

**MIDSTATE COLLEGE**  
**411 W. NORTHMOOR RD. PEORIA, IL 61614**  
**(309) 692-4092 (800) 251-4299**

**Summer 2018**

**Course number & Name:** CIS 338 Database Management II: Security and Auditing

**Credit hours:** 4 Quarter Hours    **Method of Delivery:** Arranged

**Course Description:** This course is designed to provide the student with an understanding of security concepts and practices in general and those specific to database security in a highly detailed implementation. The student will be shown how to develop database applications, embedding from simple to sophisticated security and auditing models.

**Prerequisite:** CIS 328 Database Management I: Disaster Recovery

**Text(s) & Manual(s):** Database Security and Auditing: Protecting Data Integrity and Accessibility

**Author(s):** Afyouni, Hassan

**Publisher:** Course Technology, ISBN 10-0619215593; ISBN 13-978-0619215593

**Materials needed for this course:** Office 2013, Office

**Topics:**

- Security Architecture
- Operating System Security Fundamentals
- Administration of Users
- Profiles, Password Policies, Privileges, and Roles
- Database Applications Security Models
- Virtual Private Databases
- Database Auditing Models
- Application and Data Auditing
- Auditing Database Activities
- Security and Auditing Project Cases

**Learning Objectives:**

Upon completion of this course, the student will be able to:

1. Audit a business database for security vulnerabilities
2. Analyze the results of a security audit
3. Create a security plan to address vulnerabilities
4. Implement a security plan to secure a database or multiple databases

**Midstate Grading scale:**

90 – 100% A

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80 – 89% B  
70 – 79% C  
60 – 69% D  
0 – 59% F

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In courses containing writing assignments, the College promotes the use of an electronic resource which compares the student's writing against previously submitted papers, journals, periodicals, books, and web pages. Students and instructors can use this service to reduce the incidence of plagiarism. This electronic resource has been found to conform to legal requirements for fair use and student confidentiality. It is able to provide a report to the student indicating the parts of the assignment that match.

**Student Success:**

The Office of Student Success is available to students seeking tutoring for individual classes or who need assistance with writing assignments. Information is also available on test taking techniques, how to take notes, developing good study skills, etc. Contact Student Success in Room 217 (in person); (309) 692-4092, extension 2170 (phone); [studentsuccess@midstate.edu](mailto:studentsuccess@midstate.edu) (email).

**Instructor:** Greg Ballard

**Room:** 122

**Midstate email:** [gaballard@midstate.edu](mailto:gaballard@midstate.edu)

**Phone:** (800) 251-4299 x1220

**Office Hours:** By Appointment (student arranges)

**Course Requirements**

- To be considered in attendance for an eLearning course, the student must participate each week by submitting substantial, gradable work.
- **Time management** is critical in business world, it is critical in our class as well. Please make sure that you meet all deadlines specified in the outline. All assignment (projects, trainings and exams) should be submitted on time.
- The online educational venue offers students the flexibility to access the course at any time. This course, however, has **very specific, time-restricted discussion forums, assignment and tests due dates**.
- Plan to devote as much time if not more to an eLearning course as you would to a traditional class (eLearning classes, in fact, take more time).
- In a completely online course for 4 credit hours, students should plan to spend **about 8 hours each week:** 4 hours (as in regular classroom) learning the material AND 4 hours doing

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the homework. Students should plan ahead, schedule time wisely and *never* wait until the “eleventh hour” to start and submit the assignments.

- Class participation, by posting in the Week Discussion Forum and completing Weekly Summary per week is worth 10% of the grade (please remember that it can make a difference between “A” and “B”). Both the Discussion Forum and Weekly Summary are Required Posts - you must post there first before being allowed to view others messages. The Discussion Forum and Weekly Summary expire at the close of each eLearning Week at 8 am on Monday.
- Each week your assignments are worth 100 points. To receive full credit, assignments must be posted by due date. Time extensions on homework are considered on a case-by-case basis, and requests following due date will not be granted. Late work will be docked 20% for each week it is late. If you're experiencing problems and want an extension on due date, request needs to be made before work is due to be considered. **NO LATE HOMEWORK WILL BE ACCEPTED AFTER WEEK TEN.** Exams must be taken during the Week they are assigned.

