I. **OVERVIEW**

The following information will appear in the 2010 - 2011 catalog

**CMPSC 220 Database Server Administration** 3 Units

*Formerly listed as: CMPSC - 220: SQL Server Administration*

*Recommended for Success: Before enrolling in this course, students are strongly advised to have prior experience working with computer server systems or first complete CMPSC264 - Windows Server OS course.*

Provides students with the knowledge and skills required to install, configure, administer, and troubleshoot various SQL Server client/server database management systems.

Three maximum completions.

Field trips are not required. (A-F or P/NP - Student choice) Lecture /Lab

Transfer: (CSU)

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

   a. What is Microsoft SQL Serve
      i. SQL Server architecture
      ii. SQL Server security
      iii. SQL Server databases

   b. Hardware and software requirements
      i. SQL Server installation options
      ii. Running the SQL Server setup program

   c. Managing application security
      i. Implementing an authentication mode
      ii. Assigning logins to users and roles
      iii. Assigning permissions to users and roles

   d. Managing database files
      i. Creating databases
      ii. Modifying databases
e. Backing up databases
   i. When to back up databases
   ii. Performing backups
   iii. Types of backup methods
   iv. Planning a backup strategy

f. Restoring databases
   i. SQL Server recovery process
   ii. Preparing to restore a database
   iii. Restoring backups
   iv. Restoring databases from different backup types
   v. Using a standby SQL Server

g. Automating routine maintenance tasks
   i. Creating operators and jobs
   ii. Creating alerts

h. Data
   i. Tools for transferring data in SQL Server
   ii. Introduction to data transformation services (DTS)

i. Monitoring and Maintaining SQL Server
   i. Tools for monitoring and measuring performance of SQL Server
   ii. Creating a maintenance plan for SQL Server

j. Replication
   i. SQL Server replication agents
   ii. SQL Server replication types
   iii. Publishing
   iv. Subscribing

2. Required Lab Content:

   In lab, students perform the functions listed in the lecture content section. Assignments are given that require application of the content.

   a. What is a SQL Server?
i. SQL Server architecture
ii. SQL Server security
iii. SQL Server databases

b. Hardware and software requirements
   i. SQL Server installation options
   ii. Running the SQL Server setup program

c. Managing application security
   i. Implementing an authentication mode
   ii. Assigning logins to users and roles
   iii. Assigning permissions to users and roles

d. Managing database files
   i. Creating databases
   ii. Modifying databases

e. Backing up databases
   i. When to back up databases
   ii. Performing backups
   iii. Types of backup methods
   iv. Planning a backup strategy

f. Restoring databases
   i. SQL Server recovery process
   ii. Preparing to restore a database
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g. Automating routine maintenance tasks
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   i. Tools for transferring data in SQL Server
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iii. Monitoring and Maintaining SQL Server

iv. Tools for monitoring and measuring performance of SQL Server

v. Creating a maintenance plan for SQL Server

i. Replication

   i. SQL Server replication agents

   ii. SQL Server replication types

   iii. Publishing

   iv. Subscribing

B. **ENROLLMENT RESTRICTIONS**

1. **Advisories**

   Before enrolling in this course, students are strongly advised to have prior experience working with computer server systems or first complete CMPSC264 - Windows Server OS course.

2. **Requisite Skills**

   *Before entering the course, the student will be able to:*

   a. Explain the components of a microcomputer system.
   
   b. Describe the functional difference between systems software and applications software.
   
   c. Demonstrate how the Windows operating system is used to manage the computer system.
   
   d. Identify the differences between server and desktop software.
   
   e. Evaluate server hardware/software requirements for a given application.
   
   f. Troubleshoot and tune server operation functions
   
   g. Plan and implement system security.

