

2012-2013 LONG SIGNATURE SHEET



UNC CHARLOTTE

Proposal Number: GRAD 02-12-13

Proposal Title: New Graduate Courses- Health Informatics Program

Originating Department: The Graduate School

TYPE OF PROPOSAL: UNDERGRADUATE _____ GRADUATE X _____ UNDERGRADUATE & GRADUATE _____
 (Separate proposals sent to UCCC and Grad. Council)

DATE RECEIVED	DATE CONSIDERED	DATE FORWARDED	ACTION	SIGNATURES
2/13/2013			Approved	<u>DEPARTMENT CHAIR</u> Mirsad Hadzikadic, Faculty Director
		3/25/13	Approved	<u>COLLEGE CURRICULUM COMMITTEE CHAIR</u> [print name here:] Heather Upford
			Approved	<u>COLLEGE FACULTY CHAIR (if applicable)</u> [print name here:] Dennis Livesy
		4/2/2013	Approved	<u>COLLEGE DEAN</u> Dr. Yi Deng
			Approved	<u>GENERAL EDUCATION</u> (if applicable; for General Education courses) [print name here:]
			Approved	<u>UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR</u> (for undergraduate courses only)
4-30-13	5-7-13	5-9-13	Approved	<u>GRADUATE COUNCIL CHAIR</u> (for graduate courses only) Rob Roy McGregor
				<u>FACULTY GOVERNANCE ASSISTANT</u> (Faculty Council approval on Consent Calendar)
				<u>FACULTY EXECUTIVE COMMITTEE</u> (if decision is appealed)

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2/13/2013			Approved	<u>DEPARTMENT CHAIR</u> Mirsad Hadzikadic, Faculty Director
2/13/13	3/20/13	3/21/13	Approved	<u>COLLEGE CURRICULUM COMMITTEE CHAIR</u> [print name here:] Shanti Kulkarni
3/21/2013	3/25/2013	3/26/2013	Approved	<u>COLLEGE FACULTY CHAIR (if applicable)</u> [print name here:] Jane B. Neese
3/21/2013	3/25/2013	3/26/2013	Approved	<u>COLLEGE DEAN</u> Dr. Nancy Fey-Yensan / Jane B. Neese
			Approved	<u>GENERAL EDUCATION</u> (if applicable; for General Education courses) [print name here:]
			Approved	<u>UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR</u> (for undergraduate courses only)
4-30-13	5-7-13	5-9-13	Approved	<u>GRADUATE COUNCIL CHAIR</u> (for graduate courses only)
				<u>FACULTY GOVERNANCE ASSISTANT</u> (Faculty Council approval on Consent Calendar)
				<u>FACULTY EXECUTIVE COMMITTEE</u> (if decision is appealed)

New Graduate Course and Curriculum Proposal from The Graduate School

Title: Establishment of new courses that were specified as part of required curricular structure for the approved M.S in Health Informatics Program

II. Proposal Content

A. Proposal Summary

The Graduate School proposes to add four new courses to the graduate curriculum: HCIP 5370, HCIP 5375, HCIP 5376, and HCIP 6380.

B. Justification

1. Need – These courses were specified as part of the approved M.S. in Health Informatics (HIPSM) program curricular structure for formal establishment upon approval of the program. The program was approved to start in Fall 2012. These courses are part of the core curricular structure and must now be formally established as regular offerings to enable program students to meet coursework requirements.
2. Prerequisites/Corequisites – These courses are starting points in the Foundation tracks and core. They require only a pre-requisite of enrollment in a Health Informatics graduate degree or certificate program.
3. Course Numbering – The 5000 level numbering (5370, 5373, 5376) is for foundation track courses. These enable students with an undergraduate degree in one of the complementary areas of health or computing to acquire foundational knowledge in the other area as preparation for the M.S. program core. These courses provide foundational content that is not at a “higher” level than advanced undergraduate courses in the same discipline. The 6000 level numbering (6380) is for a core Master’s level course.
4. Improvement – The courses are required to offer the core curricular structure of the program.
5. Previous Offering – HCIP 5370 and HCIP 5375 were previously offered once each in Fall 2012 with an enrollment of 10 students each. HCIP 5376 and HCIP 6380 are being offered in Spring 2013, with respective enrollments of 16 and 26 students.

C. Impact

Impacts of course development were previously considered as part of the approval process for the HIPSM M.S. degree program. These courses are necessary to fully implement the approved curricular structure of the program.

1. Student Constituency – The groups of students served by the courses are primarily graduate majors in the program. The 5000 level courses target M.S. program students that require foundational background in health or computing. The 6000 level course is core for all M.S. program students. Students in the Health Informatics Graduate Certificate program may also be able to take advantage of these courses to meet elective requirements.
2. Effect on Existing Courses and Curricula
 - a. Offering – HCIP 5370 and HCIP 5375 are each expected to be offered as one section every academic year in the Fall semester. HCIP 5376 and HCIP 6380 are each expected to be offered as one section every academic year in the Spring semester.
 - b. Affect on Other Course Offering – The proposed courses primarily support the foundation and core structure of the new Health Informatics M.S. degree. They are required for that program, and so do not significantly affect other offerings within the program. The proposed courses may be applicable as electives for the graduate certificate program in Healthcare Information Technology, but will not impact certificate course offerings, as certificate electives are already drawn from regular course offerings that are not primary to the certificate program itself. The proposed courses are not specifically intended as a complement or replacement for existing offerings in other programs. As such, they are not expected to significantly impact existing course offerings for other programs.
 - c. Anticipated Enrollment – In line with HIPSM program enrollment projections for the first four years, foundation course enrollment is expected to grow to an average of 15-20 students, and core course enrollment is expected to grow to an average of 30-35 students.
 - d. Affect on Enrollment in other Courses – Since the proposed courses are (1) required as foundational / core for and (2) target only students within the HIPSM program, the proposed courses are not expected to have a significant impact on enrollment in other courses.
 - e. Other Areas of Catalog Copy Affected – None. Catalog copy for the proposed courses was approved as part of the HIPSM M.S. degree establishment.

III. Resources Required To Support Proposal

The proposed courses are part of the approved curricular structure for the M.S. in Health Informatics program. Resource requirements were considered as part of the program approval.

A. Personnel

Per the HIPSM M.S. program approval, in the first four years of the program there are no expected additional requirements for new faculty, part-time teaching, student assistants and/or increased load on present faculty.

List by name qualified faculty members interested in teaching the course(s).

Yaorong Ge
Tricia Hubbard Turner

B. Physical Facility

Per the HIPSM M.S. program approval, adequate space is expected to be available for offering the courses.

C. Equipment And Supplies

Per the HIPSM M.S. program approval, it is not expected that additional special equipment or supplies will be required to offer these foundational courses.

D. Computer

Per the HIPSM M.S. program approval, it is not expected that significant additional or specialized computer usage will be required by students and/or faculty beyond existing campus computing facilities. Foundational coursework in health is more conceptual and is served by standard office suite software. Foundational coursework in computing is expected to be served by existing software development packages and computing laboratories that serve current foundational computing courses.

E. Audio-Visual

It is expected that the courses will be fully served by existing classroom audio/visual infrastructure.

F. Other Resources.

None required, per the HIPSM M.S. program approval.

G. Source Of Funding

None required, per the HIPSM M.S. program approval.

IV. Consultation With The Library And Other Departments Or Units

A. Library Consultation – Written consultation with the Library Reference Staff was made to ensure that library holdings are adequate to support the proposal. See attached Consultation on Library Holdings.

B. Consultation With Other Departments Or Units – The following departments/units were consulted in writing regarding all elements outlined in II.C.

