

**CIS 483-75**  
**Introduction to Database Security**

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	Office Hours: MTh 3:00pm – 5:00pm, or by appointment

**Course Syllabus**

**Course Description (from the UofL Catalog)**

Prerequisite: CIS 310. Basic data protection methods such as discretionary and mandatory access controls, secure database design, data integrity, secure architectures, secure transaction processing, information flow controls, and auditing, copyright and database protection, privacy issues (including employee records and HIPAA). Security models for relational and object-oriented databases, security of databases in a distributed environment, survey of commercial systems, and research prototypes.

**Course Objectives**

This course is designed to teach you about the design and implementation of secure databases. Emphasis will be placed on multilevel security in database systems, covert channels, and database auditing for relational database systems. You will achieve the following goals through attendance at lectures, hands-on exercises, and completion of out-of-class assignments:

- Learn the fundamental concepts in database security.
- Understand how access controls work in a database.
- Learn how to develop and manage secure database architectures.
- Be familiar with the laws governing computer privacy.
- Understand the alternatives to encrypting stored data for security.
- Understand how commercial systems such as SQL Server and Oracle enforce security and their vulnerabilities.
- Learn the security audit methods involving databases.

**Prerequisites**

CIS 310 Database Design and regular standing in the College of Business are required prerequisites. You are expected to have a solid and practical foundation for the design and implementation of database systems. Emphasis will be on relational database models.

### Course Materials

#### 1. Highly Recommended Textbook

- Implementing Database Security and Auditing by R. B. Natan © 2005 (Publisher: Digital Press)  
(ISBN-10: 1555583342 | ISBN-13: 978-1555583347 )

#### 2. Other Supplemental Books

- Database Security and Auditing by Hassan Afyouni, Course Technology, MA 2006, ISBN: 0-619-21559-3.
- Effective Oracle Database 10g Security by Design by David C. Knox, McGraw-Hill Osborne Media, NY 2004, ISBN: 978-0072231304.
- Database and Applications Security by B. Thuraisingham, Auerbach Publishers, 2005, ISBN: 0-8493-2224-3
- Database Security by Silvano Castano, Maria Fugini, Giancarlo Martella, and Pierangela Samarati, ACM Press Books, 1995, ISBN: 0788165429.
- Information Security: An Integrated Collection of Essays by M. D. Abrams, S. Jajodia, and H. J. Podell, IEEE Press, 1995, ISBN: 0-8186-3662-9.
- SQL Server Security by C. Andrews, D. Litchfield, B. Grindlay, McGraw-Hill Osborne, NY 2003, ISBN: 0-07-222515-7.
- SQL Server Security by M. Lewis, 2nd edition, Apress, NY 2004, ISBN: 1-59059-219-0.
- Oracle Security by Marlene Theriault and William Heney, O'Reilly Publishers, 1998, ISBN: 1-56592-450-9.
- Database Systems: Design, Implementation & Management, 6th edition by P. Rob and C. Coronel, Course Technology, 2004, ISBN: 0-619-16033-0.

### Course Hardware and Software

This course requires laptop, and will be requested to bring your laptop to the class for hands-on exercise. Your laptop must have MS SQL Server 2005 installed. The recommended operating system is Windows 7. MS SQL can be downloaded from the Microsoft Developer Network Academic Alliance (MSDNAA) site:

[http://msdn08.e-academy.com/louisville\\_cis](http://msdn08.e-academy.com/louisville_cis)

You can install MS SQL in a virtual environment using VMware. VMware can be downloaded from:

<http://e5.onthefhub.com/WebStore/Welcome.aspx?ws=92418b8d-a432-de11-9d57-0030485a8df0>

### Attendance Policy

Although attendance will not be taken you are expected to attend class lectures and participate in class discussions. You are responsible for all material covered in lectures whether you are present or not. Lectures will not only be used to illustrate and expand on the material in the textbook, but will also include material available only during lecture that will appear on the tests.

Lecture presentations assume that you have read the assigned material before coming to class and are prepared to ask questions during class. If you don't ask questions, then I will assume that you understand the material. If there is a topic you do not understand, **it is your responsibility** to seek clarification from me during lectures or during office hours, or from other students. If you miss a lecture, **it is your responsibility** to get the notes and announcements from a classmate and to view (if available) the Tegrity Session of that class.

### Time Commitment and Planning

Any university course requires a large amount of work outside of lecture. I assume that when you register for this course you will allocate an average of at least five to ten (5-10) hours per week, in addition to lectures, to study the CIS 483 textbook, complete the homework assignments and projects, and prepare for tests. It is your responsibility to manage your workload. If you procrastinate starting your assignments, you may find that you do not have enough time to complete the assignments, or that a technology problem may prevent you from completing your assignment. Note that not being able to access a computer or network will not be considered an acceptable excuse for submitting your assignment late.

