Course Title - Administering SQL Server
Course Prefix and Number – ITNW 2352
Department – Computer Science Division – Tech & Bus
Course Type: (check one)
☐ Academic General Education Course (from ACGM – but not in WCJC Core)
☐ Academic WCJC Core Course
☒ WECM course (This course is a Special Topics or Unique Needs Course: Y ☒ or N ☐)

Semester Credit Hours # : Lecture hours# : Lab/other hours # 3:2:2

Equated Pay hours for course - 3

Course Catalog Description – Topics include installation, configuration, administration, and troubleshooting SQL servers using Microsoft SQL Server. Students will describe SQL Server architecture, plan for an installation, install and configure SQL server, manage files and databases, configure login security, implement permissions, backup and restore databases, and monitor performance. Prerequisite: ITNW 2305 [Offered Spring semester] Type: Tech

Prerequisites/Corequisites - ITNW 2305

Approvals – the contents of this document have been reviewed and are found to be accurate.

Prepared by Stephanie Dees
Signature
Date 11/25/2009

Department Head Stephanie Dees
Signature
Date 11/25/2009

Division Chair Stephanie Dees
Signature
Date 11/25/2009

Vice President of Instruction or Dean of Vocational Instruction
Signature
Date 12-1-09
I. Topical Outline – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non lecture instruction):

- Installing Microsoft SQL Server 2005.
- Meeting the Prerequisites.
- Preparing to Install.
- Choosing Default Instances or Named Instances.
- Choosing Service Accounts.
- Selecting an Authentication Mode.
- Choosing a Collation Setting.
- Upgrading from a Previous Version.
- Installing SQL Server 2005.
- Installing a Second Instance.
- Troubleshooting the Installation.

Creating and Configuring Databases.

- Planning Your Database.
- Introducing Database Files.
- Introducing Filegroups.
- Deciding on Database File Placement.
- Introducing RAID-0.
- Introducing RAID-1.
- Introducing RAID-5.
- Introducing RAID-10.
- Creating Data Storage Structures.
- Introducing Extents.
- Introducing Pages.
- Estimating Storage Requirements.
- Estimating Table Storage Requirements.
- Estimating Index Storage Requirements.
- Creating and Configuring Databases.
- Creating a Database.
- Gathering Information about Your Database.
- Setting Database Options.

Working with Tables and Views.

- Planning Tables.
- Introducing Built-in Datatypes.
- Introducing Computed Columns.
- Creating Tables.
- Restricting the Data.
- Introducing Constraints.
- Partitioning Tables.
- Understanding Views.
- Modifying Data through a View.
- Working with Indexed Views.

Performing Indexing and Full-Text Searching.

- Understanding Index Architecture.
- Understanding Heaps.
- Understanding Clustered Indexes.
- Understanding Nonclustered Indexes.
- Creating Indexes.
- Using Primary Keys.
- Using Full-Text Searching.
Introducing More Database Objects.
- Introducing Stored Procedures.
- Understanding the Types of Stored Procedures.
- Creating Stored Procedures.
- Recompiling Stored Procedures.
- Introducing Triggers.
- Understanding the Types of Triggers.
- Understanding DML Triggers.
- Understanding DDL Triggers.
- Understanding Trigger Recursion and Nesting.
- Understanding Disabling Triggers.
- Understanding Event Notifications.
- Introducing Functions.
- Understanding the Types of Functions.
- Using Scalar Functions.
- Introducing Table-Valued Functions.
- Introducing Built-in Functions.
- Using CLR Functions.
- Introducing Deterministic and Nondeterministic Functions.
- Creating User-Defined Types.
- Creating T-SQL User-Defined Types.
- Creating CLR User-Defined Types.
- Getting More CLR Functionality.

- Understanding Security Modes
- Using Windows Authentication Mode
- Using Mixed Mode
- Setting the Authentication Mode
- Understanding SQL Server Logins
- Using Standard Logins
- Using Windows Logins
- Understanding the Items Common to All Logins
- Understanding Fixed Server Roles
- Creating Database User Accounts
- Understanding Permissions
- Applying Statement Permissions
- Applying Object Permissions
- Understanding Database Roles
- Using Fixed Database Roles
- Using Custom Database Roles
- Using Application Roles
- Understanding Permission States
- Granting a Permission
- Revoking a Permission
- Denying a Permission
- Introducing Ownership Chains
- Introducing Linked Server Security
- Introducing Encryption
- Creating a Security Plan.

Working with Relational Data.
- Understanding and Using Transactions
- Executing Implicit and Explicit Transactions
- Committing and Rolling Back
- Executing Distributed Transactions
- Populating Tables
- Importing Data Using Bulk Insert
- Importing Data Using the bcp Utility
- Copying Data Using SSIS
- Bulk Inserting XML Data
• Supporting the Bulk-Logged Recovery Model
• Supporting Different Collation Types and Orders
• When Querying Data
• Formatting and Converting Datatypes
• Casting and Converting
• Understanding Datatype Precedence
• Understanding Collations
• Introducing Error Handling
• Using RAISERROR.
• Using @@ERROR
• Using Error Messages
• Using TRY…CATCH Blocks.

