ITMS 428-528 Database Security
Spring 2015 *Hosea Lee*

Syllabus

Professor: **Hosea Lee**
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Email: *hlee110*@iit.edu
Office(s): Main Campus - Classroom
Office Hours: Main Campus: Wednesday 6:00-6:25pm, 9:05-9:30pm
Online: Via *GoogleTalk* or by telephone (through appointment only)

Course Catalog Description: Students will engage in an in-depth examination of topics in data security including security considerations in applications and systems development, encryption methods, cryptography law and security architecture and models.

Prerequisites: ITMD 421

Credit: 3-0-3 *(lecture courses)* Semester Hours

Course Outcome: Each student will learn the fundamentals of database security as well as concepts and technologies such as encapsulation (information hiding) and using relational database security management techniques. They will be conversant with database hardening on a variety of platforms, defense against the most common threats and attacks, and the legal and regulatory environment impacting database security.

Lecture Days, Time & Place: Wednesday 6:25pm to 9:05pm, *LS 121*,
10 W. 33rd Street on IIT's Main Campus, or online via IIT Online.

Schedule of Topics/Readings: ***You should do all readings prior to class.***

Session	Date	Topic	Reading
1	August 26	Introduction: Security and Information Technology	Chapter 1
2	September 2	Database Review (decide research project topic and team)	Chapter 2
3	September 9	Database Hardening: MySQL	Chapter 3
4	September 16	Database Hardening: SQL Server (research paper outline is due)	Chapter 4
5	September 23	Database Hardening: Oracle	Chapter 5
6	September 30	Passwords, Profiles, Privileges, and Roles	Chapter 6
7	October 7	SQL Injection I: Identification Midterm Examination (1hr)	Chapter 7
8	October 14	SQL Injection II: Exploitation and Defense	Chapter 8
9	October 21	Encryption (research paper deadline before class)	presentations
10	October 28	Securing Big Data	presentations
11	November 4	Cloud-based security	presentations
12	November 11	Regulations and Compliance	presentations
13	November 18	Database Security Auditing	Chapter 9
14	November 25	No School – Thanksgiving holiday	
15	December 2	Database Security Testing	Chapter 10
16	December 9	Final Examination as per the IIT Final Exam schedule	

***Textbook*:** The textbook for this course is **mandatory.**
Basta, Alfred & Melissa Zgola, Database Security, 1st Ed. Cengage Learning 2011 ISBN: 978-1435453906

Readings/Videos: Readings for the class will be assigned from the textbook as well as in the form of online reading. Online resources and videos will be linked from or embedded in a Blackboard page. It is essential that you do all readings and/or view the videos before coming to class on the assigned date. These materials are a necessary and integral part of the class and will form the basis for any class discussions on the topic. Specific readings are assigned by topic above.

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Course Objectives: At the conclusion of this course, each successful student will able to:

- Recall and describe concepts of information security
- Describe and explain security architectures for protection of database resources
- Secure and harden database deployments using leading industry-standard database management systems
- Recall and describe access control approaches, including authentication, authorization, privileges and roles
- Discuss cryptography and encryption
    - o Identify elements of a cryptographic system
    - o Describe how crypto can be used, strengths and weaknesses, modes, and issues that have to be addressed in an implementation
- Describe the technical details of SQL injection attacks
- Explain how to protect against SQL injection attacks
- Discuss issues and recall techniques and best practices in the protection of Big Data and data in the cloud
- Recall and describe legal and regulatory compliance issues in database protection
- Describe and discuss the processes of auditing and testing database security

Course Notes: Copies of the course lecture notes in the form of a PDF of the PowerPoint presentation accompanying each lecture will be provided for each student on Blackboard. This should be useful if you must miss a class. You should be aware that note taking is encouraged and should help your understanding of the material.

Course Web Site: http://blackboard.iit.edu/

Blackboard: The course will make intensive use of Blackboard (http://blackboard.iit.edu/) for communications, assignment submissions, group project coordination, providing online resources and administering examinations. All remote students will view the course lectures online via Blackboard, and online readings will be found on Blackboard.

Guest Lectures: Guest lecturers may be featured as part of course topics. When a guest speaker is expected you should make an extra effort to be seated and ready prior to class time. Guest lectures may be in the evening in which case class will not be held during a scheduled morning period. A question & answer/ discussion period will be held at the end of each lecturer's presentation.

Attendance: If you are in a live section of the class and will not be able to attend class, please notify me via email or by text message to 847.920.8442 prior to class time. Live section students who miss a class should always watch the lecture online.

Assignments: There will be two main assignments for this class.

