HOUSTON COMMUNITY COLLEGE SYSTEM
HEALTH INFORMATION TECHNOLOGY PROGRAM
COMPUTERS IN HEALTH CARE – HITT 1311
SPRING 2011

INSTRUCTOR
Dr. Fanny C. Hawkins, RHIA   office hours: appointment only
Phone: 713-410-0108

COURSE DESCRIPTION
Introduction to the concepts of computer technology related to
health care and the tools and techniques for collecting, storing,
and retrieving health care data.

PREREQUISITES
POFI 1301 or ITSC 1309

CREDIT
3 semester hours

Notice: Students who repeat a course for a third or more times may
soon face significant tuition/fee increases at HCC and other Texas
public colleges and universities. Please ask your
instructor/counselor about opportunities for tutoring/other
assistance prior to considering course withdrawal or if you are not
receiving passing grades.

TEXTBOOK/REFERENCE
Health Information Management Technology (blue) - M. Johns
Health Information: Management of a Strategic Resource – Abdelhak
Information Management for Health Professions (green) – M. Johns
Comprehensive Review Guide for Health Information: RHIA & RHIT Exam
Prep
Handouts from Instructor
Blackboard at http://hccs.blackboard.com

Blackboard

Your Blackboard login user ID will be your HCC User ID (sometimes
referred to as the "W" number). All HCC students have a unique
User ID. If you do not know your User ID you can look it up by
visiting the HCC home page:

o From www.hccs.edu, click on "Login Help" under the "Student System Sign In" field
o Then click on "Retrieve User ID" and follow the instructions.

Or use the direct link:
https://hccsaweb.hccs.edu:8080/servlets/iclientservlet/sauat/?cmd=start

The default student password is "distance." Students will then be prompted to change their password after their first login. Please visit DE Technical Support FAQs if you need additional assistance with your log in.

COURSE GOALS (reference AHIMA entry level competencies)

IVa1 Use common software packages (eg. Spreadsheets, databases, word processing, graphics, presentation, statistical, e-mail).

IVa2 Use electronic imaging technology to store medical records.

IVa3 Query facility wide databases to retrieve information.

IVa4 Generate reports from various databases.

IVa5 Protect data integrity and validity using software or hardware technology.

IVa6 Identify common software problems.

IVb3 Maintain integrity of master patient / client index.

IVb5 Design forms, computer input screens, and other health record documentation tools.

COURSE OBJECTIVES AND *SCANS COMPETENCIES
(*U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills)

1. Define and describe the overall scope of health information systems.
    (SCANS: F1 Reading, F2 Writing)
2. Explain the fundamental concepts of database models.
    (SCANS: F1 Reading, F2 Writing, C19 Applies technology to a task)
3. Understand the functionality of structured query language.
    (SCANS: C18 Selects technology)
4. Illustrate some examples of how an ADT is used in a health information system.
    (SCANS: F7 Creative thinking, F12 Reasoning)
5. Build an electronic health record system.
    (SCANS: F7 Creative thinking, F9 Problem solving, C17 Improves and designs systems)
6. Discuss similarities and unique characteristics among the various life cycles, including the general systems life cycle, information systems life cycle, and information systems development life cycle.
    (SCANS: F6 Speaking, C15 Understands systems)

EQUAL EDUCATIONAL & EMPLOYMENT OPPORTUNITY

HCCS seeks to provide equal education opportunities without regard to race, color, religion, national origin, sex, age or handicap.

ATTENDANCE POLICY

Students taking Internet courses complete weekly assignments at their own computers and communicate with their instructor by electronic mail and other provided web-based technologies. Students complete assignments, take tests, and complete all other coursework just as they would in an on-campus class. Instructor will have weekly on-line chats with students. Course work will be submitted via the internet. Students must be in attendance on campus for appointed times and major exams.

GRADING POLICY

Class project	10%
Tests (including Midterm)	40%
Individual assignments	10%
Final Exam	40%

3 points added to overall grade for attending HAHIMA meeting

Academic Dishonesty will not be tolerated. Exams and assignments are individual assignments. Plagiarized and copied papers will be handled in accordance with established HCCS college policy. Do not copy work of others.

GRADING SCALE

90 – 100	A
80 – 89	B
75 – 79	C
74 and below	F (No Ds will be given)

Students who do not sit for a major examination will have **NO MAKE-UP EXAMINATIONS,** except upon the discretion of the instructor.

ADA STATEMENT

Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty are authorized to provide only the accommodations requested by the Disability Support Services Office. For questions, contact Donna Price at 713-718-5165 or the Disability Counselor at each college.