**Grading Policy**

The Discussion Forum and Weekly Summary message areas expire at the close of each eLearning Week on Monday at 8:00 a.m. Discussion posts for participation and the Weekly Summary can only be made during the specific Week of the course schedule - **NO LATE DISCUSSION POSTS NOR LATE WEEKLY SUMMARIES WILL BE ACCEPTED. WEEKLY SUMMARIES POSTED TO A FORUM OTHER THAN THE WEEKLY SUMMARY FORUM WILL NOT BE COUNTED.**

Each week your assignments are worth 100 points. To receive full credit, assignments must be posted by due date. Time extensions on homework are considered on a case-by-case basis, and requests following due date will not be granted. 80% is the maximum grade late homework can receive. Late work will be docked 20% for each week it is late. If you're experiencing problems and want an extension on due date, request needs to be made before work is due to be considered.

Attach ALL files together in one post each week and put them into the ASSIGNMENTS DROPBOX. **Each file should be clearly named and have student's name.**

**Good writing skills** (proper spelling, punctuation, usage of meaningful sentences and paragraphs) should be demonstrated in each assignment and class postings.

**Examination Information:** There will be Midterm Exam and Final Exam.

**Instructor’s Grading Scale:**

40%	Exams (midterm and final)
10%	Discussion Questions

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40%	Written Communication Assignments
10%	Summaries

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**CIS 338 Schedule**

<b>Class</b>	<b>Topics</b>	<b>Learning Objectives</b>	<b>Assignments/Exams</b>
<b>Week 1</b>	Introduction and Overview Read Chapter 1-Security Architecture	3, 4	Homework, Discussion, Summary
<b>Week 2</b>	Read Chapter 2-Operating System Security Fundamentals	3, 4	Homework, Discussion, Summary
<b>Week 3</b>	Read Chapter 3-Administration of Users	3, 4	Homework, Discussion, Summary
<b>Week 4</b>	Read Chapter 4-Profiles, Password Policies, Privileges, and Roles	3, 4	Homework, Discussion, Summary
<b>Week 5</b>	Read Chapter 5-Database Application Security	3, 4	Homework, Discussion, Summary
<b>Week 6</b>	<b>Mid-Term (Over CHS 1-5)</b>	3, 4	<b>Mid-Term Exam</b>
<b>Week 7</b>	Models and Chapter 6-Virtual Private Databases	1, 2	Homework, Discussion, Summary
<b>Week 8</b>	Read Chapter 7-Database Auditing Models	1, 2	Homework, Discussion, Summary
<b>Week 9</b>	Read Chapter 8-Application Data Auditing	1, 2	Homework, Discussion, Summary
<b>Week 10</b>	Read Chapter 9-Auditing Database Activities	1, 2	Homework, Discussion, Summary
<b>Week 11</b>	Read Chapter 10-Security and Auditing Project Cases	1, 2, 3, 4	Homework, Discussion, Summary
<b>Week 12</b>	<b>FINAL EXAM CHS 6-10</b>	<b>1, 2</b>	<b>FINAL EXAM</b>

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**Week 1:**

**Objectives**

Upon completion of this week the student will be able to:

- Define security
- Describe an information system and its components
- Define database management system functionalities
- Outline the concept of information security
- Identify the major components of information security architecture
- Define database security
- List types of information assets and their values
- Describe security methods

**Assignments**

1. Reading Assignment
  - a. Read Chapter 1
2. Written Assignments
  - a. Post to Discussion Forum

**Rubric for Discussion Forum Posts:**

- Original post that pertains to the discussion topic. (30%)
- Read and reply to at least one message posted by other users.(30%)
- Correct spelling, grammar, sentence structure. (20%)
- On time. (2 pts)
  - b. Submit a weekly summary to the Weekly Summary Forum

**Rubric for Summary Forum Posts:**

- Paragraph 1 (30%)
- Paragraph 2 (30%)
- Correct spelling, grammar and sentence structure (20%)
- Completed by deadline (20%)

**Week 2:**

**Objectives**

Upon completion of this week the student will be able to:

- Explain the functions of an operating system
- Describe the operating system security environment from a database perspective
- List the components of an operating system security environment
- Explain the differences between authentication methods
- Outline useful user administration best practices
- List the criteria of strong password policies