- College of Computing and Informatics
 - Prior to being sent to the college's Curriculum Committee, multiple faculty members were engaged in review and revision of the proposal including Dr. David Wilson, Dr. Mirsad Hadzikadic, Dr. Yaorong Ge, and Dr. Bei Tseng Chu.
- College of Health and Human Services
 - Prior to being sent to the college's Curriculum Committee, multiple faculty members were engaged in review and revision of the proposal including Dr. Michael Thompson, and Dr. Andrew Harver.

V. Initiation, Attachments And Consideration Of The Proposal

A. Originating Unit

Briefly summarize action on the proposal in the originating unit including information on voting and dissenting opinions.

B. Credit Hour

The appropriate faculty committee has reviewed the course outline/syllabus and has determined that the assignments are sufficient to meet the University definition of a credit hour.

C. Attachments

1. Consultation – Attached.
2. Course Outline / Syllabus – Attached.
3. Proposed Catalog Copy – Attached as part of each individual course syllabus.
4. Academic Plan Of Study (Undergraduate Only) – N/A
5. Student Learning Outcomes – The proposed courses do not currently support SLOs. This curricular change does not require a change in SLOs or assessment for the degree program.
6. Textbook Costs – Electronic textbooks, textbook rentals, and the buyback program have been considered for the proposed courses, but remain the purview of the faculty member offering the course.



UNC CHARLOTTE
J. Murrey Atkins Library

Consultation on Library Holdings

To: Joshua Hertel
From: John Norris, Atkins Library, Information Commons
Date: March 14, 2013
Subject: HCIP 5370 Health Vocabularies and Classification Systems

Summary of Librarian's Evaluation of Holdings:

Evaluator: John Norris **Date:** March 14, 2013

Please Check One:

- Holdings are superior _____
- Holdings are adequate X
- Holdings are adequate only if Dept. purchases additional items. _____
- Holdings are inadequate _____

Comments:

Resources are adequate for this program with the stipulation that current journal subscriptions be maintained.

Evaluator's Signature

Date



UNC CHARLOTTE
J. Murrey Atkins Library

Consultation on Library Holdings

To: Joshua Hertel
From: John Norris, Atkins Library, Information Commons
Date: March 14, 2013
Subject: HCIP 6380 Introduction to Health Informatics

Summary of Librarian's Evaluation of Holdings:

Evaluator: John Norris **Date:** March 14, 2013

Please Check One:

- Holdings are superior _____
- Holdings are adequate X
- Holdings are adequate only if Dept. purchases additional items. _____
- Holdings are inadequate _____

Comments:

Resources are adequate for this program with the stipulation that current journal subscriptions be maintained and book collection is updated regularly.

Evaluator's Signature

Date



UNC CHARLOTTE
J. Murrey Atkins Library

Consultation on Library Holdings

To: Joshua Hertel
From: John Norris, Atkins Library, Information Commons
Date: March 14, 2013
Subject: HCIP 5375 Computer Vocabulary and Programming Systems

Summary of Librarian's Evaluation of Holdings:

Evaluator: John Norris **Date:** March 14, 2013

Please Check One:

- Holdings are superior _____
- Holdings are adequate X
- Holdings are adequate only if Dept. purchases additional items. _____
- Holdings are inadequate _____

Comments:

Resources are adequate for this program with the stipulation that current journal subscriptions be maintained and book collection is updated regularly.

Evaluator's Signature

Date



UNC CHARLOTTE
J. Murrey Atkins Library

Consultation on Library Holdings

To: Joshua Hertel
From: John Norris, Atkins Library, Information Commons
Date: March 14, 2013
Subject: HCIP 5376 Introduction to Programming for Health Informatics

Summary of Librarian's Evaluation of Holdings:

Evaluator: John Norris **Date:** March 14, 2013

Please Check One:

- Holdings are superior _____
- Holdings are adequate X
- Holdings are adequate only if Dept. purchases additional items. _____
- Holdings are inadequate _____

Comments:

Resources are adequate for this program with the stipulation that current journal subscriptions be maintained and book collection is updated regularly.

Evaluator's Signature

Date

Health Informatics

- **M.S. in Health Informatics**
- **Graduate Certificate in Healthcare Information Technology**

Professional Science Master's Degree in Health Informatics

hi.uncc.edu

Graduate Certificate in Healthcare Information Technology

hit.uncc.edu

The program in Health Informatics is a joint venture between the College of Computing and Informatics, the College of Health and Human Services, and the Graduate School. The program offers both a Certificate and a Master of Science degree designed to prepare students for the complex and rapidly changing healthcare and technology sectors.

Faculty Director

Dr. Mirsad Hadzikadic
343-A Woodward Hall

Graduate Program Director

Joshua Hertel, Graduate School
Denny 212
704-687-8763

College of Computing and Informatics

cci.uncc.edu

College of Health and Human Services

health.uncc.edu

Graduate School

graduateschool.uncc.edu

Deans

Dr. Yi Deng, College of Computing and Informatics
Dr. Nancy Fey-Yensan, College of Health and Human Services
Dr. Tom Reynolds, Graduate School

Graduate Faculty

Computer Science

~~Srinivas Akella, Associate Professor~~
~~William Ribarsky, Professor~~
~~Wensheng Wu, Assistant Professor~~

Kinesiology

~~Tricia Hubbard-Turner, Associate Professor~~

Nursing

~~Sonya Hardin, Associate Professor~~
~~Lueille Travis, Professor~~

Public Health Sciences

~~Ahmed A. Arif, Associate Professor~~
~~Christopher Blanchette, Adjunct Associate Professor~~
~~William Brandon, Adjunct Professor~~

Comment [D1]: Editorial: Listing (or not) of participating faculty members in the catalog varies by unit/program. The interdisciplinary program draws on several units/departments. Given potential fluctuations in participating faculty across stakeholder units, the maintenance to accuracy / value ratio of the listing is low.

Larissa R. Brunner Huber, Associate Professor
John Fisher, Research Assistant Professor
Andrew Harver, Professor
James N. Laditka, Associate Professor
Sarah B. Laditka, Associate Professor
Elena A. Platonova, Assistant Professor
William B. Saunders, Associate Graduate Faculty
James Studnicki, Professor
Stephen L. Wagner, Associate Graduate Faculty

Software and Information Systems

Bei Tseng Chu, Professor
Yorrong Ge, Associate Professor
Mirsad Hadzikadic, Professor
Celine Latulipe, Associate Professor
Heather Lipford, Assistant Professor
Anita Raja, Associate Professor
Mohamed Shehab, Assistant Professor
William Tolone, Associate Professor
Weichao Wang, Assistant Professor
Yongge Wang, Associate Professor
David Wilson, Associate Professor
Xintao Wu, Professor
Yuliang Zheng, Professor

M.S. IN HEALTH INFORMATICS

The Professional Science Master's (PSM) program in Health Informatics is an interdisciplinary program focused on the complex issues surrounding the management and analysis of electronic medical information. The program is designed to develop future leaders in the areas of health data management and analysis, including programming, security, health information exchange and healthcare analytics. Graduates of the PSM in Health Informatics will earn an M.S. in Health Informatics and be prepared to meet the urgent need for professionals capable of creating, implementing, evaluating, and modifying the next generation of medical information systems.

Admission Requirements

Applicants must meet the general Graduate School requirements for admission to Master's Degree programs. Applications must include all of the materials listed by the Graduate School as typical for Master's Degree application submissions. In addition to the general requirements for admission to the Graduate School, the following are required for study toward the M.S. in Health Informatics. The minimum admission requirements for the program are:

- An earned baccalaureate degree from an accredited college or university in computer sciences, health sciences, information systems, or life sciences or in an informatics discipline or a closely related field
- 1) A minimum undergraduate GPA of 3.0
- 2) Acceptable scores on the verbal, quantitative, and analytical sections of the GRE
- 3) Positive letters of recommendation
- 4) A statement of purpose outlining the goals for pursuing a graduate education in health information systems
- 5) A minimum TOEFL score of 220 (computer-based), 557 (paper-based), or 83 (Internet-based) or a minimum IELTS band score of 6.5 is required from any applicant whose native language is not English
- 6) Other credentials as required by the Graduate School

Documents to be submitted for admission:

- 1) Official transcripts from all colleges and universities attended
- 2) Official GRE scores
- 3) Official TOEFL or IELTS scores
- 4) UNC Charlotte application for graduate admission form
- 5) Three letters of recommendation

Comment [D2]: Editorial: The only difference between these and standard graduate school requirements is the base degree. Repetition introduces the potential for inaccuracy. Reference to the base requirements instead.