Also visit the ADA web site at:
http://www.hccs.edu/students/disability/index.htm. The Disability
Counselor for this college Dr. Raj Gupta. The names and phone
numbers are listed in the spring schedule.

HCC COURSE WITHDRAWAL POLICY
The State of Texas has begun to impose penalties on students who
drop courses excessively. For example, if you repeat the same
course more than twice, you have to pay extra tuition. Beginning
in Fall 2007, the Texas Legislature passed a law limiting students
to no more than **SIX** total course withdrawals **throughout** their
educational career in obtaining a certificate and/or degree.

To help students avoid having to drop/withdraw from any class, HCC
has instituted an Early Alert process by which your professor will
"alert" you and counselors that you might fail a class because of
excessive absences and/or poor academic performance. You should
visit with your professor or a counselor to learn about what, if
any, HCC interventions might be available to assist you – online
tutoring, child care, financial aid, job placement, etc. – to stay
in class and improve your academic performance.

If you plan on withdrawing from your class, you **MUST** contact a
counselor or your professor prior to withdrawing (dropping) the
class and this must be done **PRIOR** to the withdrawal deadline to
receive a "W" on your transcript. **Final withdrawal deadlines
vary each semester and/or depending on class length, please visit
the online registration calendars, HCC schedule of classes and
catalog, any HCC Registration Office, or any HCC counselor to
determine class withdrawal deadlines. *Remember to allow a 24-hour
response time when communicating via email and/or telephone with a
professor and/or counselor. Do not submit a request to discuss
withdrawal options less than a day before the deadline.* If you do
not withdraw before the deadline, you will receive the grade that
you are making in the class as your final grade.

NOTICE
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face significant tuition/fee increases at HCC and other Texas
public colleges and universities. Please ask your
instructor/counselor about opportunities for tutoring / other
assistance prior to considering course withdrawal or if you are not
receiving passing grades.

EXPANDED ONLINE TUTORING
Onsite tutor is available upon application at the Academic Success Center of Coleman Campus.

Online tutoring is offered to students in MATH, BIOL, CHEM, PHYS, ENGL, PSYC, and for papers in all subjects. Students may self-register with any e-mail address, choosing their own user names and passwords. As always, students may submit work 24 / 7/ 365 and will get responses within 24
hours -- and usually much faster than that.

For more information or for an electronic version of the registration and information flyer, contact deborah.hardwick@hccs.edu.

EARLY ALERT SYLLABUS STATEMENT
The Houston Community College Early Alert program has been established to assist in the overall effort to retain students who are at risk of failing, withdrawing, or dropping a course. This process requires instructional faculty and student support staff to identify students who are performing poorly as early as possible and provide relevant support services to help students overcome their deficiencies. A student is identified when an instructor notices academic or personal difficulties that affect student's academic performance. The possible problem (s) could be tardiness, missed/failed test scores, excessive absences, or a number of other circumstances. Once a referral is made counselors will then contact students to discuss the issues and possible solutions to their academic difficulties.

Students on campus room 436 or 1st floor Computer Lab

Mondays class does not meet, instructor will be online with GoToMeeting from 4-5pm. Chat discussion topics will be sent via Blackboard email. Tests are to be done on an individual bases and academic dishonesty will result in dismissal from program. Tests close Saturday at 10pm. Students cannot see results of tests. Instructor will share the top 10% of missed questions with students. See Blackboard for Tests/Quiz dates.

*Jan 24
Introduction to Course

Lesson 1- Introduction to Health Information Systems
Johns (blue) ch 16, 17
Johns (green) ch 1,3, & 4
Abdelhak 270-283
"What is Biomedical Informatics?" (Berstam)

Define Information Management.

What is Informatics?

Define Biomedical Informatics.

Trace the evolution of information systems in healthcare.

Identify the major types of information systems applications used in healthcare organizations.

Discuss strategic information systems planning.

Recognize the emerging trends affecting the development of healthcare information systems.

Describe the traditional role of a Health Information Management professional.

Discuss the emerging role of the Health Information Management professional.

Jan 31
Lesson 2 - Information Systems in Health Care
Johns (blue) ch 17
Johns (green) ch 2, 3
Abdelhak 270-284

Identify the three major functions of an information system.

Define the concept of a system.

Describe the characteristics of a system and relate these to an information systems example.

Distinguish between system elements of input, processing, and output and give healthcare examples of each.

Describe the contribution of and interrelationships between information system components of people, work processes, data and information technologies.

Identify the three components of information technology.
Discuss the major types of information systems and give an example of each.

Define terms in "glossary of terms" of Abdelhak chapters 8-10 and Johns (blue) chapters 16-19.