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- Describe operating system vulnerabilities
- Describe security risks posed by e-mail services

**Assignments**

1. Reading Assignment
  - a. Read Chapter 2
2. Written Assignments
3. Discussion & Summary Forums

**Week 3:**

**Objectives**

Upon completion of this week, the student will be able to:

- Explain the importance of administration documentation
- Outline the concept of operating system authentication
- Create users and logins using both Oracle10g and SQL Server
- Remove a user from Oracle10g and SQL servers
- Modify an existing user using both Oracle10g and SQL servers
- List all default users on Oracle10g and SQL servers
- Explain the concept of a remote user
- List the risks of database links
- List the security risks of linked servers
- List the security risks of remote servers
- Describe best practices for user administration

**Assignments**

1. Required Reading: Chapter 3
2. Written Assignments
3. Discussion & Summary Forums

**Week 4:**

**Objectives**

Upon completion of this week, the student will be able to

- Define and use a profile
- Design and implement password policies
- Implement password policies in Oracle and SQL Server
- Grant and revoke user privileges
- Create, assign, and revoke user roles
- List best practices for securing a network environment

**Assignments**

1. Reading Assignment: Read Chapter 4
2. Written Assignments
3. Discussion & Summary Forums



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**Week 5:**

**Objectives**

Upon completion of this week, the student will be able to

- Describe the different types of users in a database environment and the distinct purpose of each
- Identify and explain the concepts of five security models
- List the most commonly used application types
- Implement the most common application security models
- Understand the use of data encryption within database applications

**Assignments**

1. Reading Assignment
  - a. Read Chapter 5
2. Written Assignments
3. Discussion & Summary Forums

**Week 6:**

- Complete Midterm Exam (CHS 1-5)

**Week 7:**

**Objectives**

Upon completion of this week, the student will be able to

- Define the term “virtual private database” and explain its importance
- Implement a virtual private database by using the VIEW database object
- Implement a virtual private database by using Oracle’s application context
- Implement the Oracle virtual private database feature
- Use a data dictionary to view an Oracle virtual private database
- Use Policy Manager to view an Oracle virtual private database
- Implement row-level and column-level security

**Assignments**

1. Reading Assignment
  - a. Read Chapter 6
2. Written Assignments
3. Discussion & Summary Forums

**Week 8:**

**Objectives**

Upon completion of this week, the student will be able to

Gain an overview of auditing fundamentals

- Understand the database auditing environment
- Create a flowchart of the auditing process
- List the basic objectives of an audit
- Define the differences between auditing classifications and types
- List the benefits and side effects of an audit
- Create your own auditing models

**Assignments**

1. Reading Assignment
  - a. Read Chapter 7
2. Written Assignments
3. Discussion & Summary Forums

**Week 9:**

**Objectives**

Upon completion of this week, the student will be able to

- Understand the difference between the auditing architecture of DML Action Auditing Architecture and DML changes
- Create and implement Oracle triggers
- Create and implement SQL Server triggers
- Define and implement Oracle fine-grained auditing
- Create a DML statement audit trail for Oracle and SQL Server

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- Generate a data manipulation history
- Implement a DML statement auditing using a repository
- Understand the importance and the implementation of application errors auditing in Oracle
- Implement Oracle PL/SQL procedure authorization

**Assignments**

1. Reading Assignment
  - a. Read Chapter 8
2. Written Assignments
3. Discussion & Summary Forums

**Week 10:**

**Objectives**

Upon completion of this week, the student will be able to

Use Oracle database activities

- Learn how to create DLL triggers with Oracle
- Audit database activities using Oracle
- Audit server activities with Microsoft SQL Server 2000
- Audit database activities using Microsoft SQL Profiler
- Use SQL Server for security auditing

**Assignments**

1. Reading Assignment
  - a. Read Chapter 9
2. Written Assignments
3. Discussion & Summary Forums

**Week 11:**

**Objectives**

Upon completion of this week, the student will be able to: Design and implement security and auditing solutions for many common business situations

**Assignments**

1. Reading Assignment
  - a. Read Chapter 10
2. Written Assignments
3. Discussion & Summary Forums

**Week 12:**

- Complete Final Exam (CHS 6-10)
- Complete Discussion Forum