lean, Six Sigma

2 Identify cost-saving and efficient means of achieving work processes and goals	3	• Incident response • Medication reconciliation • Sentinel events
3. Utilize data for facility-wide outcomes reporting for quality management and performance improvement	3	• Shared governance
Subdomain VI.D. Human Resources Management		
1. Report staffing levels and productivity standards for health information functions	3	• Staffing levels and productivity standards • Productivity calculations
2. Interpret compliance with local, state, federal labor regulations	5	• Labor/Employment laws
3. Adhere to work plans, policies, procedures, and resource requisitions in relation to job functions	3	• HR structure and operations
Subdomain VI.E. Training and Development		
1. Explain the methodology of training and development	2	• Orientation and training • Content delivery and media
2. Explain return on investment for employee training/development	2	• Recruitment, retention, and right sizing
Subdomain VI.F. Strategic and Organizational Management		
1. Summarize a collection methodology for data to guide strategic and organizational management	2	• Strategic and organizational management • Workflow and process monitors • Resource allocation • Outcomes measures and monitoring • Corporate compliance and patient safety • Risk assessment • Customer satisfaction • Internal and external
2. Understand the importance of healthcare policy-making as it relates to the healthcare delivery system	2	• Healthy People 2020 • IOM reports • CDC • State, local and federal policies • PCORI
3. Describe the differing types of organizations, services, and personnel and their interrelationships across the health care delivery system	2	• Managed care organizations • ACO's • Payers/providers, all delivery settings • Payers' impact to each delivery setting • Biotech • Medical devices
4. Apply information and data strategies in support of information governance initiatives	3	• Information and data strategy methods and techniques • Data and information stewardship • Critical thinking skills
5. Utilize enterprise-wide	3	• Data and information models

information assets in support of organizational strategies and objectives		• Data/information visualization and presentation • Critical thinking skills
Subdomain VI.G. Financial Management		
1. Plan budgets	3	• Budgets ○ Staffing, department, capital
2. Explain accounting methodologies	2	• Accounting methodologies • Cost and cash accounting
3. Explain budget variances	2	• Budget variances
Subdomain VI.H. Ethics		
1. Comply with ethical standards of practice	5	• Professional and practice-related ethical issues • AHIMA Code of Ethics
2. Evaluate the consequences of a breach of healthcare ethics	5	• Breach of healthcare ethics
3. Assess how cultural issues affect health, healthcare quality, cost, and HIM	5	• Cultural competence • Healthcare professionals self-assessment of cultural diversity • Self-awareness of own culture • Assumptions, Biases, stereotypes
4. Create programs and policies that support a culture of diversity	6	• Diversity awareness training programs: age, race, sexual orientation, education, work experience, geographic location, disability • Regulations such as ADA, ACLU
Subdomain VI.I. Project Management		
1. Summarize project management methodologies	2	• Project management methodologies ○ PMP
Subdomain VI.J. Vendor/Contract Management		
1. Explain Vendor/Contract Management	2	• System acquisition and evaluation
Subdomain VI.K. Enterprise Information Management		
1. Apply knowledge of database architecture and design	3	• Data dictionary, interoperability
Supporting Body of Knowledge (Pre-requisite or Evidence of Knowledge)		
Pathophysiology and Pharmacology		
Anatomy and Physiology		
Medical Terminology		
Computer Concepts and Applications		

Bloom's Taxonomy

Revised for AHIMA Curricula Mapping

Taxonomy Level	Category	Definition	Verbs
1	Remember	Recall facts, terms, basic concepts of previously learned material	Choose, Define, Find
2	Understand	Determine meaning and demonstrate clarity of facts and ideas	Collect, Depict, Describe, Explain, Illustrate, Recognize, Summarize
3	Apply	Use differing methods, techniques and information to acquire knowledge and/or solve problems	Adhere to, Apply, Demonstrate, Discover, Educate, Identify, Implement, Model, Organize, Plan, Promote, Protect, Report, Utilize, Validate
4	Analyze	Contribute to the examination of information in part or aggregate to identify motives and causes	Analyze, Benchmark, Collaborate, Examine, Facilitate, Format, Map, Perform, Take part in, Verify
5	Evaluate	Make judgments in support of established criteria and/or standards	Advocate, Appraise, Assess, Compare, Comply, Contrast, Determine, Differentiate, Engage, Ensure, Evaluate, Interpret, Leverage, Manage, Mitigate, Oversee, Recommend
6	Create	Generate new knowledge through innovation and assimilation of data and information	Build, Compile, Conduct, Construct, Create, Design, Develop, Forecast, Formulate, Govern, Integrate, Lead, Master, Propose

The layout for the levels and categories was adapted from Lorin W. Anderson and David R. Krathwohl's *A Taxonomy for Learning, Teaching, and Assessing,* Abridged edition, Allyn and Bacon, Boston, MA, 2001.

Appendix B

2014 AHIMA Entry Level Curricular Competencies for the Baccalaureate Level

Baccalaureate Level HIM Curriculum Map

Concepts to be interwoven throughout all levels of the curricula include:

- CRITICAL THINKING: For example the ability to work independently, use judgment skills effectively, be innovative by thinking outside of the box
- PERSONAL BRANDING: For example personal accountability, reliability, self-sufficiency

Entry Level Competency Student Learning Outcomes	Bloom's Level	Curricular Considerations
Domain I. Data Content Structure and Standards		
DEFINITION: Academic content related to diagnostic and procedural classification and terminologies; health record documentation requirements; characteristics of the healthcare system; data accuracy and integrity; data integration and interoperability; respond to customer data needs; data management policies and procedures; information standards.		
Subdomain I.A. Classification Systems		
1. Evaluate, implement and manage electronic applications/systems for clinical classification and coding	5	• Encoders, Computer Assisted Coding, Systems Development Life Cycle
2. Identify the functions and relationships between healthcare classification systems	3	• Healthcare classification systems, taxonomies, and clinical vocabularies ○ ICD, CPT, SNOMED-CT, DSM