Feb 7
Lesson 3 - Design and Development of Health Information Systems
Johns (blue) ch 16, 17
Johns (green) ch 5-6
Abdelhak ch 5, 270-283

Identify the three main types of system software and provide an example of each.

Describe programming languages.

Discuss the major types of databases.

Compare the functions of systems analysis with the functions of systems design.

Discuss the stages in the traditional systems development life cycle.

Describe methodologies that can be used to quickly design and develop information systems.

Define the functions of a database management system.

State the purpose of data modeling.

Define the customary steps in the data modeling process.

Differentiate between entities, attributes, and relationships in a data model.

List and describe the contents of a conceptual data model.

Feb 14
Lesson 4 - Information Systems for Managerial and Clinical Support
Johns (blue) ch 18
Johns (green) ch 3-5
Abdelhak 243-247; 283-287
"A categorization and analysis of the criticisms of Evidence-Based Medicine" (Cohen)
"The Guideline Interchange Format" (Ohno-Machado)
Bayes Theorem
Einstein's Legacy

Discuss clinical information systems.

Describe administrative information systems.

Explain management support systems.

Differentiate among strategic, tactical and operational decision making.

Define and give examples of a management information system.

Define and give examples of a clinical decision support system.
Discuss information retrieval.

Discuss information systems in image storage and retrieval.

Define and give examples of an executive information system.

Differentiate between data and information.

Define "Evidence-Based Medicine".

How can Information Systems be used for decision support?

What are the requirements of a good decision support system?

Contrast and compare decision support systems.

What is a clinical practice guideline?

How can clinical practice guidelines be exchanged among institutions using computer-based applications?

Describe GLIF.

Define probability, sensitivity, prevalence, and specificity.

Using Bayes' Theorem, calculate the probability, sensitivity, prevalence and specificity of a disease.

After surfing the *Einstein's Legacy* website, explain the process of X-ray and CAT scan imaging.

Feb 21 Presidents Day

*Feb 28
Lesson 5 AHIMA Virtual Lab, Second Life and other Software packages
Johns (green) ch 6
"Return on Investment for a Computerized Physician Order Entry System" (Kaushal)
"Unexpected Increased Mortality After Implementation of a Commercially Sold Computerized Physician Order Entry System" (Han)
"Computerized Provider Order Entry Implementation: No Association with Increased Mortality Rates in an Intensive Care Unit" (Beccaro)

Perform tasks using various software packages (Word, Excel, Access, AHIMA Virtual Lab, Second Life) and describe their implications for Health Information Management.

Describe CPOES.

What effect does CPOES have on the quality of health care?

Mar 7
Group Project Meeting day

Mar 14 Spring Break

Mar 21 – Group Project Meeting day

Mar 28
Lesson 6 The Internet
Johns (green) ch 3
Johns (blue) ch 15
Abdelhak 156, 244, 288-292

Identify network protocols used in the Internet.

Compare and contrast local area networks, wide area networks, intranets, extranets and the Internet.

Understand how to use the Internet to conduct research on health related topics.

Describe e-commerce and e-health.

Describe the role of SSL in Internet applications.

Apr 4
Lesson 7 Electronic Health Record
Johns (blue) 117, 121, 135-136, 798-808
Johns (green) ch 3
Abdelhak chapters 5, 10
"Use of Electronic Health Records in U.S. Hospitals" (Jha)

Build a case for electronic health records as central components in integrated and networked systems.

Explain functional requirements and expectations for electronic health records.

Describe the progress towards electronic health records.

Discuss data and information concepts for health information systems and electronic health records.

Discuss the growing role of the electronic health record and review the progress in their development.

Discuss ARRA and HITECH and the effect on the HIM profession.

Discuss the adoption of EHRs in U.S. hospitals.

Apr 11
Lesson 8 Technology and Databases
Johns (blue) ch 18
Johns (green) ch 6-9
Abdelhak 190-195, ch 6, 8
"Desiderata for Controlled Medical Vocabularies in the Twenty-First
*   Century" (Cimino)*

Differentiate between files, records and fields.

Differentiate between data base models.

Describe various types of organizational databases.

Discuss data warehouses, data marts and data mining.

Describe steps for building a data mart.

Discuss data retrieval and analysis.

Describe role of data administrator.

Identify characteristics that constitute data quality.

Describe methods for ensuring data quality.

Define emerging technologies and describe their importance to health information technicians.

Identify and describe emerging information technologies used to assist with virtual teamwork, improvement in patient and clinician contact, clinical decision making and diagnostic and therapeutic services.

