

MET CS 674 Online (Spring 01 2012)
DATABASE SECURITY
Boston University

Instructor: Shawn Carroll

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Online Office hours: by appointment

PREREQUISITE

MET CS 669 or proof of knowledge

COURSE DESCRIPTION

The course provides a strong foundation in database security and auditing. This course utilizes Oracle scenarios and step-by-step examples. The following topics are covered: security, profiles, password policies, privileges and roles, Virtual Private Databases, and auditing. The course also covers a list of advanced topics, such as SQL injection. Database management security issues such as securing the DBMS, enforcing access controls, and related issues are also covered.

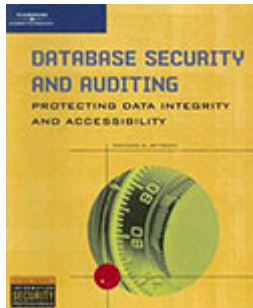
OBJECTIVES

At the completion of the course, you will fully understand how to implement database security on modern business databases by using practical scenarios and step-by-step examples. Hands-on projects using Oracle Database Management System are used to reinforce and showcase the topics presented. Learning objectives for this course are such that you will be able to do the following:

- Understand the fundamentals of security, and how it relates to information systems
- Identify assets in your organization and their values
- Identify risks and vulnerabilities in operating systems from a database perspective
- Learn good password policies, and techniques to secure passwords in your organization
- Learn and implement administration policies for users
- Use Oracle to create policies, profiles and roles
- Understand the various database security models and their advantages or disadvantages
- Learn how to implement a Virtual Private Database using views, roles, and application context
- Gain an overview of auditing fundamentals, and create your own auditing model
- Learn the purpose and use of data dictionaries, encryption, and SQL injection

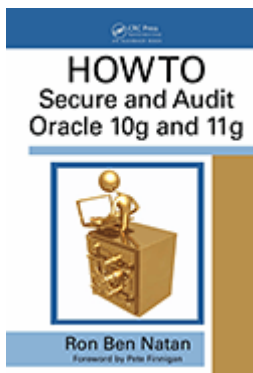
- Explore an interesting topic of your choice related to database security or related topic

REQUIRED TEXTBOOKS



Database Security and Auditing: Protecting Data Integrity and Accessibility
by Hassan A. Afyouni

Publisher: Course Technology; 1 edition (April 6, 2005)
ISBN-10: 0619215593
ISBN-13: 978-0619215590



HOWTO Secure and Audit Oracle 10g and 11g
by Ron Ben-Natan

Publisher: Auerbach Publications; 1 edition (March 10, 2009)
ISBN-10: 1420084127
ISBN-13: 978-1420084122

GRADING STRUCTURE AND DISTRIBUTION

The course will be conducted through online lecture material, book reading assignments, and Live Classroom lectures. Each week will cover one or more core database security concepts and will have at least one lab component, along with a short quiz based on the topics covered that week. The course has a Midterm assignment and a Research Paper assignment. For the Research Paper you are asked to research and provide a summary report on the latest security features of one of the database management systems, or a Database Security topic. In the final module of the course there is a proctored, comprehensive final exam.

The grade distribution is as follows:

Quizzes	10%
Labs/Lab Book and the Security Issues Assignment	15%
Discussions/Participation	10%
Research Paper	20%
Midterm Assignment	20%
Proctored Final Examination	25%

All assignments must be completed by the due dates. The due dates are listed within each weekly lesson.

COURSE OUTLINE

Module 1 - Information Security Fundamentals and the Types of Attacks	
Lectures	Readings
- Lecture 1 - Understanding Security - Lecture 2 - Attackers and their Attacks - Lecture 3 - Information Security Framework	- Database Security and Auditing, Chapter 1 - HOWTO Secure and Audit Oracle 10g and 11g, Chapters 1 and 2
Module 2 - Operating Systems and User Administration	
Lectures	Readings
- Lecture 4 - Operating Systems - Lecture 5 - User Administration	Database Security and Auditing, Chapters 2 and 3
Module 3 - Profiles, Passwords, Privileges and Roles	
Lectures	Readings
- Lecture 6 - Authorization - Lecture 7 - Database Applications Security	- Database Security and Auditing, Chapter 4 - HOWTO Secure and Audit Oracle 10g and 11g, Chapters 4 and 15
Module 4 - Virtual Private Database	
Lectures	Readings
- Lecture 8 - Virtual Private Database - Lecture 9 - How the Virtual Private Database Works	- Database Security and Auditing, Chapter 6 - HOWTO Secure and Audit Oracle 10g and 11g, Chapter 16
Module 5 - Auditing	
Lectures	Readings
Lecture 10 - Auditing	- Database Security and Auditing, Chapters 8 and 9 - HOWTO Secure and Audit Oracle 10g and 11g, Chapters 9, 10, 11, and 12
Module 6 - Advanced Topics (Data Dictionary, Encryption with Oracle, and SQL Injection)	
Lectures	Readings
- Lecture 11 - Data Dictionary - Lecture 12 - Encryption with Oracle - Lecture 13 - SQL Injection	HOWTO Secure and Audit Oracle 10g and 11g, Chapters 8 and 14 (only sections 14.1 and 14.3).
Module 7 - The Final Exam	
Lectures	Readings
The Final Exam	None

SOFTWARE

All of the lab exercises will be completed using a Virtual Machine (VM) that will be available for download in the class. The VM has Oracle Database 11g Release 2 installed on it. Instructions will be given during the class on how to download and run the Virtual Machine.

ACADEMIC CONDUCT POLICY

Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary action. It's important that the work that you submit in this course is your own. Please review the full text of BU's academic conduct code at:

<http://www.bu.edu/met/for-students/met-policies-procedures-resources/academic-conduct-code>