Degree Requirements

The PSM in Health Informatics program requires 39-48 graduate credit hours, including 9-18 hours of Foundation courses, 18 hours of Core courses, 9 hours of Concentration courses, and 3 hours of Internship/Practicum. There are four specialty Concentrations:

Programmer & Software Engineer
Health Information Privacy and Security Specialist
Health Information Management (HIM)/Exchange Specialist
Health Analyst

A minimum of 24 credit hours contributing to the M.S. in Health Informatics must be from courses numbered 6000 or higher. A maximum of 6 hours of graduate credit may be transferred. Students may apply all of the credits earned in the Graduate Certificate in Healthcare Information Technology towards the M.S. in Health Informatics.

Core Requirements

Foundation Courses

Students with an adequate informatics background will take the “Foundations in Health” course sequence. Similarly, students with an adequate healthcare background will take the “Foundations in Informatics” course sequence. In all cases a minimum of 9 credit hours of Foundations courses are required.

Foundations in Health

HCIP 5370 Health Vocabularies and Classification Systems (3)
HCIP 6100 Introduction to the US Healthcare System (3)
HCIP 6134 Quality and Outcomes Management in Healthcare (3)

Foundations in Informatics

HCIP 5375 Computer Vocabularies and Programming Systems (3)
HCIP 5376 Introduction to Programming for Health Informatics (3)
HCIP 5160/6160 Database Systems for Health Informatics (3)

The adequacy of a student’s background is determined by the Graduate Program Director. Students who are determined by the Graduate Program Director to lack an adequate background in informatics as well as health will be required to take courses from both Foundation sequences (Foundation General) for a maximum of up to 18 hours.

Core Courses

All students complete six required Core courses (18 hours) that provide a strong general background in health informatics, security, management, leadership, and statistics in preparation for more advanced Concentration courses.

HCIP 6108 Decision Analysis in Healthcare (3)
HCIP 6201 Computer Security, Privacy, and Legal Issues (3)
HCIP 6228 Medical Informatics (3)
HCIP 6342 Information Technology Project Management (3)
HCIP 6380 Introduction to Health Informatics (3)
HCIP 6385 Healthcare Communication and Leadership (3)

Concentration Requirements

Each student must also complete an approved concentration area consisting of nine (9) credit hours. Concentration areas [and applicable courses](#) include:

Programmer and Software Engineer (~~9 hours~~) – Students in this concentration design and develop advanced health IT solutions creating systems that meet the unique needs and exacting standards of the healthcare industry.

HCIP 5166 Network-Based Application Development (3)
HCIP 6070 Current Issues in Health Informatics (3)
HCIP 6112 Software System Design and Implementation (3)
HCIP 6162 Knowledge Discovery in Databases (3)
HCIP 6350 Principles of Human-Computer Interaction (3)
HCIP 6390 Advanced Programming for HI (3)

HCIP 6391 Architecting HI Systems (3)
HCIP 6392 Enterprise Health Information Systems (3)
HCIP 6410 Personalization and Recommender Systems (3)

Health Information Management and Exchange Specialist ~~(9 hours)~~ — Students in this concentration focus on the collection, management, and efficient transfer of medical information across multiple platforms.

HCIP 6070 Current Issues in Health Informatics (3)
HCIP 6134 Quality and Outcomes Management in Healthcare (3)*
HCIP 6146 Information Resources Management (3)
HCIP 6150 Health Law and Ethics (3)
HCIP 6199 Principles of Computer Networks and Databases (3)
HCIP 6330 Medical Practice Management (3)
HCIP 6392 Enterprise Health Information Systems (3)
HCIP 6393 Advanced Health Data Integration with Lab (3)

Health Information Privacy and Security Specialist ~~(9 hours)~~ — Students in this concentration specialize in the secure exchange and storage of confidential electronic health records.

HCIP 5220 Vulnerability Assessment and System Assurance (3)
HCIP 5250 Computer Forensics (3)
HCIP 6070 Current Issues in Health Informatics (3)
HCIP 6134 Quality and Outcomes Management in Healthcare (3)*
HCIP 6167 Network Security (3)
HCIP 6200 Principles of Information Security and Privacy (3)
HCIP 6210 Access Control & Security Architecture (3)
HCIP 6230 Information Infrastructure Protection (3)
HCIP 6240 Applied Cryptography (3)

Health Analyst ~~(9 Hours)~~ — Students in this concentration are responsible for analyzing health data to identify risk and to adopt best practices.

HCIP 6070 Current Issues in Health Informatics (3)
HCIP 6104 Health and Disease (3)
HCIP 6134 Quality and Outcomes Management in Healthcare (3)*
HCIP 6146 Information Resources Management (3)
HCIP 6150 Health Law and Ethics (3)
HCIP 6162 Knowledge Discovery in Databases (3)
HCIP 6163 Data Warehousing (3)
HCIP 6260 Analytic Epidemiology (3)
HCIP 6330 Medical Practice Management (3)
HCIP 6393 Advanced Health Data Integration with Lab (3)

~~A course cannot be used to satisfy both a Foundation and a Concentration requirement toward the degree. *This course cannot be used to satisfy both a Foundation and a Concentration requirement.~~

Other concentration areas may be possible with the approval of the Graduate Program Director. In addition, the Graduate Program Director may approve substitution of courses within approved concentration areas.

Capstone Project/Internship

In line with the practice-based nature of the program, all students must complete an approved Capstone Project/Internship experience from one of the following:

HCIP 6198 IT Internship Project (3)
HCIP 6400 Internship (3)

Other Requirements

~~At UNC Charlotte, courses having 5000 numbers are open to graduate students. Courses with 6000, 7000, and 8000 numbers are open to graduate students only. A minimum of 24 credit hours presented towards an M.S. in Health Informatics~~

~~degree must be numbered 6000 or higher.~~

- ~~• A student in the PSM in Health Informatics program must maintain a minimum GPA of 3.0 for continued enrollment in the program. Accumulation of three C grades will result in the suspension of the student's enrollment in the program. Accumulation of one U grade will result in the suspension of the student's enrollment in the program.~~
- ~~• Up to six hours of approved coursework may be transferred from regionally accredited master's or doctoral programs. Only courses in which the student earned a grade of B or above may be transferred.~~
- ~~• Time limits to complete the program are described in the *Graduate Catalog*: "University policy requires that no course listed on a master's student's candidacy form be older than six years at the time of graduation." Courses that exceed this time limit must be revalidated or retaken, whichever the graduate program decides necessary, if they are to count towards the degree.~~

GRADUATE CERTIFICATE IN HEALTHCARE INFORMATION TECHNOLOGY

The Graduate Certificate in Healthcare Information Technology (HIT) is designed to train individuals in the management of health and medical information and its secure exchange between consumers and providers. The certificate requires twelve (12) credit-hours of coursework and a three (3) credit-hour internship, for a total of fifteen (15) graduate credit hours. The certificate may be pursued concurrently with a related graduate degree program at UNC Charlotte. Students may apply all of the credits earned in the HIT Certificate towards the M.S. in Health Informatics.

Admission Requirements

Applicants must meet the general Graduate School requirements for admission to Graduate Certificate programs. Applications must include all of the materials listed by the Graduate School as typical for Graduate Certificate application submissions. In addition to the general requirements for admission to the Graduate School, the following are required for study toward the Graduate Certificate in Healthcare Information Technology.