What effect does vocabularies, standards and terminologies have on the transmission of data?

If grade average is 74 or below, see instructor. April 21st at 4:30pm last day to drop with grade of "W". See syllabus page 3, Grading Policy for weighted averages.

Apr 18
Lesson 9 Information Systems Life Cycle
Security, Audit & Control of Health Care Data
PHR
Consumer Informatics
Johns (blue) ch 19
Johns (green) ch 9
Abdelhak ch 9
"Personal Health Records and the HIPAA Privacy Rule"

Discuss similarities and unique characteristics among the various life cycles, including the general systems life cycle, information systems life cycle, and information systems development life cycle.

Understand the impact on organizational resources of the juxtaposition of various information systems at different information systems life cycle stages.

Discuss the life cycle stages in Nolan's six stage theory of information system development.

Identify the three stages of the information systems development life cycle and the component of each.

Apply techniques and tools, including hierarchy charts, data flow diagrams, data dictionaries, and entity-relationship diagrams to perform information systems analysis and design.

Describe four primary components of the security provisions of HIPPA.

Understand role of health information technician with regards to security of data.

Understand difference between confidentiality, privacy and security.

Describe elements of data security program.

Discuss methods to minimize threats to data security.
Explain authentication tools used by information systems.

Build a case for why a firewall is needed.

How will the PHR impact health information technology?

Define Consumer Informatics.

*Apr 25
Present Class Project

*May 3
TEST 4 – Final Exam

Assignments

1. *IT Abbreviations*
    Identify the following Information Technology related abbreviations:

    1. CIO

    2. COO

    3. CQI

    4. IDN

    5. IDS

    6. GUI

    7. IS

    8. IT

    9. LAN

    10.   SQL

2. *IT Terms*
    Define the following IT Terms
    Computers
    - What is a computer?
    - Server
    - Workstation

- Personal computer

Information Systems
- IT (Information Technology)
- IS (Information Systems)
- Competitive Advantage (using IT)
- Computer-Based Information System
- Data or Information Processing
- Data Resources
- Electronic Commerce (E-Commerce)
- End User
- Globalization
- Hardware Resources
- Data vs. Information (details vs. mass trends)
- Information Products
- Information Quality
- Information System
- Information System Model
- Roles of IS in an organization
- CAD computer aided design
- CAM computer aided manufacturing
- Decision Support Systems
- Executive Support Systems
- Quality control, Benchmarking
- Competitive Forces Model
- Product Differentiation
- Focused Differentiation
- Low-Cost Leader
- Business Alliances
- Datamining
- Inventory Methods
- Just in time
- Stockless Inventory
- Computer Systems/Computer Peripherals
- User Interface
- System Software/Application Software/Procedures
- Database elements

Computer Hardware
- Types of Computers:
  - Micro or personal computer

- o Midrange (mini) computer
- o mainframe computer
- o Super computer
- Turning Mainframes to WebServers
- Printers
- Displays
- Keyboard
- Mice
- Graphical table
- Light pen
- Input/Output Technologies
- CPU
- MIPS/MHZ/Nanoseconds
- Storage
- Magnetic vs. Optical
- Bit/Byte/Kilobyte/Megabyte/Gigabyte/Terabyte
- Floppy Disks
- Hard Disk/Hard Drive
- CD-ROM
- CD-RW
- DVD-ROM
- DVD-RAM
- Voice Recognition
- OCR/Optical Character Recognition

Computer Software
- Application Software
- System Software
- Procedures
- Groupware
- User Interface
- Utility Programs
- Software Suites/Integrated Packages
- Word Processor (Word)
- Database Management (Access)
- Electronic Spreadsheet (Excel)
- Presentation Graphics (PowerPoint)
- File System
- File
- Folder
- Executable File

- Data File
- Operating System
- Windows
- Multi-tasking
- Multi-user
- Technical Job Market
- Lack of trained people
- Labor-intensive nature of software development
- Constantly Accelerating technology

Business Telecommunications
- Open Architecture (open systems) vs. Closed Architecture
- Internet
- Electronic Commerce
- American Online
- Electronic Mail
- Web Browser
- Webpage
- Homepage
- Website
- Internet Access:
  - dial-up modem
  - cable modem
  - DSL
  - URL
  - OSI stack
  - TCP/IP

Security
- Definition
- Authentication
- Authorization
- Public and private key cryptography
- Cyphers

3. *Electronic Medical Record*
   After a review of an EHR, utilizing Microsoft Access, design the following inpatient computer views (screens):
   - Admission Sheet (face sheet)
   - Intake/Output Flow Sheet
   - Problem List