3. Map terminologies, vocabularies and classification systems	4	• Mapping from a standard clinical terminology to a HIPAA code set
		  ○ LOINC to CPT or SNOMED to ICD
		• Mapping from one code set to another code set
		  ○ One revision of ICD to another

4. Evaluate the accuracy of diagnostic and procedural coding	5	• Principles and applications of classification, taxonomies, nomenclatures, terminologies, clinical vocabularies, auditing
Subdomain I.B. Health Record Content and Documentation		
1. Verify that documentation in the health record supports the diagnosis and reflects the patient's progress, clinical findings, and discharge status	4	• Health record components ○ General requirements for documentation for all record types
2. Compile organization-wide health record documentation guidelines	6	• Standards and regulations for documentation ○ The Joint Commission, CARF, CMS • Health record documentation policies and procedures

3. Interpret health information standards	5	• Health information standards and regulations
Subdomain I.C. Data Governance		
1. Format data to satisfy integration needs	4	• Capture, structure, and use of health information • Interoperability
2. Construct and maintain the standardization of data dictionaries to meet the needs of the enterprise	6	• Data dictionary composition • Data sources
3. Demonstrate compliance with internal and external data dictionary requirements	3	• Accreditation standards ○ The Joint Commission, NCQA, CARF, CHAP, URAC Data, HL7, ASTM, HEDIS, ACS data standards
4. Advocate information operability and information exchange	5	• Generally accepted recordkeeping principles
Subdomain I.D. Data Management		
1. Analyze information needs of customers across the healthcare continuum	4	• Capture, structure, and use of health information
2. Evaluate health information systems and data storage design	5	• Storage media, disaster recovery, cloud computing
3. Manage clinical indices/databases/registries	5	• Secondary data sources, registries, and indices • Healthcare data sets ○ HEDIS, UHDDS, OASIS • Indices and registry policies
4. Apply knowledge of database architecture and design to meet organizational needs	3	• Database architecture and design • Data dictionary, data modeling, data warehousing
5. Evaluate data from varying sources to create meaningful presentations	5	• Presentation software • Healthcare data • Indices and registries
Subdomain I.E. Secondary Data Sources		
1. Validate data from secondary sources to include in the patient's record, including personal health records	3	• Data stewardship • Patient-centered health information technology • Secondary data sources, registries, and indices
Domain II. Information Protection: Access Disclosure Archival Privacy and Security		
Definition: Understand healthcare law (theory of all healthcare law to exclude application of law covered in Domain V); develop privacy, security, and confidentiality policies, procedures and infrastructure; educate staff on health information protection methods; risk assessment; access and disclosure management.		
Subdomain II.A. Health Law		
1. Identify laws and regulations applicable to health care	3	• Health information laws and regulations ○ HIPAA, The Joint Commission, State laws

		• Healthcare legal terminology • Centers for Medicare and Medicaid Services (CMS)
2. Analyze legal concepts and principles to the practice of HIM	4	• Legal principles • Legal health records
Subdomain II.B. Data Privacy Confidentiality and Security		
1. Analyze privacy, security and confidentiality policies and procedures for internal and external use and exchange of health information	4	• Patient verification and identity management policies • Privacy, confidentiality, security principles, policies and procedures, federal and state laws • E-Discovery

2. Recommend elements included in the design of audit trails and data quality monitoring programs	5	• Data security
		  ○ Audits, controls, data recovery e-security
		  ○ Disaster recovery planning
		  ○ Business continuity planning

3. Collaborate in the design and implementation of risk assessment, contingency planning, and data recovery procedures	4	• Health information archival and retrieval systems • Data security protection methods ○ Authentication, encryption, decryption, firewalls
4. Analyze the security and privacy implications of mobile health technologies	4	• Security threats of mobile device, healthcare delivery via mobile devices
5. Develop educational programs for employees in privacy, security, and confidentiality	6	• Education and training principles • Privacy and security laws and regulations, adult education strategies, training methods
Subdomain II.C. Release of Information		
1. Create policies and procedures to manage access and disclosure of personal health information	6	• Principles for releasing PHI • Required elements of an authorization
2. Protect electronic health information through confidentiality and security measures, policies and procedures	3	• Audit techniques and principles
Domain III. Informatics, Analytics and Data Use		
Definition: Creation and use of Business health intelligence; select, implement, use and manage technology solutions; system and data architecture; interface considerations; information management planning; data modeling; system testing; technology benefit realization; analytics and decision support; data visualization techniques; trend analysis; administrative reports; descriptive, inferential and advanced statistical protocols and analysis; IRB; research; patient-centered health information technologies; health information exchange; data quality		
Subdomain III.A. Health Information Technologies		
1. Utilize technology for data collection, storage, analysis, and reporting of information	3	• Health information archival and retrieval systems • Computer concepts

		○ Hardware components, network systems architecture operating systems and languages, software packages and tools, Cloud computing applications
2. Assess systems capabilities to meet regulatory requirements	5	• Electronic signatures, data correction, audit logs
3. Recommend device selection based on workflow, ergonomic and human factors	5	• Human factors and user interface design ○ PDAs, screen size, mobile carts, bedside terminals/point of care
4. Take part in the development of networks, including intranet and Internet applications	4	• Communication technologies ○ Network-LANS, WANS, WLANS, VPNs • Internet technologies ○ Intranet, web-based systems, standards SGML, XML
5. Evaluate system architecture, database design, data warehousing	5	• System testing • Interface management • Data relationships
6. Create the electronic structure of health data to meet a variety of end user needs	6	• Data, information and file structures ○ Data administration, data definitions, data dictionary, data modeling, data structures, data warehousing, database management systems
Subdomain III.B. Information Management Strategic Planning		
1. Take part in the development of information management plans that support the organization's current and future strategy and goals	4	• Corporate strategic plan, operation improvement planning, information management plans • Disaster and recovery planning
2. Take part in the planning, design, selection, implementation, integration, testing, evaluation, and support of health information technologies	4	• Systems development life cycle ○ Systems analysis, design, implementation, evaluation, maintenance, EHRs, HIEs, RECs
Subdomain III.C. Analytics and Decision Support		
1. Apply analytical results to facilitate decision-making	3	• Data visualization, power point, dashboards
2. Apply data extraction methodologies	3	• Data capture tools and technologies ○ Forms, computer screens, templates, other health record documentation tools clinical, financial, administrative • Healthcare statistical formulas ○ LOS, death, birth, infection rates
3. Recommend organizational action based on knowledge obtained from data exploration and mining	5	• Data exploration and mining