### Classroom Behavior

**Cellular telephones, pagers, PDAs, music players and other electronic devices that can distract you and other students must not be used in the classroom.** Please remember to turn off the audio ringer on your cell phones and pagers before entering the classroom. Under no circumstances should you use a phone, pager or PDA while class is in session. If your cell

phone rings during class or you are involved in any other form of disruptive behavior that creates a disturbance in class (such as reading a newspaper, sleeping, texting/IM'ing, or having extended conversations), you may be asked to leave the classroom.

Similarly, while you may use your laptop computer during class to take notes, using your laptop in a way that distracts other students around you or otherwise disrupts the class (e.g., surfing the web, reading email, or playing audio/video recordings) is not permitted, and may result in you being asked to leave the classroom. You should plan to arrive before class begins and not leave until after class ends. This is an issue of respect for everyone involved – not just for the instructor, but also the students whom you disturb with your late entry and/or early departure. If you arrive late to, or must leave early from, a lecture, please sit near an exit in the back of the classroom.

### **Assessments**

Your overall final course letter grade will be determined by your grades on the following assessments.

<b>Tests</b> – Midterm @ 100 points – Final @ 150 points	250 points
<b>Homework Assignments</b> – Seven (7) lab assignments @ 20 points each – One mini term paper @ 60 points	200 points
<b>Class Participation</b>	50 points
<b>Total</b>	<b>500 points</b>

I maintain the right to curve the two exam grades. Your final grade is based on the total points you have earned over the semester. The expected grade distribution for this course is as follows:

97% – 100%	A+
93% – 96.9%	A
90% – 92.9%	A-
87% – 89.9%	B+
83% – 86.9%	B
80% – 82.9%	B-
77% – 79.9%	C+
73% – 76.9%	C
70% – 72.9%	C-
67% – 69.9%	D+
63% – 66.9%	D
60% – 62.9%	D-
0% – 59.9%	F

I maintain the right to curve the final course letter grades. Any curve for the final course letter grades will be based on general College guidelines, historical course trends, and the overall performance of the class. I will guarantee that the curve will not hurt your grade; however, you should not expect the curve to make a substantial improvement in your grade.

### **Important Note Regarding Grade Appeals**

Grade appeals for any assessment must be requested (either in writing or via email to me) within seven (7) days after the grade for the assignment has been posted to Blackboard. While I will always answer your questions on the grading of an assessment, your score on the assignment will not be changed unless you request a grade review during the 7-day grade appeal time period. If you want to make a case for re-grading your work based on another student's grade on the same Homework Assignment or Test, the professor will review and then re-grade your work as well as the other student's work entirely from scratch.

### **Summary of Assessments**

- **Tests:** There will be a total of two (2) Tests during the semester. Each Test is expected to last the full class session and will include brief essay questions taken largely from the textbook, slides, and in-class discussions.

**Missing an Exam:** Test dates are noted on the Course Schedule. You could miss a Test for three reasons. Here are the policies for each:

1. You have a scheduled conflict that you can identify by the second week of classes. For example, you may have a Dean's Excuse for official University athletic team and school-sponsored organizations. In this case, you will be allowed to take the Test **early** and **only if** you tell me by the end of the second week of class.
2. An emergency comes up before the Test. For example, a family emergency that requires you to leave Louisville. In this case, you may take the Test at another time **only if**
  - a. You discuss the problem with me or at least email or voice mail me **before** the Test **AND**
  - b. You have **written documentation** that the emergency occurred. Written documentation may include an Athletic Department Excused Absence memo, note on letterhead paper from a physician, hospital discharge paperwork, family member obituary notice, etc. The written documentation must include the phone number of someone who can verify the emergency. We will set the make up time very soon after the regular Test time, and you will likely get a different Test.
3. You sleep through the Test, you do not contact me before the Test, or you cannot provide satisfactory proof of one of the above reasons. In this case, you will receive a zero on the Test.

- **Homework Assignments:** You will be required to perform the activities in your Homework Assignments. These are intended to help you understand database security issues well. For all of these Homework Assignments, you may work individually or in small team of two (2) students. You must read the Homework Instructions located in the BB > Assignments > Homework folder before completing any Homework Assignment.

All Assignments are due on the dates indicated on the Course Schedule **by the due date and time**, unless otherwise notified by the professor. Assignments not submitted by the due date and time specified in the Schedule **will be penalized by 20% per every 24 hours** (e.g., 20% between the deadline and the next 24 hours). Technology-related issues are not considered a sufficient justification for submitting Assignments after the due date. Do not wait until the last minute to submit an assignment into Blackboard.

