5670 Database Security and Auditing

SEMESTER:	Fall 2013	**CRN:**	45525
INSTRUCTOR:	Li Yang	**E-MAIL:**	Li-Yang@utc.edu
LECTURES:	F 9:00 - 11:30pm	**LOCATION:**	EMCS 306
PHONE:	423-425-4392	**OFFICE:**	EMCS 314A

OFFICE HOURS: M/T 8:30 am-12:00pm and W 9:00-11:00am

CREDIT: 3 hours

ADA STATEMENT: Attention: If you are a student with a disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) and think that you might need special assistance or a special accommodation in this class or any other class, call the Disability Resource Center (DRC) at 425-4006 or come by the office, 102 Frist Hall **http://www.utc.edu/Administration/DisabilityResourceCenter/.**

If you find that personal problems, career indecision, study and time management difficulties, etc. are adversely affecting your successful progress at UTC, please contact the Counseling and Career Planning Center at 425-4438 or **http://www.utc.edu/Administration/CounselingAndCareerPlanning/.**

COURSE DESCRIPTION

Database security has a great impact on the design of today's information systems. This course will provide an overview of database security concepts and techniques and discuss new directions of database security in the context of Internet information management. The topics will cover database application security models, database and data auditing, XML access control, trust management and privacy protection.

PREREQUISITES

CPSC 3220 and 3600 with grades of C or better.

COURSE OBJECTIVES

The expected results from this course are:

- Master the security architecture
- Master the principles of access control and its application to database security
- Understand administration of users
- Understand the databases security models
- Master virtual private databases
- Master multilevel secure relational model and poly-instantiation
- Master auditing in relational databases

- Understand XML access control and enforcement.

COURSE OUTCOMES
- Students are able to design and implement access control rules to assign privileges and protect data in databases.
- Students are able to implement access control rule to secure data stored in databases. They use Oracle and Microsoft SQL server.
- Students implement Virtual Private Database to protect data in databases.
- Students implement database auditing.
- Students learn and practice various access control theories and techniques including mandatory access control, discretionary access control, role-based access control.
- Students are able to give a presentation and write reports.

- **CLASS PARTICIPATION/ATTENDANCE POLICY:** Regular class attendance. Active class and laboratory participation in all discussions; this means spending some quality time reading and preparing for class and lab meetings and discussions.

LATE ASSIGNMENT SUBMISSION/MAKE-UP POLICY: There will be no make-up tests. **Failure to take the final exam will result in failing the course.** All assignments are to be turned in on or before the assigned due date. You must demonstrate that your lab or assignment is working properly. **No assignment will be accepted and a grade of zero will be assigned for that assignment.**

COURSE REQUIREMENTS

- One mid-term and a comprehensive final examination will be given.
- Individual extra credit assignments for the purpose of propping up a bad grade will not be given.
- Students will be required to sign a contract stating that they will not use knowledge acquired in this course for illegal or unethical purposes. This contract may be released to appropriate authorities should the student be suspected of illegal or unethical computer usage.
- Taking notes is encouraged.

EVALUATION/ASSESSMENT:
Grades will be based on the following:

40% Laboratory (team) projects (Projects will be assigned on a 2 or 3 week-basis and each project will demand a 5-page, double-spaced, typewritten report).
15% Mid-term examination – covering text material and content of class discussions.
20% Final comprehensive examination – covering text material and content of class discussions
20% **term project** and presentation
5% attendance

Final Grade will be determined by the standard UTC grading policy with the exception that there will be no D grade given. You must make a C or better to continue with your course work. Incomplete (I) will not be given in this course.

Score   Letter Grade

90-100	A
80-89	B
70-79	C
Below 70	F

TEXTBOOKS: Primary texts

- Sam Afyouni, Database Security and Auditing: Protecting Data Integrity and Accessibility. Thomson. ISBN: 0-619-21559-3, 2005.

TEXTBOOKS: Recommended texts

- Ron Ben-Natan, Implementing Database Security and Auditing, Elsevier digital press. ISBN: 1-55558-334-2. 2005.
- Oracle 10g Programming: A Primer by Rajshekhar Sunderraman, Addison Wesley
- Marshall D. Abrams, Sushil Jajodia, and Harold J. Podell, eds. *Information Security: An Integrated Collection of Essays*, IEEE Computer Society Press, 1995.
  Available on line at http://www.acsac.org/secshelf/book001/book001.html
- We will also draw material from the literature in the relevant journals and conferences (e.g., SIGMOD, VLDB, IEEE S&P, CCS). Students will read and present the selected papers and to complete a term project.

TENTATIVE COURSE OUTLINE
Topic 1:   Course Description and Security Architecture
Topic 2:   Operating System Security Fundamentals
Topic 3:   Administration of Users, Access Control
Topic 4:   Privileges, passwords, roles, Access Control Models
Topic 6:   Discretionary Access Control and Role-based Access Control
Topic 7:   Mandatory Access Control
Topic 8:   Database Application Security Models, SQL injection
Topic 9:   Database Encryption and Masking
Topic 10:   Virtual Private Databases
Topic 11:   Database Auditing Models
Topic 12:   Application Data Auditing
Topic 13:   Multilevel Secure Relational Model
Topic 14:   Watermarking

COURSE WEBSITE AND COMMUNICATION:
To enhance student services, the University uses your UTC email address for all communications. (See http://www.utc.edu/ for your exact address.) Please check your UTC email on a regular basis [here you might add what you consider a regular basis to be]. If you have problems with accessing your email account, contact the Help Desk at 423/425-4000.   We will be using the Blackboard system (**bb4.utc.edu**). You may access lecture notes, assignments, and your grades through this system. I will use the blackboard system to communicate with you via email. I can be reached by email during the week. I generally read my email on the weekend but **CANNOT** guarantee I will read or answer my email

on the weekend. I will also **NOT** guarantee I will answer my email **after 6 pm**, which includes the night before exams.

INFORMATION ON PLAGIARISM AND CHEATING (from the UTC Student Handbook):

PLAGIARISM:

Please read and heed the following information regarding academic dishonesty. The instructor cannot and will not tolerate academic dishonesty. For more information, refer to the UTC Student Handbook. What is cheating?

- Supplying or using work or answers that are not your own.
- Providing or accepting assistance with completing assignments or examinations.
- Faking data or results.
- Interfering in any way with someone else's work.
- Stealing an examination or solution from the teacher.

 What is plagiarism?

- Copying a paper from a source text without proper acknowledgment. NOTE: All references should use the APA Style for formatting.
- Buying a paper from a research service or term paper mill.
- Turning in another student's work with or without that student's knowledge.
- Copying materials from a source text, supplying proper documentation, but leaving out quotation marks.
- Paraphrasing materials from a source text without appropriate documentation.
- Turning in a paper from a term paper website.

The instructor of this class reserves the right to submit papers to the UTC Online (Blackboard) text-matching software (SafeAssign) for review and analysis of originality and intellectual integrity.   If the results of the review indicate academic dishonesty, disciplinary action may be taken against the student as outlined in the UTC Student Handbook.

Important Dates

Class begins	August 19
Last Day to Withdraw without a W	September 1
Labor Day holiday	September 2
Midterm grade notifications	September 30-October 4 (Monday-Friday)
Last Day to Withdraw	October 20 with a W
Fall Break	October 21-22

Thanksgiving Holiday	November 28-December 1
Last Day of Classes	December 2
Final Exam	December 4-9