4. Analyze clinical data to identify trends that demonstrate quality, safety, and effectiveness of healthcare	4	• Statistical analysis on healthcare data
		• Descriptive statistics
		  ○ Mean, standard deviation, ranges, percentiles
		• Inferential statistics
		  ○ T-tests, ANOVA, regression analysis, reliability, validity
		• Epidemiological applications

5. Apply knowledge of database querying and data exploration and mining techniques to facilitate information retrieval	3	• SQL, Data exploration and mining • Data presentation standards and tools
6. Evaluate administrative reports using appropriate software	5	• SQL, Reporting tools
Subdomain III.D. Health Care Statistics		

1. Interpret inferential statistics	5	• Inferential statistics
		  ○ T-tests, ANOVA, regression analysis, reliability, validity
		• Computerized statistical packages
		  ○ SPSS, SAS

2. Analyze statistical data for decision making	4	• Statistical analysis on healthcare data • Descriptive statistics ○ Mean, standard deviation, ranges, percentiles • Data reporting and presentations techniques
Subdomain III.E. Research Methods		

1. Apply principles of research and clinical literature evaluation to improve outcomes	3	• Research design/methods
		  ○ Quantitative, qualitative, evaluative, mixed, outcomes
		• Literature search and evaluation
		• Knowledge-based research techniques
		  ○ Medline, CMS libraries, AHRQ, and other websites

2. Plan adherence to Institutional Review Board (IRB) processes and policies	3	• National guidelines regarding human-subjects research • IRB process • Research protocol data management
Subdomain III.F. Consumer Informatics		
1. Educate consumers on patient-centered health information technologies	3	• Patient centered medical homes • Patient portals, patient safety, patient education • Personal Health Record
Subdomain III.G. Health Information Exchange		
1. Collaborate in the development of operational policies and procedures for health information exchange	4	• HIE's, local, regional including providers, pharmacies, other health facilities

2. Conduct system testing to ensure data integrity and quality of health information exchange	6	• Integration, interfaces, and data reliability
3. Differentiate between various models for health information exchange	5	• RHIO, HIE
Subdomain III.H. Information Integrity and Data Quality		
1. Discover threats to data integrity and validity	3	• Intrusion detection systems, audit design and principle
2. Implement policies and procedures to ensure data integrity internal and external to the enterprise	3	• Authentication, encryption, password management
3. Apply quality management tools	3	• Control charts, Pareto charts, Fishbone diagrams and other Statistical Process Control techniques

4. Perform quality assessment including quality management, data quality, and identification of best practices for health information systems	4	• Data quality assessment and integrity
		• Disease management process
		  ○ Case management, critical paths, care coordination
		• Outcomes measurement
		  ○ Patient as patient, customer satisfaction, disease specific
		• Patient and organization safety initiatives

5. Model policy initiatives that influence data integrity	3	• Data quality Model • Characteristics of data integrity
Domain IV. Revenue Management		
Definition: Healthcare reimbursement; revenue cycle; chargemaster; DOES NOT INCLUDE COMPLIANCE regulations and activities related to revenue management (coding compliance initiatives, fraud and abuse, etc.) AS THESE ARE COVERED IN DOMAIN V.		
Subdomain IV.A. Revenue Cycle and Reimbursement		

1. Manage the use of clinical data required by various payment and reimbursement systems	5	• Clinical Data Management and reimbursement management
		• CaseMix Management
		• Payment systems
		  ○ PPS, DRGs, RBRVS, RUGs, Value Based Purchasing (VBP), MSDRGs, commercial, managed care, federal insurance plans
		  ○ Billing and reimbursement at hospital inpatient and outpatient, physician office and other delivery settings

2. Take part in selection and development of applications and processes for chargemaster and claims management	4	• Chargemaster management
3. Apply principles of healthcare	3	• Cost reporting, budget variances, budget

finance for revenue management		speculation
4. Implement processes for revenue cycle management and reporting	3	• CCI-Electronic Billing X12N • Compliance strategies and reporting • Audit process ○ Compliance and reimbursement • Revenue cycle process • Utilization and resource management
Domain V. Compliance		
Definition: COMPLIANCE activities and methods for all health information topics. For example, how to comply with HIPAA, Stark Laws, Fraud and Abuse, etc.; coding auditing; severity of illness; data analytics; fraud surveillance; clinical documentation improvement.		
Subdomain V.A. Regulatory		
1. Appraise current laws and standards related to health information initiatives	5	• Compliance strategies and reporting • Regulatory and licensure requirements • Elements of compliance programs • Patient safety
2. Determine processes for compliance with current laws and standards related to health information initiatives and revenue cycle	5	• Policies and procedures • Non-retaliation policies • Auditing and monitoring
Subdomain V.B. Coding		
1. Construct and maintain processes, policies, and procedures to ensure the accuracy of coded data based on established guidelines	6	• UHDDS, Federal compliance guidelines • Official coding guidelines from CMS, AMA, NCHVS, NCCI
2. Manage coding audits	5	• Audit principles and reporting
3. Identify severity of illness and its impact on healthcare payment systems	3	• Casemix • Computer assisted coding systems • Payment Systems ○ PPS, DRG, RBRVS, RUG, VBP, MSDRG, commercial, managed care, federal plans
Subdomain V.C. Fraud Surveillance		
1. Determine policies and procedures to monitor abuse or fraudulent trends	5	• Fraud detection
Subdomain V.D. Clinical Documentation Improvement		
1. Implement provider querying techniques to resolve coding discrepancies	3	• Query process, written, verbal and template queries, timeliness and interpretation, query retention
2. Create methods to manage Present on Admission, hospital acquired conditions, and other CDI components	6	• CDI concurrent, retrospective, post-bill review • CDI metrics and reporting process
Domain VI. Leadership		
Definition: Leadership models, theories, and skills; critical thinking; change management;		