For admission into the certificate program, applicants must meet the following requirements:

- 1) A bachelor's degree in a related field, including, but not limited to, a life science, health science, health administration, business administration, or computing discipline.
- ~~2) An undergraduate GPA of 3.0 or above~~
- ~~3) Knowledge of applications of information technology, including an understanding of computers, database management, and basic programming skills. The adequacy of a student's background is determined by the Graduate Program Director.~~
- ~~4) A statement of purpose outlining the goals for pursuing a graduate education in health information systems~~

Note: The GRE is not required for admission to the Graduate Certificate in HIT.

Program Requirements

The following two courses comprise the required core:

- HCIP 6201 Computer Security, Privacy, and Legal Issues (3)
- HCIP 6100 Introduction to the US Healthcare System (3)

One additional informatics course from the following list of electives is required:

- HCIP 5160 Applied Database (3)
- HCIP 5166 Network-Based Application Development (3)
- HCIP 5375 Computer Vocabularies and Programming Systems (3)
- HCIP 5376 Introduction to Programming for Health Informatics (3)
- HCIP 6160 Database Systems (3)
- HCIP 6163 Data Warehousing (3)
- HCIP 6162 Knowledge Discovery in Databases (3)
- HCIP 6350 Principles of Human-Computer Interaction (3)
- HCIP 6410 Personalization and Recommender Systems (3)

One additional health administration course from the following list of electives is required:

HCIP 5370 Health Vocabularies and Classification Systems (3)
HCIP 6104 Health and Disease (3)
HCIP 6108 Decision Analysis in Healthcare (3)
HCIP 6134 Quality and Outcomes Management in Healthcare (3)
HCIP 6146 Information Resources Management (3)
HCIP 6150 Health Law and Ethics (3)
HCIP 6380 Introduction to Health Informatics (3)

Students must complete an internship after the completion of all required coursework from one of the following courses:

HCIP 6198 IT Internship Project (3)
HCIP 6400 Internship (3)

Transfer credits cannot be applied to this certificate program.

COURSES IN HEALTH INFORMATICS (HCIP)

HCIP 5160. Applied Databases. (3) Cross-listed as ITIS 5160. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and full graduate standing required.. Identification of business database needs; requirements specification; relational database model; SQL; E-R modeling; database design, implementation, and verification; distributed databases; databases replication; object-oriented databases; data warehouses; OLAP; data mining; security of databases; vendor selection; DBMS product comparison; database project management; tools for database development, integration, and transaction control. *(Fall) (Evenings)*

HCIP 5166. Network-Based Application Development. (3) Cross-listed as ITIS 5166. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and full graduate standing. Examines the issues related to network based application development. Topics include: introduction to computer networks, web technologies and standards, network based programming methodologies, languages, tools, and standards *(Spring) (Evenings)*

HCIP 5220. Vulnerability Assessment and System Assurance. (3) Cross-listed as ITIS 5220. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Discusses methodologies, tools, and technologies that are important for vulnerability assessment and systems assurance. Topics include: ethical hacking techniques, vulnerability assessment, risk assessment/management, finding new exploits, discovering vulnerabilities, penetrating network perimeters, bypassing auditing systems, and assured administration of systems, as well as evaluating systems assurance levels. Focus will be placed on: 1) understanding current penetration techniques for networks, operating systems, services and applications; 2) investigating mitigation and defense strategies; and 3) studying legal and ethical considerations. Based on case studies with a strong lab component. *(On demand)*

HCIP 5250. Computer Forensics. (3) Cross-listed as ITIS 5250. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. The identification, extraction, documentation, interpretation, and preservation of computer media for evidentiary purposes and/or root cause analysis. Topics include: techniques for discovering digital evidence; responding to electronic incidents; tracking communications through networks; understanding electronic media, crypto-literacy, data hiding, hostile code, and Windows™ and UNIX™ system forensics; and the role of forensics in the digital environment. *(On demand)*

HCIP 5370. Health Vocabularies and Classification Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Development of fundamental medical terminology, consisting of basic word structure (including word analysis, combining forms, suffixes, prefixes, and pronunciation) of descriptive medical terms pertaining to the body as a whole and to each body system. Clinical vocabularies, terminologies and coding systems, along with definitions are described in the context of caring and treating patients. Terms covered include: diseases, diagnoses, findings, operations, treatments, drugs, and administrative items as utilized to support recording and reporting a patient's care at varying levels of detail via an electronic medical record. Identifying appropriate representation elements, uses, and sources in order to apply them in the context of health information systems and communication. *(Fall) (Evenings)*

HCIP 5375. Computer Vocabularies and Programming Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Study of the terminology and concepts used in Information Technology, Computer Science, and Information Systems. Topics include: computers and their components, system and application

software, programming paradigms, databases and data warehouses, networks, Internet, Web, security, personal digital assistants, communications, data formats and media, data representations, computer games, and technology. Explores technological constraints introduced by the intricacies of varying application domains. *(Fall) (Evenings)*

HCIP 5376. Introduction to Programming for Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Foundational use of object-oriented programming and scripting techniques to solve common problems in health informatics. Topics include: data structures for electronic health records; developing basic electronic health record applications; relational database connectivity; and interfacing with industry standard health information systems. *(Spring) (Evenings)*

HCIP 6070. Current Issues in Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Current topics and issues related to Health Informatics, including health policy analysis and development, ethical issues, structure of health administrative and delivery systems, assessment of population health, models of healthcare delivery, access and quality of care issues. *(On demand)*

HCIP 6100. Introduction to the U.S. Healthcare System. (3) Cross-listed as HADM 6100. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Overview of healthcare delivery in the United States, including organizational structures, financing mechanisms and delivery systems, with particular attention to program formation. *(Fall or Spring) (Evenings)*

HCIP 6104. Health and Disease. (3) Cross-listed as HADM 6104. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Principles and methods of epidemiology, including definitions and models of health, illness, and disease; modes of transmission of clinically important infectious agents; risk factors and chronic diseases; and insights into existing studies and paradigms of health promotion and disease prevention. *(Fall or Spring) (Evenings)*

HCIP 6108. Decision Analysis in Healthcare. (3) Cross-listed as HADM 6108. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Study of selected quantitative management tools useful in the analysis of managerial decisions, a review of basic descriptive and inferential statistics, applied probability distributions, forecasting methods, statistical process control, queuing, transportation and assignment modeling, and linear programming. Emphasis on applying quantitative decision making methods to the operational problems facing healthcare organizations. Familiarity with computers and computer software will be important for success in this course. *(Fall or Spring) (Evenings)*

HCIP 6112. Software System Design and Implementation. (3) Cross-listed as ITCS 6112 and ITIS 6112. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduction to the techniques involved in the planning and implementation of large software systems. Emphasis on applying quantitative decision making methods to the operational problems facing healthcare organizations. Familiarity with computers and computer software will be important for success in this course. *(Fall or Spring) (Evenings)*

HCIP 6134. Quality and Outcomes Management in Healthcare. (3) Cross-listed as HADM 6134. Prerequisite: HCIP 5370, HCIP 6100, and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Examination of the concepts and practices of quality management, performance improvement, and assessment of outcomes in healthcare delivery settings. Designed to provide an in-depth understanding of basic concepts and frameworks and of their applicability and relevance in specific situations. Topics include: process reengineering, service improvement, continuous quality improvement, accreditation standards, patient satisfaction, outcome measurement, teamwork, and case management. *(Fall or Spring) (Evenings)*

HCIP 6146. Information Resources Management. (3) Cross-listed as HADM 6146. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. A study of the use of information management to improve the delivery of healthcare. Information resource management includes methods and practices to acquire, disseminate, store, interpret and use information to provide healthcare in a more efficient, effective and economical manner. Emphasis is placed upon information as central to the ongoing operations and strategic decisions of healthcare organizations. *(Fall or Spring) (Evenings)*