Assignment 1 - Graduate Students: A research paper addressing a topic in *whatever you specify*. The paper will be fifteen to twenty pages long and will meet standards expected of a paper submitted for journal publication. Instructions for submission of the paper will be included with the assignment on Blackboard. You must fully attribute all material directly quoted and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. *Failure to format your bibliography entries in APA style will result in an automatic reduction of one letter grade for this assignment.* No more than thirty-three percent of material included in any paper may be direct quotes. No more than sixty percent of the resources cited may be from online. Submission of the paper for actual publication is highly encouraged. A basic outline for your paper—which should be at least three pages in length—will be due February 26th. The paper will be due April 9th. More specific instructions for the outline and the paper will be provided on Blackboard.

Assignment 1 - Undergraduate Students: Two three-page research papers each addressing a topic in *whatever you specify* in more depth than it may covered in the course. The three pages should be content and do not include cover page, bibliography, charts, diagrams, figures, appendices or other included materials. Topics should be of particular interest to you and may be more technical in nature than the course. Papers must have a complete bibliography citing a minimum of five sources *other than* the textbook or class notes. You must fully attribute all material directly quoted and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. *Failure to format your bibliography entries in APA style will result in an automatic reduction of one letter grade for this assignment.* No more than thirty-three percent of material included in any paper may be direct quotes. No more than sixty percent of the resources cited may be from online. These papers will be due February 19th and April 2nd. More specific instructions for the outline and the paper will be provided on Blackboard.

Note: I will not provide topics for research papers. Topic selection is an important part of the research process. There is an enormous and expansive variety of topics in this field and with a little work on your part arriving at a topic should not be difficult at all. Topics should be very specific as you will be covering it in a relatively short amount of writing and you want to reflect an in-depth coverage of your topic which you can not do with a very broad topic. *(It's really up to you about topics; this is how I do it.)*

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Blog and Quizzes: Each student will make an entry in the course blog in Blackboard each week of the course except the final week—and yes, this includes Spring Break. Blog entries may be links to online articles addressing topics applicable to the course, or may be personal reflections or opinions on topics applicable to the course. Each week all students must read all of the blog entries from the preceding week. Completion of appropriate blog entries and reading of the blog will be included in your class participation grade.

I may give quizzes at my discretion and may use them for verification that you have completed assigned course readings or have read the blog entries. Quizzes may be online via Blackboard. As they are discretionary, the weight of quizzes in grading is also left to my discretion and will be included in your class participation grade. *If I see a regular pattern of comments on other student's blog entries, I will not need to give any quizzes in this area.*

Examinations: The final examination will consist of an in-class essay examination measuring course outcomes as discussed above. The examination will be open-book, open note, and open-Web.
Internet students may complete this exam online. *(See exam statement for other options)*

Academic Honesty:

Plagiarism: All work you submit in this course **must be your own**. You must fully attribute **all** material directly quoted in papers and you must document all sources used in the preparation of the paper using complete, APA-style bibliographic entries. Including directly quoted material in an assignment without attribution is always plagiarism and will always be treated as such by me. No more than thirty-three percent of material included in any paper may be direct quotes. Students have submitted plagiarized material the last six times I have taught this course and **I will not tolerate it**. If you submit plagiarized material you **WILL** receive a grade of **ZERO** for the assignment, an Academic Honesty Violation Report will be filed, and it may result in your expulsion from the course with a failing grade as per the IIT and ITM academic honesty policies. **There is no excuse for not understanding this policy** and if you do not understand it please let me know and I will be happy to discuss it with you until you do. *(Should include assignment or lab collaboration statement as necessary.)*

Grading: Grading criteria for ITMS 428-528 students will be as follows:

A	*Outstanding work reflecting substantial effort*	90-100%
B	*Excellent work reflecting good effort*	80-89.99%
C	*Satisfactory work meeting minimum expectations*	70-79.99%
D	*Substandard work not meeting expectations*	60-69.99%
E	*Unsatisfactory work*	0-59.99%

Grading criteria for ITMS 428-528 students will be as follows:

A	*Outstanding work reflecting substantial effort*	90-100%
B	*Adequate work fully meeting that expected of a graduate student*	80-89.99%
C	*Weak but marginally satisfactory work not fully meeting expectations*	65-79.99%
E	*Unsatisfactory work*	0-64.99%

The final grade for the class will be calculated as follows:

Research Paper & Presentation	**30%**
Midterm Exam	**20%**
Final Exam	**30%**
Class Participation including Blog and Quizzes	**20%**

Other Class Resources: Online readings and other class resources may be found at on Blackboard.

Our Contract: This syllabus is my contract with you as to what I will deliver and what I expect from you. If I change the syllabus, I will issue a revised version of the syllabus; the latest version will always be available on Blackboard. Revisions to readings and assignments will be communicated via Blackboard.

Disabilities: Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are listed on the first page of the syllabus. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312.567.5744 or disabilities@iit.edu.