workflow analysis, design, tools and techniques; human resource management; training and development theory and process; strategic planning; financial management; ethics and project management		
Subdomain VI.A Leadership Roles		
1. Take part in effective negotiating and use influencing skills	4	• Negotiation techniques
2. Discover personal leadership style using contemporary leadership theory and principles	3	• Professional development for self • Role of HIM in the C-Suite
3. Take part in effective communication through project reports, business reports and professional communications	4	• Process re-engineering and work redesign
4. Apply personnel management skills	3	• Communication and interpersonal skills • Emotional intelligence • People developer/staffing mentor • Negotiation • Leadership and governance
5. Take part in enterprise-wide committees	4	• Facilitation, networking, consensus building • Meetings with executive boards and other high level organization groups, interdisciplinary committees
6. Build effective teams	6	• Team/consensus building
Subdomain VI.B. Change Management		
1. Interpret concepts of change management theories, techniques and leadership	5	• Change Management • Mergers • Risk exposure • Organizational design • EHR implementation
Subdomain VI.C. Work Design and Process Improvement		
1. Analyze workflow processes and responsibilities to meet organizational needs	4	• Workflow reengineering, workflow design techniques
2. Construct performance management measures	6	• Benchmarking techniques ○ Productivity standards, report cards, dashboards
3. Demonstrate workflow concepts	3	• Swimlane diagrams • Use cases • Top down diagrams
Subdomain VI.D. Human Resources Management		
1. Manage human resources to facilitate staff recruitment, retention, and supervision	5	• Principles of human resources management ○ Recruitment, supervision, retention, counseling, disciplinary action
2. Ensure compliance with employment laws	5	• Employment laws, labor laws ○ Federal and state
3. Create and implement staff orientation and training programs	6	• Workforce education and training
4. Benchmark staff performance	4	• Labor trends, market analysis

data incorporating labor analytics		
5. Evaluate staffing levels and productivity, and provide feedback to staff regarding performance	5	• Performance standards • Professional development in self and others
Subdomain VI.E. Training and Development		
1. Evaluate initial and on-going training programs	5	• Information systems, clinical documentation improvement, compliance, prospective payment system changes • PPS, CDI, EHRs
Subdomain VI.F. Strategic and Organizational Management		
1. Identify departmental and organizational survey readiness for accreditation, licensing and/or certification processes	3	• Accreditation standards o The Joint Commission, NCQA, CARF, CHAP, URAC o Provider credentialing requirements o CMS Conditions of Participation
2. Implement a departmental strategic plan	3	• Strategic planning, critical thinking, benchmarking
3. Apply general principles of management in the administration of health information services	3	• Organizational structures and theory
4. Evaluate how healthcare policy-making both directly and indirectly impacts the national and global healthcare delivery systems	5	• Healthy People 2020 • IOM reports • CDC • State, local and federal policies • PCORI
5. Identify the different types of organizations, services, and personnel and their interrelationships across the health care delivery system	3	• Managed care organizations • ACOs • Payers/providers, all delivery settings • Payers' impact to each delivery setting • Biotech • Medical devices
6. Collaborate in the development and implementation of information governance initiatives	4	• Inter/intra-organizational team-building and leadership • Project management
7. Facilitate the use of enterprise-wide information assets to support organizational strategies and objectives	4	• Information management planning • Enterprise information management • Master data/information management
Subdomain VI.G. Financial Management		
1. Evaluate capital, operating and/or project budgets using basic accounting principles	5	• Budget process o Capital and operating o Staffing budgeting
2. Perform cost-benefit analysis for resource planning and allocation	4	• Accounting • Cost/benefit analysis o Outsourcing, acquisition
3. Evaluate the stages of the	5	• Content of and answers to a request for

procurement process		proposal, request for information and request for quotation
Subdomain VI.H. Ethics		
1. Comply with ethical standards of practice	5	• Professional ethics issues • Ethical decision making process • AHIMA Code of Ethics • Patient rights • Patient safety
2. Evaluate the culture of a department	5	• Cultural Diversity
3. Assess how cultural issues affect health, healthcare quality, cost, and HIM	5	• Cultural competence • Healthcare professionals self-assessment of cultural diversity • Self-awareness of own culture • Assumptions, Biases, stereotypes
4. Create programs and policies that support a culture of diversity	6	• Diversity awareness training programs: age, race, sexual orientation, education, work experience, geographic location, disability • Regulations such as ADA, ACLU
Subdomain VI.I. Project Management		
1. Take part in system selection processes	4	• RFI and RFP
2. Recommend clinical, administrative, and specialty service applications	5	• RFP vendor selection, electronic record, clinical coding
3. Apply project management techniques to ensure efficient workflow and appropriate outcomes	3	• GANTT Charts, benchmarking, risk analysis, team structure
4. Facilitate project management by integrating work efforts	4	• Issue tracking, facilitation techniques, opportunity costs • Project management
Subdomain VI.J. Vendor/Contract Management		
1. Evaluate vendor contracts	5	• System acquisition and evaluation • Contract management
2. Develop negotiation skills in the process of system selection	6	• System acquisition and evaluation
Subdomain VI.K. Enterprise Information Management		
1. Manage information as a key strategic resource and mission tool	5	• Information Management Plan, information as an asset
Supporting Body of Knowledge (Pre-requisite or Evidence of Knowledge)		
Pathophysiology and Pharmacology		
Anatomy and Physiology		
Medical Terminology		
Computer Concepts and Applications		
Statistics		