HCIP 6150. Health Law and Ethics. (3) Cross-listed as HADM 6150. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Analysis of ethical and bioethical problems confronting healthcare delivery systems. Selected legal principles and their application to the healthcare field, including corporate liability, malpractice, informed consent and governmental regulation of health personnel and health facilities. *(Fall or Spring) (Evenings or Weekends)*

HCIP 6160. Database Systems for Health Informatics. (3) Cross-listed as ITCS 6160. Prerequisite: ITCS 6114 and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduction to principles of database design, and survey of alternative database organizations and structures. Logical database organization; schemas; subschemas; data description languages; hierarchical, network, and relational databases; database management systems; normal forms. *(Fall, Spring) (Evenings)*

HCIP 6162. Knowledge Discovery in Databases. (3) Cross-listed as ITCS 6162 and ITIS 6162. Prerequisite: ITCS 6160 and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. The entire knowledge discovery process is covered in this course. Topics include: setting up a problem, data preprocessing and warehousing, data mining in search for knowledge, knowledge evaluation, visualization and application in decision making. A broad range of systems, such as OLAP, LERS, DatalogicR+, C4.5, AQ15, Forty-Niner, CN2, QRAS, and discretization algorithms are covered. *(Fall) (Evenings)*

HCIP 6163. Data Warehousing. (3) Cross-listed as ITCS 6163 and ITIS 6163. Prerequisite: ITCS 6160 or equivalent and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Topics include: use of data in discovery of knowledge and decision making; the limitations of relational databases and SQL queries; the warehouse data models: multidimensional, star, snowflake; architecture of a data warehouse and the process of warehouse construction; data consolidation from various sources; optimization; techniques for data transformation and knowledge extraction; relations with enterprise modeling. *(Spring) (Evenings)*

HCIP 6167. Network Security. (3) Cross-listed as ITIS 6167. Prerequisite: ITIS 6200 or equivalent and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Examines the issues related to network security. Topics include: network security background and motivation, network centric threats, network authentication and identification, network security protocols, firewall, IDS, security in wireless environments, email security, instant message security, network application security, and network based storage security. There are heavy lab based components in this course. *(Fall) (Evenings)*

HCIP 6198. IT Internship Project. (3) Cross-listed as ITIS 6198. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Complete a team-based project that is originated from an IT organization and approved by the department. *(Fall, Spring, Summer)*

HCIP 6199. Principles of Computer Networks and Databases. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Computer concepts (hardware components, systems architectures, operating systems and languages, and software packages and tools); Communications technologies (networks—LANS, WANS, VPNs; data interchange standards—NIST, HL-7); Internet technologies (Intranet, web-based systems, standards – SGML, XML); Data, information and file structures (data administration, data definitions, data dictionary, data modeling, data structures, data warehousing, database management systems); Data storage and retrieval (storage media, query tools/applications, data mining, report design, search engines); Data security (protection methods—physical, technical, managerial, risk assessment, audit and control program, contingency planning, data recovery, Internet, web-based, and eHealth security). *(On demand)*

HCIP 6201. Computer Security, Privacy, and Legal Issues. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Topics include: security concepts and mechanisms; security technologies; authentication mechanisms; mandatory and discretionary controls; basic cryptography and its applications; database security, intrusion detection and prevention; assurance requirement, assurance class, evaluation methods and assurance maintenance; anonymity and privacy issues for information systems. Students gain hands-on experience through lab exercises and case studies. *(Fall)*

HCIP 6210. Access Control and Security Architecture. (3) Cross-listed as ITIS 6210. Prerequisite: ITIS 6200 and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Discusses objectives, formal models, and mechanisms for access control; and access control on commercial off-the-shelf (COTS) systems. Examines the issues related to security architectures and technologies for authorization. Topics include: cryptographic infrastructure, distributed systems security architectures, database systems security architectures, Internet security architectures, network security architectures, and e-commerce security architectures. *(Spring) (Evenings)*

HCIP 6228. Medical Informatics. (3) Cross-listed as ITCS 6228. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and graduate standing. Focuses on methods and techniques used in storage, communication, processing, analysis, integration, management, and distribution of medical information. Emphasizes the applications of telemedicine and intelligent computer-aided decision making systems in different medical and surgical systems. Discusses the computational methods to accept or reject a new drug or a new treatment for a given disease. *(On demand)*

HCIP 6230. Information Infrastructure Protection. (3) Cross-listed as ITIS 6230. Prerequisite: ITIS 6200 and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Discusses methodologies, tools, and technologies that are important for protecting information systems and information infrastructures. Topics include: techniques, processes and methodologies for information security risk assessment and management, tools and technologies for critical infrastructure protection, methodologies for continuous operation, and recovery from disasters. *(On demand)*

HCIP 6240. Applied Cryptography. (3) Cross-listed as ITIS 6240. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and full graduate standing. Provides students with an understanding of modern cryptographic techniques, algorithms and protocols that are of fundamental importance to the design and implementation of security critical applications. Covers not only standard cryptographic techniques, but also exposes students to the latest advances in applied cryptography. Topics include: secret and public key ciphers, stream ciphers, one-way hashing algorithms, authentication and identification, digital signatures, key establishment and management, secret sharing and data recovery, public key infrastructures, and efficient implementation. *(On demand)*

HCIP 6260. Analytic Epidemiology. (3) Cross-listed as HLTH 6260, HSRD 8003, and PPOL 8665. Prerequisites: HLTH 6202 with a grade of B or above, and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Principles and methods of studying advanced epidemiology, with emphasis on the analytic approach. Advanced techniques in the establishment of disease causation in groups and communities. Topics include: risk assessment, environmental exposures, stratification and adjustment, and multivariate analysis in epidemiology. Emphasis also placed on quality assurance and control and communicating results of epidemiological studies in professional publications and settings. *(Spring)*

HCIP 6330. Medical Practice Management. (3) Cross-listed as HADM 6210. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. A comprehensive study of medical practice management and the issues, tools, and techniques to resolve those issues. Provides the student with an understanding of the financial and regulatory issues that influence today's medical practice with an insight into the cultural, human resource, and governance issues that make physician practices unique among healthcare organizations. *(On demand)*

HCIP 6342. Information Technology Project Management. (3) Cross-listed as ITIS 6342. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduces students to problems associated with managing information technology projects involving, particularly, integration of systems, development of client-specific solutions, and project justification. Moves beyond the classic techniques of project management and integrate communication software/systems, multi-site, multi-client facilities projects, cultural issues involved with managing interdisciplinary teams, and the effect of rapid technological obsolescence on project justification, funding and continuance. *(Spring)*

HCIP 6350. Principles of Human-Computer Interaction. (3) Cross-listed as ITIS 6400. Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and full graduate standing. Introduction to Human-Computer Interaction practice and research. Topics include: the perceptual, cognitive, and social characteristics of people, as well as methods for learning more about people and their use of computing systems. The process of interface design, methods of design, and ways to evaluate and improve a design. Also highlights a number of current and cutting-edge research topics in Human-Computer Interaction with a balance of design, sociological/psychological, and information systems elements. *(Spring)*

HCIP 6380. Introduction to Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduces the fundamental concepts and techniques in application data management for Health Informatics and in understanding reference terminologies, data mapping and conversion, and supporting data storage and formats. Topics include: internal and external policy issues governing data collection, storage, exchange, and compliance. Includes a detailed look at the Electronic Health Record and digitized Personal Health Record as used in current healthcare environments. Primarily covers AHIMA HIM competency I.A. *(Spring) (Evenings)*

HCIP 6385. Healthcare Communication and Leadership. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Principles and useful techniques for effective oral presentations, poster presentations, scientific writing. Students critique and help revise each other's presentations and learn how to enhance communications. Students learn how to properly organize and run a meeting. Also covers negotiation, conflict management, and influence. Students use several approaches evaluate their individual leadership style. Completes a management style assessment, and analyze leadership styles of prominent leaders in the eHealth environment, using contemporary leadership theory and principles. Primarily covers AHIMA HIM competency III.A. *(On demand)*