4. *Database Management*
    Utilizing Microsoft Access, prepare a database of 50 medical
    records obtained from the lab. Fields to be included and
    defined in the data dictionary are the following:

last name	*date of admission	ICD-9-CM dx
first name	*date of discharge	ICD-9-CM pr
age	length of stay	gender
race	source of payment	disposition

    Generate the following reports:
    * Master patient index sorted by last name
    * ICD-9-CM diagnostic index in numerical order
    * Query of all male patients in alphabetical order
    * Query of all female patients over the age of 23 in
      alphabetical order
    * Report of average length of stay by age groups (0-10 years,
      11-20 years, 21-30 years, 31-40 years, 41-50 years,
      51-60 years, 61-70 years, 71-80 years and 81 years and
      above.
        * Make a table and graph of the average length of stay
          by age groups.

    Develop a data dictionary for the above database. Data fields
    defined must include gender, race, source of payment, and
    disposition.

    *Use the year of 2010 as the admission and discharge year.

5. *Scavenger Hunt*
    Using virtual lab, complete answers to scavenger hunt.

6. *Case Mix*
    Using case mix report and excel, develop a frequency
    distribution of the DRGs of the first 27 accounts or patients.
    Include the total reimbursement per DRG. Which DRG produced
    the most money?

7. *Productivity Summary*
    Using the first 17 employees in the productivity summary,
    determine the employee (user ID) who was the most productive
    based upon total number of encounters, total duration with
    encounters and the average duration per encounter.

8. *Calculations*
   Using problems, calculate the probability, sensitivity, prevalence, specificity and Bayes' Theorem of the stated disease.

9. *Spreadsheet*
   a. Utilizing Microsoft Excel, prepare a spreadsheet of 25 medical records obtained from the lab. Fields to be included are the following:

last name	*date of admission	gender
first name	*date of discharge	age
length of stay	average length of stay	

   Produce a report with the following information:
   - Length of stay for each patient
   - Average length of stay of all patients
   - Standard deviation of patients lengths of stays
   - Graphical representation of lengths of stays
   - Run a t-test of the lengths of stays between males and females. State whether or not there is a significant difference at the point .05 alpha level.

*Note: Use 2010 as the admission and discharge year.

   b. Utilizing Excel and based upon the following data, develop a frequency distribution for Health Information Directors to include the following:
      1. Number of years in current position, frequency, percentage and cumulative percentage.
      2. Determine the mean number of years the directors have been in their positions.
      3. Determine the standard deviation of the data.
      4. Depict finding utilizing a graph.
      5. Run a Pearson Correlation Coefficient of the data and determine if there is a significant relationship in the number of HIM directors relative to their number of years in their current positions.

# of H.I.M. Directors	# Years Current in Position
2	1
9	2
10	3
11	4
19	5
17	6
16	7
21	8
29	9
55	10
43	11
20	12
2	13
2	14
4	15
5	16
1	17

Class Project

The Hawkins Foundation is the national voluntary agency dedicated solely to the welfare of the almost 3 million people with epilepsy in the U.S. and their families. The organization works to ensure that people with seizures are able to participate in all life experiences; to improve how people with epilepsy are perceived, accepted and valued in society; and to promote research for a cure. In addition to programs conducted at the national level, people with epilepsy throughout the United States are served by more than 50 Epilepsy Foundation affiliates around the country.

The Hawkins Foundation has all of their patients' health information stored in a paper base format.

Assist **The Hawkins Foundation** with transforming the health information department into an electronic department.

(**Group 1**)
1. Using Access, design an MPI.

(**Group 2**)
1. Using Excel, design a billing tickler system.

(**Group 3**)
1. Shop EHR vendors.
2. Because you are not able to find a vendor that meets the needs for the foundation, develop views for admission and registration.

TEAM   MEMBER EVALUATION

Evaluation of: _____

Evaluated by: _____

Team Members: _____, _____, _____

Project: _____

Evaluate each team member rated on the aspects of his/her team participation on a letter grade scale, where: poor = 1 (F), fair = 2 (C), good = 3 (B), and excellent = 4 (A)

Points:
26-32 =A,
16-25=B
15-20=C
8-14=F

Team Member's Actions	4 (A)	3 (B)	2 (C)	1 (F)
Attends planned meetings				
Prepares his/her section of presentations carefully				
Supports others and provides helpful suggestions/feedback				
Accepts the ideas of others				
Listens carefully to others				
Acts as a positive example to other members				
Accepts responsibility for assigned class products				
Overall rating of participation and contribution				
TOTAL POINTS				

Other comments: _____--_____

_____