Courses and Descriptions

COHE 6430 Database Systems in Health Care

Description: Electronic Health Record (EHR) systems have become a seemingly ubiquitous component of modern health care. They are instrumental in the treatment of patients, hospital administration, and research. At the heart of an EHR is the database management system. It is vital for health care managers to have a working knowledge of databases to adequately manage personnel and projects, evaluate future scenarios and products, and comply with organizational, state, and federal regulations.

In COHE 6430, we examine the use of database systems in health care. Topics range from a historical recounting of medical databases to the current state of clinical data warehousing. Students will become familiar with basic concepts and terminology, techniques for analyzing requirements and constructing systems, legal and security issues inherent in health care, querying databases, basic system optimization, and maintaining a safe and valid environment to name a few. Although many flavors of databases exist (e.g., hierarchical, network, entity-attribute-value, object-oriented, relational, and NoSQL), the course focuses on relational databases with an overview of some of the more common alternative designs.

Course redesign: Upon arriving at ECU, I was assigned this course. While existing prior to my arrival, its role in the newly established Master of Science in Health Informatics and Information Management (which, like myself, began in the fall of 2013), associated accreditation standards, and my academic and professional experiences, led to a complete redesign of the course.

Taught: Fall 2013, fall 2014, spring 2016, spring 2017, and spring 2018.

COHE 6470 Health Information Privacy and Security

Description: This course provides an overview of privacy, security, and legal issues in health care. In the first of three units, the course focuses on topics such as the Privacy Rule, privacy and confidentiality, patient rights, identity management, elements of compliance programs, ethics, policies and procedures, and legal elements of the health record. The second unit signals the shift from privacy to security, with an overview of the Security Rule, health IT standards, data security, threat identification, risk analysis, disaster recovery, and policies and procedures. The final unit exposes the student to computational techniques including cryptography; access controls; user authentication; and database, data mining, network, and program security. Individual cases, group projects, and hands-on white-hat hacking reinforce the materials presented during lectures.

New course: The course was new when assigned to Dr. Susie Harris and myself. I developed the security and technical portions (units 2 and 3) while Dr. Harris prepared the privacy elements.

Course redesign: I became the solo instructor for the course in the fall of 2015. Unit 1 (privacy) was completely redesigned to comply with accreditation standards and integrate more smoothly with units 2 and 3.

Taught: Team taught with Dr. Susie Harris fall 2014 (approximately 70% assigned to me); solo fall 2015, fall 2016, fall 2017, and fall 2018.

COHE 6490 Foundations of Health Information Technologies

Description: This course exposes the student to a vast array of subjects relevant to the field of health informatics and information management. Covered topics include basic computer science; programming; natural language processing; human computer interaction; clinical data sets, standards, and management; healthcare laws and security; biomedical simulations and simulators; and introductory bioinformatics. Although this course merely presents these areas, each plays a significant role in the operation, facilitation, and improvement of healthcare, and is therefore rife with valuable information for future healthcare administrators. Being a survey course, there will be a great deal of required reading. Performance will be measured on retention, application, and implementation of the covered material.

New course: The course was new when assigned to me. Being a survey course, many topics were covered, requiring special handling to avoid exorbitant reading material costs. During this time, ECU libraries was establishing its online textbook catalog. This course was an early adopter of those university provided materials, saving the students hundreds of dollars each year.

Taught: Spring 2014, spring 2015, fall 2015, fall 2016, fall 2017, and fall 2018.

COHE 6550 Health Informatics Project Design and Management

Description: This course exposes the student to a vast array of subjects relevant to the fields of Systems Analysis and Design and Software Engineering applied to healthcare. Topics include health care information systems (HCIS's), health care laws and regulations pertaining to HCIS's, the Systems Development Life Cycle, the Unified Process, project management, time and cost estimation, data capture and display, and the Unified Modeling Language to name a few.

Course proposal: Two courses external to my department (MIS 6843 and SENG 6230) were required for the MS in Health Informatics and Information Management at the time. After reviewing both syllabi, it had been determined that: (1) there was significant overlap in the two courses, (2) the subject matter was taught from a perspective and level inconsistent with our students' backgrounds, and (3) the unique challenges facing health care professionals in these domains were not being addressed. Furthermore, as we were seeking accreditation from the Commission on Accreditation for Health Informatics and Information Management (CAHIIM) at the time, control over content was paramount. Thus, the graduate faculty in my department decided to combine the two to form COHE 6550.

New course: After the course proposal was approved, I began generating content. As COHE 6550 replaced two existing courses, it was decided to offer it in the summer of 2015 to minimize student plan of study disruptions.

Course redesign: After the summer of 2015, the course was moved to spring, for which it had to be redesigned. Content was expanded, lectures rewritten, and materials updated pursuant to student comments and suggestions.

Taught: Summer 2015, spring 2016, and 2018

Relief: Spring 2017 course relief from VCAN grant buyout.

HSMA 4065 Management of Health Care Operations and Patient Flow

Description: This course focuses on the analysis and management of patient flow within health care organizations through the application of queuing theory, system dynamics, and discrete event simulation.

Taught: Team taught with Dr. Xiaoming Zeng spring 2017 (50% assignment)

Temporary assignment: This was a one-time, temporary assignment necessary after the designated instructor left ECU shortly before the semester began. Neither of us were familiar with the topic and had to learn the material as the semester progressed. Dr. Zeng has since assumed sole responsibility for the course.

PUBH 8463 Health Information Systems

Description: This course exposes the student to various aspects of health information systems (HIS). It begins with an introduction to the domain; expands into data, data management, and decision making; and concludes with systems analysis and design. During the semester, students work on a project of their choosing, adapting course materials to suit their requirements. The intent is to (1) illustrate the challenges faced by researchers and policy makers in locating, integrating, and analyzing public health and related data, (2) explore and visualize information for decision making purposes, (3) identify data quality concerns and information gaps, (4) recommend best practices for data collection, storage, and interoperability, and (5) provide evidence-based decisions.

New course: When assigned, the course existed as a proposal alone. I am developing it as the semester progresses. My intent is to provide students with hands-on experience in an area of their choosing (e.g., dissertation-related), guide them through the difficulties of data wrangling and merging, and exploring systems analysis and design (relying on experience gained herein). It is not about the results, but the process and work toward becoming successful, self-sustaining researchers, and having a greater understanding and appreciation for health information systems.

Taught: Fall 2018.