HCIP 6390. Advanced Programming for Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Examines advanced use of object-oriented programming and scripting techniques applied to case studies in health informatics development. Emphasizes programming techniques beyond the fundamentals, with emphasis on efficiency in speed, data structures and file size. Students learn how to optimize code and databases so that the demands of large-scale health information systems can be performed in acceptable amounts of time while minimizing hardware requirements. Topics include: algorithm optimization, optimization of database queries and development for software as a service. *(On demand)*

HCIP 6391. Architecting Health Information Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduces planning, implementation, and maintenance of Health Information Systems for organizations. Students learn about the development of hardware and software requirements for system deployment, including: cost/benefit analysis, assessment of work-flow, interface, human resource factors, as well as capability assessment of regulatory requirements. Topics include: policy and procedure development for capability evaluation, regulatory compliance, system use, and data exchange. *(On demand)*

HCIP 6392. Enterprise Health Information Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Practical case studies in the use of large scale Health Information Systems. Survey of industry standard software tools and best practices. Laboratory experience in management and analytics for Electronic Health Records and enterprise data. Evaluation and selection of clinical, administrative, and specialty information technology applications for health organization. *(On demand)*

HCIP 6393. Advanced Health Data Integration. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Secondary data sources (registries and indexes; databases – such as MEDPAR, NPDB, HCUP); Healthcare data sets (such as OASIS, HEDIS, DEEDS, UHDDS, UACDS, NEDSS, NMMFS); National Healthcare Information Infrastructure (NHII); Standards and regulations for documentation (such as JCAHO, CARF, COP, AAAHC, AOA); Health information standards (such as HIPAA, ANSI, ASTM, LOINC, UMLS, MESH, Arden Syntax, HL-7); Healthcare taxonomies, clinical vocabularies, terminologies/nomenclatures (such as ICD-9-CM, ICD-10, CPT, SNOMED-CT, DSM-IV); Severity of illness systems ; Vital statistics ; Epidemiology ; Reimbursement Methodologies; Clinical data and reimbursement management; Compliance strategies and reporting (e.g. National Correct Coding Initiative); Charge-master management; Casemix management; Audit process such as compliance and reimbursement; Payment systems (such as PPS, DRGs, APCs, RBRVS, RUGs); Commercial, managed care, and federal insurance plans. *(On demand)*

HCIP 6400. Health Informatics Internship. (3) Cross-listed as HADM 6400. Prerequisites: HADM 6100; enrollment limited to students already holding or concurrently pursuing a MHA degree; instructor permission required. Offers administrative experience in a healthcare setting for students. The initial assumption is made that students participating in the internship experience have had limited hands-on exposure to healthcare administration. *Graded on a Pass/Unsatisfactory basis. (Fall, Spring, Summer)*

HCIP 6410. Personalization and Recommender Systems. (3) Cross-listed as ITIS 6410 and ITIS 8410. Prerequisites: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT and full graduate standing. An introduction to the application of personalization and recommender systems techniques in information systems. Topics include: historical, individual and commercial perspectives; underlying approaches to content-based and collaborative recommendation techniques for building user models; acceptance issues; and case-studies drawn from research prototypes and commercially deployed systems. *(On demand)*

HCIP 6490. Industrial Internship. (0-6) Cross-listed as ITCS 6490. Prerequisites: Completion of six hours of graduate coursework and enrollment in the PSM in Health Informatics or Graduate Certificate in HIT; full or part-time academic year internship in computer science areas complementary to the concentration area of studies and designed to allow theoretical and course-based practical learning to be applied in a supervised industrial experience. The supervising faculty, the academic advisor, and the graduate program director must approve each student's internship program. A mid-term report and a final report to be evaluated by the supervising faculty are required. *Graded on a Pass/Unsatisfactory basis* by the supervising faculty in consultation with off-campus supervisor at the internship organization. The credit hours may not be part of the minimum 30 credit hours for graduation. May be repeated for credit hours, but no more than six hours may be applied toward PSM degree requirements. *(On demand)*

Other Computer Science Courses (ITCS)

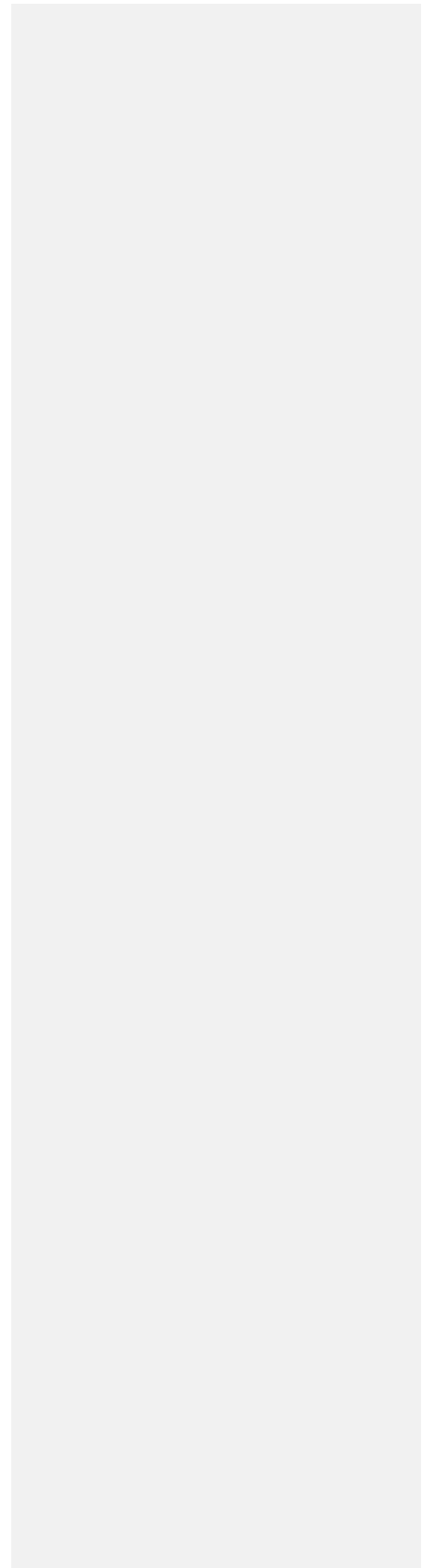
See descriptions of ITCS courses under "Computer Science" in the College of Computing and Informatics section of this *Catalog*.

Other Health Administration Courses (HADM)

See descriptions of HADM courses under “Health Administration” in the College of Health and Human Services section of this *Catalog*.

Other Information Technology Courses (ITIS)

See descriptions of ITIS courses under “Information Technology” in the College of Computing and Informatics section of this *Catalog*.



Course Number and Title

HCIP 5370 Health Vocabularies and Classification Systems

Course Description (Catalog Description)

HCIP 5370. Health Vocabularies and Classification Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Development of fundamental medical terminology, consisting of basic word structure (including word analysis, combining forms, suffixes, prefixes, and pronunciation) of descriptive medical terms pertaining to the body as a whole and to each body system. Clinical vocabularies, terminologies and coding systems, along with definitions are described in the context of caring and treating patients. Terms covered include: diseases, diagnoses, findings, operations, treatments, drugs, and administrative items as utilized to support recording and reporting a patient's care at varying levels of detail via an electronic medical record. Identifying appropriate representation elements, uses, and sources in order to apply them in the context of health information systems and communication. (Fall) (Evenings)

Pre- or Co-requisites

Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT.