Bloom's Taxonomy

Revised for AHIMA Curricula Mapping

Taxonomy Level	Category	Definition	Verbs
1	Remember	Recall facts, terms, basic concepts of previously learned material	Choose, Define, Find
2	Understand	Determine meaning and demonstrate clarity of facts and ideas	Collect, Depict, Describe, Explain, Illustrate, Recognize, Summarize
3	Apply	Use differing methods, techniques and information to acquire knowledge and/or solve problems	Adhere to, Apply, Demonstrate, Discover, Educate, Identify, Implement, Model, Organize, Plan, Promote, Protect, Report, Utilize, Validate
4	Analyze	Contribute to the examination of information in part or aggregate to identify motives and causes	Analyze, Benchmark, Collaborate, Examine, Facilitate, Format, Map, Perform, Take part in, Verify
5	Evaluate	Make judgments in support of established criteria and/or standards	Advocate, Appraise, Assess, Compare, Comply, Contrast, Determine, Differentiate, Engage, Ensure, Evaluate, Interpret, Leverage, Manage, Mitigate, Oversee, Recommend
6	Create	Generate new knowledge through innovation and assimilation of data and information	Build, Compile, Conduct, Construct, Create, Design, Develop, Forecast, Formulate, Govern, Integrate, Lead, Master, Propose

The layout for the levels and categories was adapted from Lorin W. Anderson and David R. Krathwohl's *A Taxonomy for Learning, Teaching, and Assessing,* Abridged edition, Allyn and Bacon, Boston, MA, 2001.

Appendix C

2014 AHIMA Entry Level Curricular Competencies for the Graduate Level

Graduate Level HIM Curriculum Map

A significant change in approach is noted with this release of the curricula. The emphasis and measurement of success is with attainment of the Bloom's taxonomy level associated with the Student Learning Outcomes rather than the curricular considerations (which are examples of topics to be considered). When specific content is required it is part of the student learning outcome. With the pace of change in healthcare and HIM today, the curricular considerations may change with great frequency, but the student learning outcomes would remain consistent over longer periods of time.

Concepts to be interwoven throughout all levels of the curricula include:

- CRITICAL THINKING: For example the ability to work independently, use judgment skills effectively, be innovative by thinking outside of the box
- PERSONAL BRANDING: For example personal accountability, reliability, self-sufficiency

Student Learning Outcomes	Bloom's Level	Curricular Considerations
Domain I. Data Content Structure and Standards		
DEFINITION: Academic content related to diagnostic and procedural classification and terminologies; health record documentation requirements; characteristics of the healthcare system; data accuracy and integrity; data integration and interoperability; respond to customer data needs; data management policies and procedures; information standards.		
Subdomain I.A Classification Systems		
1. Interpret terminologies, vocabularies and classification systems	5	• SNOMED • LOINC • ICD • UMLS • Metadata • Primary and secondary uses
2. Construct examples of mapping of clinical vocabularies and terminologies to appropriate classification systems	6	• ICD-10-CM/PCS to ICD-11-CM/PCS • ICD-11-CM/PCS to SNOMED-CT • Mapping between disease classifications
Subdomain I.B. Health Record Content and Documentation		
1. Examine required documentation and record structures	4	• Accreditation requirements • Foundational concepts of the health record • Framework and content of the health record • Health record documentation requirements • Manual vs. electronic structure
Subdomain I.C. Data Governance		

1. Evaluate data integration needs	5	• Interoperability • HIEs • Legacy systems • Standardization of data dictionaries
2. Propose data interoperability and sharing policies, structures, and methods	6	• Evidence-based policy evaluations
3. Recommend data standard policies for interoperability and sharing	5	• NIEM (national information exchange model • HL7 • ASTM • HEDIS • OASIS • UHDDS • Meaningful use • RxNorm
Subdomain I.D. Data Management		
1. Develop data management policies	6	• Business analytics management • Clinical analytics management ○ Medical decision-making • Healthcare research analytics management
2. Evaluate data from varying sources to create meaningful presentations	5	• Building an effective presentation (background, objectives, methodology, outcomes) • Statistical literacy • Dissemination and Education • Partnerships • Crowd Sourcing
3. Design patient-centered health information systems	6	• Principles of data representation • Patient portals • PHRs • ACO's • Medical homes • Value-based purchasing • Patient centered outcomes research
4. Manage virtual network communications	5	• Cloud technologies/computing

Subdomain I.E Secondary Data Sources		

1. Compile data from secondary sources	6	• Data sources primary and secondary
		  ○ UHDDS, HEDIS, OASIS
		• Specialized data collection systems
		  ○ Data mapping, data warehousing

Domain II. Information Protection: Access, Disclosure, Archival Privacy and Security		
Definition: Understand healthcare law (theory of all healthcare law to exclude application of law covered in Domain V); develop privacy, security, and confidentiality policies, procedures and infrastructure; educate staff on health information protection methods; risk assessment; access and disclosure management.		