C. **HOURS AND UNITS**


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<thead>
<tr>
<th>INST METHOD</th>
<th>TERM HOURS</th>
<th>UNITS</th>
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<tbody>
<tr>
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<tr>
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<tr>
<td>Disc</td>
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<td>0</td>
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</tbody>
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D. **METHODS OF INSTRUCTION (TYPICAL)**

*Instructors of the course might conduct the course using the following method:*

1. Formal lectures by a certified instructor and/or internet assisted presentation

2. Assigned reading and discussion of required text
3. Assigned reading of supplemental reference materials
4. Implementation of computer laboratory projects
5. Each student will demonstrate competence in administering SQL by carefully analyzing and executing a series of detailed lab instructions for completion of lab projects.
6. Each student will analyze and design solutions for installing, configuring, administering and troubleshooting.

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS

Time spent on coursework in addition to hours of instruction (lecture hours)

On a weekly basis students will:

a. Read assigned textbook content
b. Read online assigned or research content
c. Complete computer exercises

Periodically students will:

a. Complete hands-on computer lab assignments
b. Research pertinent topics and report on findings
c. Prepare to take quizzes and tests to evaluate retention
d. Execute group activities designed to build teamwork skills

2. EVIDENCE OF CRITICAL THINKING

Assignments require the appropriate level of critical thinking

Assignment Example:

In order to provide reliable high performance access to database data the design of the disk storage subsystem requires special attention. The use of RAID (Redundant Array of Inexpensive Disks) provides administrators with very reliable and robust storage. Research the use of RAID and write a 2 page report explaining the different levels available, their use and features. Also research the typical cost of an example of SCSI, SATA and Serial Attached SCSI systems.

Exam Question Examples:

1. SCSI level ___ provides redundant data stripes and parity.
   a. 1
   b. 2
   c. 5
   d. 10

2. ___ RAID should only be used in cases where the reliability is not as important and cost is.
   a. hardware
   b. parity
   c. SCSI
   d. software

F. TEXTS AND OTHER READINGS (TYPICAL)
III. DESIRED LEARNING

A. COURSE GOAL
   As a result of satisfactory completion of this course, the student should be prepared to:

   articulate SQL Server architecture; construct files and databases; create and configure login security;
   conceive and implement database permissions; and measure and monitor SQL Server performance.

B. STUDENT LEARNING GOALS
   Mastery of the following learning goals will enable the student to achieve the overall course goal.

1. Required Learning Goals
   Upon satisfactory completion of this course, the student will be able to:

   a. Describe SQL Server architecture.
   b. Plan for a SQL Server installation.
   c. Describe and practice installing SQL Server and configure SQL Server.
   d. Describe and practice installing SQL Server and configure SQL Server.
   e. Choose a login security method.
   f. Set up and configure login security.
   g. Plan and implement database permissions.
   h. Plan and execute the back up and restoration of databases.
   i. Create jobs and alerts to automate administrative tasks using SQL Server Agent.
   j. Create custom administrative tools.
   k. Examine the DTS(data transformation services) used to transfer and migrate data into databases.
   l. Measure and monitor SQL Server performance.
   m. Demonstrate the replication of data from one SQL Server to another.

2. Lab Learning Goals
   Upon satisfactory completion of the lab portion of this course, the student will be able to:

   a. Describe SQL Server architecture.
   b. Plan for a SQL Server installation.
   c. Describe and practice installing SQL Server and configure SQL Server.
   d. Describe and practice installing SQL Server and configure SQL Server.
   e. Choose a login security method.
   f. Set up and configure login security.
   g. Plan and implement database permissions.
h. Plan and execute the back up and restoration of databases.

i. Create jobs and alerts to automate administrative tasks using SQL Server Agent.

j. Create custom administrative tools.

k. Examine the DTS (data transformation services) used to transfer and migrate data into databases.

l. Measure and monitor SQL Server performance.

m. Demonstrate the replication of data from one SQL Server to another.

n. SECOND COMPLETION:

o. demonstrate updated skills reflecting current industry standards as software tools, interface and functions evolve in new versions.

p. THIRD COMPLETION:

q. demonstrate updated skills reflecting current industry standards as software tools, interface and functions evolve in new versions.

IV. METHODS OF ASSESSMENT (TYPICAL)

A. FORMATIVE ASSESSMENT

1. Assignments

2. Exams/Quizzes

3. Projects/Labs

B. SUMMATIVE ASSESSMENT

1. Assignments

2. Exams/Quizzes

3. Projects/Labs