Objectives of the Course

Development of fundamental medical terminology, consisting of basic word structure (including word analysis, combining forms, suffixes, prefixes, and pronunciation) of descriptive medical terms pertaining to the body as a whole and to each body system. Clinical vocabularies, terminologies and coding systems, along with definitions are described in the context of caring and treating patients. Terms covered include: diseases, diagnoses, findings, operations, treatments, drugs, and administrative items as utilized to support recording and reporting a patient's care at varying levels of detail via an electronic medical record. Identifying appropriate representation elements, uses, and sources in order to apply them in the context of health information systems and communication.

Instructional Method

This is a lecture course, structured to allow classroom, online, or mixed delivery for a given section. Each week there will be a voice-over power point presentation posted as links on the Moodle site. These presentations will be available to view at any time. To be successful in the course it is suggested you keep up with the course schedule (see below), viewing the power point presentations each week and completing the assignments so you do not get behind. It is also recommended to increase likelihood of success you read the required material for each week before you listen to the voice-over power point. For each chapter in addition to the readings, there are learning activities. It is highly suggested you complete all learning activities for the respective chapter. In addition there will be a Centra session of 1

hour from 7 – 8 pm. The Centra session allows for us all as a class to be online together. During this time I can clarify any concepts, and answer and questions or concerns you have. The Centra sessions are not required but are recommended to improve the course experience, and in case you have to miss they are recorded for your review on Moodle.

Means of Student Evaluation

Exam #1 – 100 points

Exam #2 – 100 points

Exam #3 – 100 points

Final Exam – 100 points

Total points possible: 400 points

Grade Scale:

A = 90-100%

B = 80 - 90%

C = 70 - 80%

U = below 70%

P/F = Pass above 70%

Policies That Apply to this Course

Code of Student Responsibility:

“The UNC Charlotte Code of Student Responsibility (the Code) sets forth certain rights and responsibilities in matters of student discipline. The Code defines these responsibilities and guarantees you certain rights that ensure your protection from unjust imposition of disciplinary penalties. You should familiarize yourself with the provisions and procedures of the Code” (Introductory statement from the UNC Charlotte brochure about the Code of Student Responsibility). The entire document may be found at this Internet address: <http://legal.uncc.edu/policies/up-406>

Academic Integrity:

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code of Student Academic Integrity, including plagiarism, will result in disciplinary action as provided in the Code. Students are expected to submit their own work, either as individuals or contributors to a group assignment. Definitions and examples of plagiarism and other violations are set forth in the Code. The Code is available from the Dean of Students Office or online at: <http://legal.uncc.edu/policies/up-407>

Course Credit Workload:

This 3 credit course requires 3 hours of classroom or direct faculty instruction and 5 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: Required reading, written assignments, and studying for exams.

Special Needs:

If you have a documented disability and require accommodation in this course, contact Disability Services, Fretwell 230, phone: 687 4355 voice/TDD) the first week of the semester. Information about available services may be found at <http://legal.uncc.edu/policies/up-501>. Accommodations for learning will be arranged by that office and communicated to the Instructor. If you speak English as a second language, please inform the instructor.

Diversity Statement:

UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

All students are required to abide by the UNC Charlotte Sexual Harassment Policy (<http://legal.uncc.edu/policies/up-502>) and the policy on Responsible Use of University Computing and Electronic Communication Resources (<http://legal.uncc.edu/policies/up-307>). Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards.

Religious Accommodation:

It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to their instructor prior to the census date for enrollment for a given semester <http://legal.uncc.edu/policies/up-409>. The census date for each semester (typically the tenth day of instruction) can be found in UNC Charlotte's Academic Calendar (<http://registrar.uncc.edu/calendars/calendar.htm>).

Textbooks or Resources

Gyls B, Wedding ME. *Medical Terminology Systems: A Body Systems Approach*. Philadelphia, Pa: F.A. Davis, 6th edition, 2009.

Topical Outline of Course Content

Week	Topic	Chapter
1	Basic elements of medical word suffixes	1-2
2	Prefixes	3
3	Body Structure	4
4	Exam #1	
5	Integumentary System	5
6	Digestive System	6
7	Respiratory System	7
8	Cardiovascular System	8
9	Blood, lymph, immune System	9

10	Exam # 2	
11	Musculoskeletal System, Nervous System	10,14
12	Genitourinary System, Female Reproductive System	11-12
13	Endocrine System	13
14	Exam #3	
15	Special Senses	15
16	Review	

Course Number and Title

HCIP 5375 Computer Vocabulary and Programming Systems

Course Description (Catalog Description)

HCIP 5375. Computer Vocabularies and Programming Systems. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Study of the terminology and concepts used in Information Technology, Computer Science, and Information Systems. Topics include: computers and their components, system and application software, programming paradigms, databases and data warehouses, networks, Internet, Web, security, personal digital assistants, communications, data formats and media, data representations, computer games, and technology. Explores technological constraints introduced by the intricacies of varying application domains. (Fall) (Evenings)

Pre- or Co-requisites

Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT.

Objectives of the Course

This course provides graduate students with a comprehensive overview of terminology and concepts in information technology. Students will become familiar with major concepts and terminologies in computer science and information systems, in order to appreciate and apply selected key concepts in information technology especially in the context of healthcare applications. Students will gain basis experience with selected key concepts in programming paradigms and systems. At the conclusion of this course, the student should be able to demonstrate foundational knowledge of: (1) Information Technology principles, history, and fundamental components; (2) hardware, including system units, input/output devices, storage concepts, and communications/networking; (3) system software, including operating systems and input/output systems, programming languages, database management systems, networking and Internet protocols, cloud computing, and computer security/privacy concepts; (4) application software, including use and design of software applications, databases/data warehouses, business intelligence systems, mobile applications, and social media applications.

Instructional Method

This is a classroom-based lecture course. Students will be introduced to material through lectures and demonstrations and gain a deeper knowledge through application of principles and techniques in homework assignments and a course project.

Means of Student Evaluation

Quizzes (30%)	Weekly quizzes on the concepts studied in the previous week
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Final Exam (20%)	The final exam will ask you to put together all of the important concepts you have learned and developed throughout the course.
Project (20%)	The project will give you the opportunity to explore one or more concepts in more depth and apply these concepts in a small real life application
Homework (30%)	You will have homework assignments due for almost every class period. These assignments will be graded on a three point system (0 - no or insufficient quality or effort; 1 - average quality; 2 - high quality). The lowest two homework grades will be dropped, and the rest of the grades will be averaged.

A = 90% or above
 B = 80% or above
 C = 70% or above
 U = below 70%

Policies That Apply to this Course

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Course Credit Workload:

This 3 credit course requires 3 hours of classroom or direct faculty instruction and 5 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: Required reading, written assignments, and studying for exams.

Special Needs:

If you have a documented disability and require accommodation in this course, contact Disability Services, Fretwell 230, phone: 687 4355 voice/TDD) the first week of the semester. Information about available services may be found at

<http://legal.uncc.edu/policies/up-501>. Accommodations for learning will be arranged by that office and communicated to the Instructor. If you speak English as a second language, please inform the instructor.

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Religious Accommodation:

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Textbooks or Resources

Introduction to Computers for Healthcare Professionals, Fifth Edition, by Irene Joos, Romona Nelson, and Marjorie J. Smith

Topical Outline of Course Content

Week	Topic	Chapter
1	Introduction, Binary Representations	1
2	Software, Hardware, CPU, Memory, Storage	2
3	Operating Systems, Machine Code	3
4	Software Applications, File Systems	4
5	Office Applications, Data Structures, Graphics	5
6	XML Representation	6
7	Spreadsheets, Scripting, Macros	7
8	Database Design, Relations	8
9	Database Systems	
10	World Wide Web, HTML, Web Programming	9, 10
11	Privacy, Confidentiality, Security, Integrity	12, 13
12	Healthcare Informatics	14
13	Programming Paradigms, High Level Programming	

14	Programming Issues and Applications	
15	Project Presentations	
16	Review	

Course Number and Title

HCIP 5376 Introduction to Programming for Health Informatics

Course Description (Catalog Description)

HCIP 5376. Introduction to Programming for Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Foundational use of object-oriented programming and scripting techniques to solve common problems in health informatics. Topics include: data structures for electronic health records; developing basic electronic health record applications; relational database connectivity; and interfacing with industry standard health information systems. (Spring) (Evenings)

Pre- or Co-requisites

Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT.