Subdomain II.A. Health Law		
1. Create regulatory policies based on health laws	6	• HIPAA • ARRA • HITECH • ACOs • Meaningful Use • E-discovery • Stark • Red Flag • ACA • GINA • Medicare/Medicaid • Other federal/state laws
Subdomain II.B. Data Privacy, Confidentiality and Security		
1. Design a privacy and security infrastructure	6	• Federal and state privacy and security laws and regulations • Risk assessment, evaluation, and management • Business continuity planning
Subdomain II.C. Release of Information		
1. Mitigate access and disclosure risks	5	• Case risk analysis, mitigation and management • Breach analysis and notification requirements
Domain III. Informatics, Analytics, and Data Use		
Definition: Creation and use of Business health intelligence; select, implement, use and manage technology solutions; system and data architecture; interface considerations; information management planning; data modeling; system testing; technology benefit realization; analytics and decision support; data visualization techniques; trend analysis; administrative reports; descriptive, inferential and advanced statistical protocols and analysis; IRB; research; patient-centered health information technologies; health information exchange; data quality		
Subdomain III.A. Health Information Technologies		
1. Evaluate use of data capture technologies	5	• Natural language processing (NLP) • Voice recognition • Document imaging
2. Construct information systems capabilities	6	• EHR certification (CCHIT) • m-Health • e-health • Telehealth • Software application design and use • System testing and integration tools
3. Design user-centric interfaces and portals	6	• Data entry • Data transfer • Data display • Human-computer interface design

		• Sociotechnical model
4. Propose use of artificial intelligence applications	6	• Machine learning • Expert systems • Robotics • CAC • Voice recognition
5. Evaluate systems life cycle concepts	5	• Principles of computer science • Systems assessment methods and tools • Systems planning, analysis and design • System performance evaluation
6. Propose the implementation of health information systems	6	• Ergonomic and human factor designs • Change management • EHR • PHR • Networking principles, methods and designs • Information systems landscape • System interfaces • Database conversions

7. Construct information architectural models	6	• Database design and administration
		• Data warehousing
		• Population databases
		• Secondary and derived databases
		• Legal health record
		• Designated data set
		• Programming languages
		  ○ SQL
		  ○ Java
		• Retention/archival strategies and policies

Subdomain III.B. Information Management Strategic Planning		
1. Create information systems to ensure compliance	6	• Regulatory, legal, accreditation and certification requirements
2. Propose policy development and advocacy	6	• Uses, protection and dissemination of health information
3. Develop strategic initiatives for information management systems and regulatory policies	6	• Environmental scanning • Strategic planning and management • Policy management
4. Appraise benefit realization of information technologies	5	• Return on investment • Cost-benefit analysis • Regulatory requirements • Quality improvement • Patient safety • Risk management
5. Engage key stakeholders in information systems	5	• Professional networking

planning		
Subdomain III.C. Analytics and Decision Support		
1. Design data sources for intelligence extraction	6	• Database clustering • Data mining preparation
2. Create business intelligence through data analytics	6	• Trend analysis • Predictive and prescriptive modeling and statistics • hypothesis generation • Forecast modeling
3. Create data visualization techniques	6	• Data presentation
Subdomain III.D. Health Care Statistics		
1. Interpret inferential statistics	5	• Inferential statistics ○ T-tests, ANOVA, regression analysis, reliability, validity • Computerized statistical packages • SPSS, SAS
2. Create statistical business models to leverage enterprise wide information assets	6	• Descriptive statistics • Inferential statistics • Data mining • Data analytics • Data modeling • Identify data for appropriate statistical testing and applications
Subdomain III.E. Research Methods		

1. Analyze principles of research and clinical literature evaluation to improve outcomes	4	• Research design/methods
		  ○ Quantitative, qualitative, evaluative, mixed, outcomes
		• Literature search and evaluation
		• Knowledge-based research techniques
		  ○ Medline, CMS libraries, AHRQ, and other websites
		• Epidemiology

2. Comply with research administrative processes and policies	5	• IRB • Other federal and state regulations
3. Create an evidence based practice body of knowledge	6	• Grant proposals • Research methods • Study Designs (qualitative and quantitative) • Research ethics and integrity • Social consciousness • Population databases ○ AHRQ • Public health
Subdomain III.F. Consumer Informatics		
1. Compare personalized	5	• Genomics

medicine models		• PHRs • PCORI • Consumer portals
Subdomain III.G. Health Information Exchange		

1. Develop policies for health information exchange (HIE)	6	• Information sharing
		  ○ HIE
		  ○ RHIO
		  ○ Health data banks
		  ○ Medical homes
		  ○ ACO's
		  ○ Information sharing

Subdomain III.H. Information Integrity and Data Quality		
1. Assess data integrity	5	• Threats to data integrity and validity
2. Oversee policies and technologies to protect data integrity	5	• Quality assessment and improvement • Data technologies • Information integrity policies
3. Conduct quality assessment studies	6	• Patient safety • PDSA models • Lean/Six Sigma models • Statistical process control techniques
Domain IV. Revenue Management		
Definition: Healthcare reimbursement; revenue cycle; chargemaster; DOES NOT INCLUDE COMPLIANCE regulations and activities related to revenue management (coding compliance initiatives, fraud and abuse, etc.) AS THESE ARE COVERED IN DOMAIN V.		
Subdomain IV.A. Revenue Cycle and Reimbursement		
1. Develop enterprise-wide strategic and operational planning models for revenue cycle management	6	• Value based purchasing • Evidence based outcomes • Patient satisfaction measurement
2. Forecast on-going regulatory impact on revenue cycle and enterprise-wide reimbursement	6	• Prescriptive and predictive analytics • Forecast modeling
3. Formulate healthcare reimbursement models	6	• Environmental scanning across healthcare settings • Global research model analysis
4. Oversee revenue cycle programs	5	• Coding and reimbursement principles and guidelines for hospital inpatient and outpatient, physician office and other delivery settings • Fraud surveillance • Chargemaster integrity • Decision support • Contract negotiation and management • Cost benefit analysis
Domain V. Compliance		

Definition: COMPLIANCE activities and methods for all health information topics. For example, how to comply with HIPAA, Stark Laws, Fraud and Abuse, etc.; coding auditing; severity of illness; data analytics; fraud surveillance; clinical documentation improvement.

