

COHE 6430  
Database Systems in Health Care

**Included:** Spring 2018, Spring 2017, Spring 2016, Fall 2014, and Fall 2013 (*only latest year included in this sample*)

# **COHE 6430 Database Systems in Health Care**

## **Reporting year: 2017-2018**

Prior to the start of the semester, I asked each student to complete a brief survey on his/her background. Five of the original seventeen indicated a technical aptitude either from industry or academic experience. Post-drops (one technical and two non-technical students), the class was unbalanced with a ratio of 10:4 non-technical to technical students. Accordingly, I began with a minimal amount of complexity, carefully monitored progress, and adjusted where appropriate. The details of this process can be found in Hylock, R. & Harris, S. (2016, Spring). Healthcare Database Management and HIIM Students: Challenges and Instruction Strategies – Part 1. Educational Perspectives in Health Information Management.

As with fall of 2013, fall 2014, spring 2016, and spring 2017, my goal is to provide enough rudimentary information to allow the novices to keep pace while not feeling overwhelmed, yet add a touch of complexity to somewhat challenge the experienced. Based on student suggestions, assignment quality, exam results, and learning assessment outcomes from the previous years, I adjusted assignments, exams, and lectures. More specifically, I rewrote virtually all assessments to incorporate more piece-wise incremental/combination steps (both documented in Hylock, R., & Harris, S. (2017, Summer). Healthcare Database Management and HIIM Students: Challenges and Instruction Strategies – Part 2. Educational Perspectives in Health Information Management). The problems are virtually the same; it is the delivery that has changed. As a result, student performance and comprehension increased as determined by learning outcomes and student work, while reducing student apprehension and concern (roughly gauged through conversations with students in person and via email). Average pre-final student grades (the point of comparison as of this writing) are 3-7% higher than prior years overall. Regarding the two most difficult concepts, modeling and SQL, average grades this semester are 1-8% and 9-12% higher than prior years respectively.

As with prior semesters, the trend of a student's success being unrelated to his or her technical background is holding. As of this report, four out of the top five students have non-technical backgrounds. Those with technical backgrounds and abilities are scattered from 4-12 (in terms of rank). This is further evidence that this course is able to present the material in such a way that prior knowledge is not a prerequisite for students to learn and apply the concepts of the course.

Regarding the textbook, I currently require Modern Database Management, 11th edition by Hoffer, Ramesh, and Topi. Since the 8th edition (the earliest I have), nothing has changed except the price, which is approaching \$300. However, as there does not exist a textbook for health care, and most are highly technical, it is one of only a few viable options for our students. That said, it is still woefully inadequate for the course and I rarely make use of it, other than to have students read the chapters for partial reinforcement. As a result, I have started writing my own textbook with a health care focus. I have no timeline or publisher agreement, just an outline, slides, assessments, and a lot of ideas. The plan is to begin with a few chapters on concepts and techniques that vary greatly from the Hoffer textbook and give them to the students. Over time, I will complete the textbook and try to find a publisher (which may happen prior to or after completion).

In future iterations, I will continue to evaluate student progress throughout the semester and adjust accordingly, while maintaining a minimum level of education (details can be found in the publications discussed prior). The diverse student body in health informatics and related disciplines produces a non-standard profile for each course. Thus, it is imperative flexibility be included in each offering to promote maximum learning in that environment.

COHE 6470  
Health Information Privacy and Security

**Included:** Fall 2017, Fall 2016, Fall 2015, and Fall 2014 (*only latest year included in this sample*)

# **COHE 6470 Health Information Privacy and Security**

## **Reporting year: 2017-2018**

The course is segmented into three units: privacy law, security law, and technical security respectively. The legal sections comprise pre-midterm and the technical, post-midterm material. Accompanying each major theme (i.e., privacy and security) is a group project. The privacy project requires each group to create a workforce training plan based on selected HIPAA Privacy Rule specifications, prepare detailed policies and procedures for the Administrative Requirements of the Privacy Rule, and convert those policies and procedures into lecture-based training materials. The security project is based on the analysis of a real system – my cluster. Each group selects several Security Rule provisions along with two I explicitly provide. They then create a list of questions for an interview with the cluster administrator (played by me) to determine whether the system is compliant with the selected Security Rule statutes. The interview is conducted synchronously online using SabaMeeting, which promotes follow up questions and allows me to interject with guidance and expand the discussion when necessary. The final report is an analysis of the interviewee's answers. If a violation is identified, the team must correct the issue with a written policy and procedure. If not, then they must explain how and why it is compliant. A new category was added last semester to encompass those in between – potential violations. If identified, the group details why it is unclear, then provides questions and potential answer necessary to formulate a final decision based on the original two categories. As with the previous semester, students responded positively to these projects, especially security.

Following the prior semesters, technical security concepts were taught in conjunction with extensive examples. The tutorial websites and blog were heavily utilized in the course. The websites provide examples such as encryption and decryption of symmetric and asymmetric messages, digitally signing communications, password cracking, and website/database hacking (ethical techniques). It underwent a minor overhaul prior to this semester as I cleaned the code and added new topics consistent with industry practices. Additionally, I maintain detailed blogs on most of the cryptography subjects, complete with working Java code students can implement (I do not share the hacking tools). Student feedback to these sites has been very positive. They enjoy the hands-on aspect and their ability to manipulate the examples to better understand the mechanisms at work. Some find it quite sobering when they realize their passwords are very easy to break, and everyone seems to enjoy ethically hacking the fictitious healthcare website, which is done in two ways: (1) they deploy various SQL injection attacks to access the underlying database and (2) they gain access to a provider's account by exploiting the same password attempt flaw as experienced by Apple with the August 31, 2014 iCloud hack of celebrity photos.

One activity students have repeatedly stated they enjoy are the blogging assignments (Blackboard's blog tool). Every student must write a 500-1,000-word original blog post for each of the two major themes (privacy and security). Then, for each theme, they must provide two 250-500-word commentary replies to another student's original posting. Students have written about personal experiences, training received, articles read, and summarized Enforcement Rule violations to name a few. The use of blogs in this course has been so successful, I am trying to find ways of integrating it into other courses. Furthermore, I have learned quite a bit by reading these posts and following up with students on some of the subjects. Several students have indicated their interest in writing case studies about their experiences for academic publication.

Overall, student performance was exceptional. In the future, I will continue to update and modify the material to be as current and relevant and possible. Additionally, based on student performance, assignments, lectures, and exams will be refined. Furthermore, this course will soon overlap with the BS in HIM, which will require modifications to suit the requirements of both the students and accreditors.