Objectives of the Course

This course provides provide graduate students with a comprehensive overview of information technology systems and applications commonly found in healthcare organizations, as well as foundational use of programming and scripting techniques. At the conclusion of this course, the student should be able to: (1) identify supporting Information Technology hardware/software components and principles of networking elements; (2) understand, use, and design administrative/clinical/decision-support medical applications; (3) understand and apply programming and design techniques for scripting, procedural/object-oriented programming, databases, and web applications.

Instructional Method

This is a classroom-based lecture course. Students will be introduced to material through lectures and demonstrations and gain a deeper knowledge through application of principles and techniques in homework assignments and a course project.

Means of Student Evaluation

Quizzes (20%)	Weekly quizzes on the concepts studied in the previous week
Projects (40%)	The projects will give you the opportunity to explore one or more concepts in more depth and apply these concepts in small real life applications
Homeworks (40%)	You will have homework assignments due for almost every class period. The lowest two homework grades will be dropped, and the rest of the grades will be averaged.

A = 90% or above

B = 80% or above

C = 70% or above

U = below 70%

Policies That Apply to this Course

Code of Student Responsibility:

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Academic Integrity:

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Course Credit Workload:

This 3 credit course requires 3 hours of classroom or direct faculty instruction and 5 hours of out-of-class student work each week for approximately 15 weeks. Out-of-class work may include but is not limited to: Required reading, written assignments, and studying for exams.

Special Needs:

If you have a documented disability and require accommodation in this course, contact Disability Services, Fretwell 230, phone: 687 4355 voice/TDD) the first week of the semester. Information about available services may be found at <http://legal.uncc.edu/policies/up-501>. Accommodations for learning will be arranged by that office and communicated to the Instructor. If you speak English as a second language, please inform the instructor.

Diversity Statement:

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All students are required to abide by the UNC Charlotte Sexual Harassment Policy (<http://legal.uncc.edu/policies/up-502>) and the policy on Responsible Use of University Computing and Electronic Communication Resources (<http://legal.uncc.edu/policies/up->

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Religious Accommodation:

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Textbooks or Resources

Practical Programming: An Introduction to Computer Science Using Python by Jennifer Campbell, Paul Gries, Jason Montojo, Greg Wilson

Topical Outline of Course Content

Week	Topic	Chapter
1	Introduction, Programming Overview	1
2	Python as a Programming Language	2
3	Strings	3
4	Modules	4
5	Lists	5
6	Conditional Control Structures	6
7	Looping Control Structures	7
8	File Processing	8
9	Sets and Dictionaries	9
10	Algorithms	10
11	Searching and Sorting	11
12	Testing and Debugging	12
13	Object-Oriented Programming	13
14	Graphical User Interfaces	14
15	Database Integration	15
16	Review	

Course Number and Title

HCIP 6380 Introduction to Health Informatics

Course Description (Catalog Description)

HCIP 6380. Introduction to Health Informatics. (3) Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT. Introduces the fundamental concepts and techniques in application data management for Health Informatics and in understanding reference terminologies, data mapping and conversion, and supporting data storage and formats. Topics include: internal and external policy issues governing data collection, storage, exchange, and compliance. Includes a detailed look at the Electronic Health Record and digitized Personal Health Record as used in current healthcare environments. Primarily covers AHIMA HIM competency I.A. (Spring) (Evenings)

Pre- or Co-requisites

Prerequisite: Enrollment in the PSM in Health Informatics or Graduate Certificate in HIT.

Objectives of the Course

This course introduces the fundamental concepts of health informatics with an emphasis in four primary areas: Health Information Systems, Health Data, and Electronic Health Records; Health Information Privacy, Security and Ethics; Exchanging Health Data; and Health Information Applications and Quality Improvement. Across these areas, at the conclusion of this course, the student should be able to:

- Health Information Systems, health data, and Electronic Health Records – Identify the goals and barriers to widespread health information technology (HIT) adoption; Compare and contrast standards used for electronic health records and Meaningful Use; Identify the benefits and disadvantages of electronic health records, and the obstacles to implementing them; Identify the features of an integrated practice management system
- Exchanging Health Data – Understand the concept of health information organizations (HIOs), and how they integrate with the Nationwide Health Information Network (NHIN); Identify the need for and benefits of health information exchanges (HIEs) and interoperability; Explain the use of information technology in the field of public health and specifically the significance of syndromic surveillance for early detection of bioterrorism, emerging diseases, and other health events
- Health Information Privacy, Security and Ethics – Describe privacy and security measures that are part of HIPAA, HITECT Act, and Meaningful Use and how they fit into the Nationwide Health Information Network; Recognize the importance of data security and privacy as related to public perception, particularly in regards to data breach and loss; Describe security standards and the laws intended to protect health data, and identify different types of security breaches and their causes;

Describe the complexities in the relationship between ethics, law, culture and society

- Health Information Applications and Quality Improvement – Define the evidence pyramid and understand the benefits and limitations of evidence based medicine; Describe the role of disease management in chronic disease and the interrelationships between disease registries, evidence based medicine and quality improvement programs; List the components of the Quality Improvement Roadmap and National Quality Strategy; Understand how health information technology (HIT) can support quality improvement as well as how information technology can potentially improve or worsen patient safety; Explain the benefits and obstacles of electronic prescribing; Recognize the importance of bioinformatics in future medical treatments and prevention; Understand the benefits of digital radiology to clinicians, patients and hospitals, and the challenges facing the adoption of picture archiving and communications systems.

Instructional Method

This is a classroom-based lecture course. Students will be introduced to material through lectures and demonstrations and gain a deeper knowledge through application of principles and techniques in homework assignments and a course project.

Means of Student Evaluation

Quizzes (30%)	Weekly quizzes on the concepts studied in the previous week
Final Exam (20%)	The final exam will ask you to put together all of the important concepts you have learned and developed throughout the course.
Project (20%)	The project will give you the opportunity to explore one or more concepts in more depth
Homework (30%)	You will have homework assignments due for almost every class period. These assignments will be graded on a three point system (0 – no or insufficient quality or effort; 1 – average quality; 2 – high quality). The lowest two homework grades will be dropped, and the rest of the grades will be averaged.

A = 90% or above

B = 80% or above

C = 70% or above

U = below 70%

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Textbooks or Resources

Health Informatics: Practical Guide for Healthcare and Information Technology Professionals (Fifth edition, 2012), Hoyt, R. E. (ed)

Topical Outline of Course Content

Week	Topic	Reading Assmt
1	Overview of Health Informatics	Pp 1-30
2	Healthcare Data and Data Standards	Pp 37-54, 141-151
3	Electronic Health Records	Pp 59-88
4	Architectures of Systems and Practice Management Systems	Pp 103-111, 155-167
5	Health Information Exchanges	Pp 115-137
6	Health Information Privacy Security and Ethics	Pp 169-212
7	Consumer Health Informatics and Mobile Technology	Pp 217-251
8	Online Medical Resources and Search Engines	Pp 255 - 287
9	Evidence Based Medicine and Clinical Practice Guidelines	Pp 289-310
10	Disease Management and Disease Registries	Pp 315-328
11	Quality Improvement Strategies and Electronic Research	Pp 331-339, 449 - 457
12	Patient Safety and HIT	Pp 343 - 359
13	Electronic Prescribing and Telemedicine	Pp 367-392
14	Public Health Informatics	Pp 425-442
15	Bioinformatics and Picture Archiving and Communications Systems	Pp 397-420
16	Review	