Subdomain V.A. Regulatory		
1. Integrate data analytics for regulatory compliance measures	6	• Data mining • Statistics • Trend analysis presentation and communication
2. Formulate organizational compliance programs and policies	6	• Compliance strategies and policies • Risk management/Patient Safety • Risk analysis • Mitigation
3. Analyze standards and regulations in healthcare and how they drive and/or constrain operations	4	• HIPAA • FDA • Stark Laws • Other federal and state laws
Subdomain V.B. Coding		
1. Analyze current regulations and established guidelines in clinical classification systems and computer assisted coding applications	4	• Computer assisted coding standards • Regulatory impact analysis
Subdomain V.C. Fraud Surveillance		
1. Develop forensic models for fraud surveillance and improvement measures	6	• Trend analysis presentation and communication
Subdomain V.D. Clinical Documentation Improvement		
1. Formulate enterprise-wide CDI strategic and operational methods	6	• CDI standards • Regulatory impact analysis
Domain VI. Leadership		

Definition: Leadership models, theories, and skills; critical thinking; change management; workflow analysis, design, tools and techniques; human resource management; training and development theory and process; strategic planning; financial management; ethics and project management

Subdomain VI.A Leadership Roles		
1. Create health information related public policy	6	• Leadership roles • Healthcare providers and disciplines • Medical Staff Relationships
2. Evaluate executive decision-making	5	• Negotiation, mediation, arbitration skills • Communication skills • Critical thinking skills • Political navigation and intelligence skills • Social and emotional intelligence skills

		• Creative thinking skills • Entrepreneurship
3. Build and maintain strategic business alliances, networks, and partnerships	6	• Negotiation and communication skills
Subdomain VI. B. Change Management		
1. Master concepts of change management theories	6	• Leadership theory • Analytics
Subdomain VI.C. Work Design and Process Improvement		
1. Integrate data analytics to enhance workflow design and process improvement	6	• QI reengineering tools and methodologies • Human ergonomics and design • PMP
2. Design process improvement research methods and models	6	• PDSA • Six Sigma • DMAIC • Statistical Process Control
Subdomain VI.D. Human Resources Management		
1. Leverage human capital	5	• Leadership skills • Mentoring • Partnerships/Alliances • Networking • Professional development in self and others
Subdomain VI.E. Training and Development		
1. Develop enterprise-wide training and development research models and methods	6	• Professional development
Subdomain VI.F. Strategic and Organizational Management		
1. Create integrative health information analytics for effective enterprise-wide strategic planning	6	• Organizational systems thinking and theory • Contingency planning
2. Design enterprise-wide strategic planning research models and methods	6	• Performance improvement models • Application of business intelligence • Evidence based practice • Epidemiological research methods
3. Propose innovative healthcare policies which could directly or indirectly impact the national or global healthcare delivery system	6	• Healthy People 2020 • IOM reports • CDC • State, local and federal policies • PCORI
4. Compare the differing types of organizations, services, and personnel	5	• Managed care organizations • ACO's • Payers/providers, all delivery settings

and their interrelationships across the health care delivery system		• Payers' impact to each delivery setting • Biotech • Medical devices
5. Engage key stakeholders in information governance initiatives	5	• Professional networking • Marketing strategies • Strategic positioning • Negotiation skills • Political navigation skills
6. Leverage enterprise-wide information assets to enable achievement of organizational strategies and objectives	5	• Strategic information management planning • Enterprise information management • Information asset management
Subdomain VI.G. Financial Management		
1. Govern information assets	6	• Capitalization • Mergers and acquisitions • Entrepreneurship • Resource planning and forecasting • Value-based purchasing • Performance-based reimbursement • Healthcare economics • Accounting Principles • Data Licensing • Data use agreement
Subdomain VI.H. Ethics		
1. Create an ethical business culture	6	• Research ethics and integrity ○ CITI • Patient rights and advocacy • Social consciousness • Ethical decision making
2. Design ethical research models	6	• Evidence based practice • Research integrity • IRB
3. Evaluate ethical training and compliance programs and measures	5	• Surveys and questionnaires • Focus groups • Consumer engagement
4. Assess how cultural issues affect health, healthcare quality, cost, and HIM	5	• Cultural competence • Healthcare professionals self-assessment of cultural diversity • Self-awareness of own culture • Assumptions, Biases, stereotypes
5. Create programs and policies that support a culture of diversity	6	• Diversity awareness training programs: age, race, sexual orientation, education, work experience, geographic location, disability • Regulations such as ADA, ACLU

Subdomain VI.I. Project Management		
1. Assess project management tools	5	• LEAN • Six Sigma
2. Develop collaborative alliances and partnerships to effectively manage complex projects	6	• Professional networking • PMP Certification
3. Evaluate applied research tools and methods to integrate best practices in project planning and management	5	• Contingency Planning • Project Management principles
Subdomain VI.J. Vendor/Contract Management		
1. Master critical negotiation skills	6	• System acquisition and evaluation ○ RFI, RFP • Contract management process
2. Design comparative research models for vendor solutions	6	• Benchmarking
Subdomain VI.K. Enterprise Information Management		
1. Design enterprise-wide strategic planning and information management tools and resources for mission-critical business decisions	6	• Disaster planning • Business continuity planning • Enterprise-level information flows, • Health information source and receiver systems • Information and health information policy
2. Integrate business intelligence using appropriate analytic tools and methods	6	• Interoperability • Data analytics • Data mining
3. Develop enterprise-wide information business plans, strategic forecasts, and operational plans	6	• Quality of care promotion • Patient safety • Decision support
Supporting Body of Knowledge (Pre-requisite or Evidence of Knowledge)		
Pathophysiology and Pharmacology		
Anatomy and Physiology		
Medical Terminology		
Computer Concepts and Applications		
Statistics		

NOTE: The CEE is developing a research-focused graduate curriculum to provide direction to developing doctoral and research-based master's programs. It is expected that many of the learning outcomes on this upcoming map will over time be required for all graduate programs. To see a preview of the kinds of topics that are envisioned for the future, see Research Specific Student Learning Outcomes and Curricular Considerations. Programs that are already research-focused should include these learning outcomes now.