### **Request for Accommodations**

The University of Louisville is committed to providing access to programs and services for qualified students with disabilities. If you are a student with a disability and require accommodation to participate and complete requirements for this class, notify me immediately and contact the Disability Resource Center (<http://louisville.edu/disability>, Robbins Hall, 852-6938) for verification of eligibility and determination of specific accommodations. In addition, please provide me the required accommodation letter from the Disability Resource Center.

### **CIS Academic Dishonesty Statement**

The CIS faculty takes violations of the university policy on academic dishonesty seriously. Students are encouraged to review the policy and to understand the consequences of any action that is proven to be a violation of the policy.

Students are expected to do their own work when assignments and tests require individual work. For example, students may not copy the work of others, either manually or electronically, under these conditions. Further, students who allow their work to be copied by others risk violation of the academic dishonesty policy.

The CIS faculty will take full and complete action against any student who violates the academic dishonesty policy. In proven cases of violation of the policy, a student may be suspended from the College of Business as stipulated in the University of Louisville undergraduate and graduate catalogs. Cases of academic dishonesty will be processed in accordance with the College of Business procedures.

### **Code of Student Rights and Responsibilities**

"Every student is expected to be thoroughly familiar with the University's Code of Student Rights and Responsibilities and Student Conduct which can be found in the 'General Information' section of this catalog.

Every student is responsible for reading the academic policies in the Undergraduate Catalog and official announcements of the College of Business and for abiding by such regulations.

Specifically, every student is responsible for knowing the grade point averages and program requirements needed for graduation. Students are encouraged to see a CoB academic advisor to clarify any questions or concerns.

Along with preparing for and attending class, each student has the responsibility to promote high academic standards.

Students are expected to cooperate in all classes with faculty members to achieve an optimal learning environment. Inappropriate classroom behavior may result in the student being withdrawn from the course, and potentially assigned academic penalties. Inappropriate classroom behavior will be dealt with in the same manner as academic dishonesty.

The CoB will not tolerate academic dishonesty. The CoB has a strong policy of academic discipline for action against students who commit academic dishonesty or conduct themselves inappropriately in the classroom. A proven case of academic dishonesty will normally result in the student being denied admission to or dismissed from the CoB.

Academic dishonesty is defined by the Code of Student Conduct in the Undergraduate Catalog. Its definition pertains to but is not limited to cheating, fabrication, falsification, multiple submission, plagiarism, and complicity. It is the student's responsibility to maintain high standards of ethical conduct, and intellectual integrity and to be familiar with the definition of academic dishonesty.

As evidence of the seriousness with which the CoB regards these matters, academic dishonesty allegations are handled in accordance with CoB Procedures for Dealing with Academic Dishonesty."

*(Excerpt from the University of Louisville Undergraduate Catalog, Summer 2006 through Fall 2008, page 43.)*

In the case of proven academic dishonesty, the instructor reserves the right to impose a more severe penalty (such as giving the student an "F" for the class) than is required under University or College of Business policy.

**Understanding Plagiarism:** (compliments of the Writing Center at Hamilton College in Clinton, New York). Please get a copy of this article using the following URL and read it thoroughly.

[https://my.hamilton.edu/academics/resource/wc/Using\\_Sources.PDF](https://my.hamilton.edu/academics/resource/wc/Using_Sources.PDF)

### **Americans with Disabilities Act**

"The University of Louisville is committed to providing equal opportunity for persons with disabilities. This commitment includes complying with the Americans with Disabilities Act of 1990 (ADA), and Sections 504 and 508 of the Rehabilitation Act of 1973. In addition, all of the University's websites and online courses will comply with the web page design standards established by the World Wide Web Consortium (W3C). The University of Louisville strives to maintain a barrier-free, welcoming environment for everybody.

The ADA Coordinator, located in the Affirmative Action Office (502 852-6688), will monitor compliance and assist all unit heads in meeting equal opportunity obligations. The University Disability Resource Center staff (502 852-6938) will assist the University community by serving as an information resource center and coordinating support services for students with disabilities. No otherwise qualified individual with a disability shall, solely by reason of such disability, be excluded from participation in, be denied benefits of, or be subjected to discrimination in University programs. The President, Board of Trustees, Student Government, Faculty and Staff Senates affirm the University's long standing and continuing commitment to Equal Opportunities for persons with disabilities."

*(Excerpt from the University of Louisville Undergraduate Catalog, Summer 2006 through Fall 2008, page 43.)*