Working with XML Data.
• Understanding XML Data
• Using the xml Datatype
• Using Untyped XML
• Using Typed XML
• Working with XML Schema
• Querying XML Data
• Using the query Method.
• Using the value Method.
• Using the exist Method.
• Using the modify Method.
• Understanding Collations
• Using the nodes Method.
• Creating XML Indexes.

Working with Service Broker and HTTP.
• Understanding the SQL Server Service Broker Architecture.
• Working with Service Broker.
• Creating a Message Type.
• Creating a Queue.
• Creating a Contract.
• Creating a Service.
• Creating a Route.
• Using Service Broker.
• Sending Messages.
• Receiving Messages.
• Automating the Queue Processing.
• Introducing HTTP Endpoints.
• Configuring HTTP Endpoints.
• Securing HTTP Endpoints.

Maintaining and Automating SQL Server.
• Maintaining Indexes.
• Understanding sys.DM_DB_INDEX_PHYSICAL_STATS.
• Reorganizing and Rebuilding Indexes.
• Maintaining Statistics.
• Maintaining Databases.
• Understanding DBCC CHECKDB.
• Shrinking Files.
• Understanding Automation Basics.
• Configuring Database Mail.
• Creating Operators.
• Creating Jobs.
• Creating Alerts.
• Creating Event Alerts Based on Standard Errors.
• Creating Event Alerts Based on Custom Errors.
• Creating Performance Alerts.
• Creating WMI Alerts.
• Using the Maintenance Plan Wizard.
• Copying Databases.
Performing Backups and Restores.
• Backing Up Your Data.
• Understanding How Backups Work.
• Creating a Backup Device.
• Performing Full Backups.
• Performing Differential Backups.
• Performing Transaction Log Backups.
• Performing Filegroup Backups.
• Backing Up to Multiple Devices.
• Restoring Databases.
• Performing Standard Restores.
• Performing Point-in-Time Restores.
• Performing Piecemeal Restores.
• Devising a Backup Strategy.
• Planning for Full Backups Only.
• Planning for Full with Differential Backups.
• Planning for Full with Transaction Log Backups.
• Planning for Full, Differential, and Transaction Log Backups.
• Planning for Filegroup Backups.
Achieving High Availability through Replication.
• Introducing Replication.
• Introducing the Publisher/Subscriber Metaphor.
• Introducing Articles.
• Introducing Publications.
• Understanding Replication Factors and Distribution Types.
• Using Distributed Transactions.
• Using Transactional Replication.
• Using Transactional Replication with Immediate Updating Subscribers.
• Using Snapshot Replication.
• Using Snapshot Replication with Immediate Updating Subscribers.
• Using Merge Replication.
• Using Queued Updating.
• Understanding Replication Internals.
• Understanding Merge Replication.
• Understanding Snapshot Replication.
• Understanding Transactional Replication.
• Considering Publication Issues.
• Considering Distributor Issues.
• Introducing Replication Models.
• Introducing Central Publisher/Central Distributor.
• Introducing Remote Distribution.
• Introducing Central Subscriber/Multiple Publishers.
• Introducing Multiple Publishers/Multiple Subscribers.
• Replicating over the Internet and to Heterogeneous Database Servers.
• Using Heterogeneous Replication.
• Using Internet Replication.
• Installing and Using Replication.
• Configuring SQL Server for Replication.
• Installing a Distribution Server.
• Adding a Publication.
• Creating a Subscription.
• Testing Replication.
• Managing Replication.
• Considering Administrative Issues.
• Considering Replication Backup Issues.
• Using the Replication Monitor.
• Working with Replication Scripts.
• Enhancing Replication Performance.
Introducing More High-Availability Methods.
II. Course Learning Outcomes

<table>
<thead>
<tr>
<th>Course Learning Outcome</th>
<th>Method of Assessment</th>
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<tbody>
<tr>
<td>Plan, install, configure, and administer a Relational Database Management System (RDBMS)</td>
<td>Assessed in ITNW 2335 – Group Capstone Project; At least 75% of students will score C or higher, grading based on rubric</td>
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III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.


IV. Suggested Course Maximum - 20

V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.

- Microsoft Windows Server operating system software licensed for each student (evaluation version is appropriate)
- Microsoft SQL Server software licensed for each student (evaluation version is appropriate)
- Computer (including monitors, mice, keyboards) not in use by any other class for each student
- Printer
- Network device (hub or switch) and cables
VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course

Assignments ....................................................................................................................... 40%
Class Attendance and Participation .................................................................................... 10%
Tests ........................................................................................................................................ 40%
Final Exam ............................................................................................................................ 10%

100%

VII. Curriculum Checklist

☐ - Academic General Education Course (from ACGM – but not in WCJC Core)
   No additional documentation needed

☐ - Academic WCJC Core Course
   Attach the Core Curriculum Checklist, including the following:
   • Basic Intellectual Competencies
   • Perspectives
   • Exemplary Educational Objectives

☒ - WECM Courses
   • If needed, revise the Program SCANS Matrix & Competencies Checklist.