Bloom's Taxonomy

Revised for AHIMA Curricula Mapping

Taxonomy Level	Category	Definition	Verbs
1	Remember	Recall facts, terms, basic concepts of previously learned material	Choose, Define, Find
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4	Analyze	Contribute to the examination of information in part or aggregate to identify motives and causes	Analyze, Benchmark, Collaborate, Examine, Facilitate, Format, Map, Perform, Take part in, Verify
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Appendix D

Review of HIM Certification Tasks Demonstrating Alignment with STEM Occupations and Occupation Types

HIM Certification Tasks	STEM Occupations	STEM Occupation Types
CHPS Professionals - Identify different technology solutions such as break the glass to protect sensitive data sets	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Define processes for backing up systems with protected health information	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Identify processes and requirements for data restoration of different types of systems	Database Architects	Research, Development, Design, and Practitioners
CHPS Professionals - Conduct a system criticality analysis	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Define different solutions to safeguard protected health information such as instruction detection, encryption, audit logs	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Determine appropriate safeguards on different applications such as locked access after failed attempts and audit logs	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Become familiar with different types of solutions for clearing and purging data from hardware	Database Architects	Research, Development, Design, and Practitioners
CHPS Professionals - Create different audit programs to determine potential inappropriate access to protected health information	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Create an information security plan that encompasses both technical and physical safeguards established	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Establish appropriate processes for safeguarding protected health information while transmitted	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Define processes for secure	Information	Research,

transmission such as encryption, virtual private networks, secure connections, remote access	Security Analysts	Development, Design, and Practitioners
CHPS Professionals - Know different types of triggering systems such as intrusion detection, failed log ins, break the glass access, denial of service	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Identify different types of encryption	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Differentiate encryption for data at rest and data in motion	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Describe the process for encryption and decryption	Information Security Analysts	Research, Development, Design, and Practitioners
CHPS Professionals - Become familiar with the different types of encryption keys	Information Security Analysts	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of data models (conceptual, logical, and physical)	Database Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Basic knowledge of various architecture platforms (such as Oracle, SQL server)	Database Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of relational database structure (primary key, secondary key)	Database Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of electronic health record (EHR) systems	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of database language (SQL, XML, etc.)	Database Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Establish uniform definitions of data captured in source systems to create a reference tool (data dictionary)	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of applicable data	Database	Research,

standards (such as ASTM, CDISC, HL7)	Administrators	Development, Design, and Practitioners
CHDA Professionals - Knowledge of systems testing (integration, load, interface, user acceptance)	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - Evaluate existing data structures using data tables and field mapping to develop specifications that produce accurate and properly reported data	Computer Network Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Integrate data from internal or external sources in order to provide data for analysis or reporting	Computer Network Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Facilitate the update and maintenance of tables for an organization's information systems in order to ensure the quality and accuracy of the data	Computer Network Architects	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of industry-standard maps between classification systems	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Knowledge of appropriate use of data mining techniques	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Design metrics and criteria to meet the end users' needs through the collection and interpretation of data	Information Technology Project Managers	Research, Development, Design, and Practitioners
Source for rows below is the Health Data Analysis Toolkit, 2017, AHIMA:		
CHDA Professionals - Data mining to determine which value-based purchasing (VBP) metric is causing a reduction in a hospital's payment (from payers that pay for value and performance	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Design sampling plans for abstracted quality measures	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Specify data extract parameters for administrative data-driven measures	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Identify data problem areas and conduct research to determine best course of action	Database Administrators	Research, Development, Design, and Practitioners

CHDA Professionals - Analyze and solve issues with legacy, current, and planned systems as they relate to the integration and management of patient data (e.g., review for accuracy in record merge and unmerge processes)	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - Analyze reports of data duplicates or other errors to provide ongoing appropriate interdepartmental communication and monthly or daily data reports (e.g., related to the enterprise master patient index [EMPI])	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - Monitor metadata for process improvement opportunities (e.g., monitoring orders for successful computerized physician order entry [CPOE] implementation)	Clinical Data Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Identify, analyze, and interpret trends or patterns in complex data sets	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - Monitor data dictionary statistics	Database Administrators	Research, Development, Design, and Practitioners
CHDA Professionals - In collaboration with others, develop and maintain databases and data systems necessary for projects and department functions	Computer and Information Systems Managers	Managerial
CHDA Professionals - Acquire and abstract primary or secondary data from existing internal or external data sources	Computer and Information Research Scientists	Research, Development, Design, and Practitioners
CHDA Professionals - In collaboration with others, develop and implement data collection systems and other strategies that optimize statistical efficiency and data quality	Computer and Information Research Scientists	Research, Development, Design, and Practitioners
CHDA Professionals - Work collaboratively with data and reporting and the database administrator to help produce effective production management and utilization management reports in support of performance management related to utilization, cost, and risk with the various health plan data; monitor data integrity and quality of reports on a monthly basis	Computer and Information Research Scientists	Research, Development, Design, and Practitioners
CHDA Professionals - Develop and maintain claims audit reporting and processes	Document Management Specialists	Research, Development, Design, and Practitioners
CHDA Professionals - Develop and maintain contract models in support of contract negotiations with health plans	Document Management Specialists	Research, Development, Design, and

		Practitioners
CHDA Professionals - Develop, implement, and enhance evaluation and measurement models for the quality, data and reporting, and data warehouse department programs, projects, and initiatives for maximum effectiveness	Data Warehousing Specialists	Research, Development, Design, and Practitioners
CHDA Professionals - Work actively with information technology to select and/or develop tools to enable facility governance and leadership to monitor the progress of quality, patient safety, service, and related metrics continuously throughout the system	Information Technology Project Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Engage and collaborate with information technology and senior leadership to create and maintain a succinct report (e.g., dashboard), as well as a balanced set of system assessment measures, that conveys status and direction of key system-wide quality and patient safety initiatives for the trustee quality and safety committee and senior management; present this information regularly to the quality and safety committee of the board to ensure understanding of information contained therein	Information Technology Project Managers	Research, Development, Design, and Practitioners
CHDA Professionals - Lead analysis of outcomes and resource utilization for specific patient populations as necessary	Clinical Data Managers	Research, Development, Design, and Practitioners