


<b>Course Outline</b>	
COMP6119 Database Administration (2/2)	
<b>Effective Date</b> 01 September 2017	<b>Study Program</b> Computer Science <b>Revision 1</b>

**1. Course Description**

This course consists of database administration skills in particularly using microsoft SQL Server. Its gives student knowledge and skill in covering installation, configuration and tuning a database, administering servers and server groups, managing and optimizing schema, tables, indexes, and views, creating logins, configuring permissions, assigning roles and performing other essential security tasks, backup and recovery strategies, automation and maintenance.

**2. Graduate Competency**

Each course in the study program contributes to the graduate competencies that are divided into employability and entrepreneurial skills and study program specific outcomes, in which students need to have demonstrated by the time they complete their course.

BINUS University employability and entrepreneurial skills consist of planning and organizing, problem solving and decision making, self management, team work, communication, and initiative and enterprise.

**2.1. Employability and Entrepreneurial Skills**

Aspect	Key Behaviour

**2.2. Study Program Specific Outcomes**

Study Program Specific Outcomes
Able to classify problems and to apply design and development principles for specific problems
Able to construct a solution by applying current technologies
Able to depict trend technologies in the future
Able to classify criteria and specifications appropriate to specific problems, plan strategies for their solution and construct software system development

**3. Topics**

- SQL Server 2014 Architecture
- Managing And Troubleshooting The Database Engine
- Securing The Database Instance
- Configuring The Server For Optimal Performance
- Optimizing SQL Server 2014
- Monitoring SQL Server
- Performance Tuning
- Indexing Your Database
- Replication
- Clustering SQL Server 2014
- Backup and Recovery
- Database Mirroring
- SQL Database Administration and Configuration

- Transaction Management-1
- Maintenance & Backup and Recovery
- Automating SQL Server
- Service Broker and Security
- Transaction Management-2
- Index, Replication, Services Administration and Performance Tuning
- Optimizing Server
- Query Processing-1
- Query Processing-2
- Query Processing-3
- Reporting Service Administration

#### 4. Learning Outcomes

On successful completion of this course, student will be able to:

- LO 1: Explain the strategy to manage and monitor the Database Server
- LO 2: Apply SQL Server Features
- LO 3: Apply strategies for Performance Tuning
- LO 4: Construct a plan for Backup and Recovery

#### 5. Teaching And Learning Strategies

In this course, the lecturers might deploy several teaching learning strategies, including Demonstration, Case Study, and Lecture.

#### 6. Textbooks and Other Resources

##### 6.1 Textbooks

1. Adam Jorgensen, Bradley Ball, Steven Wort, Ross LoForte, Brian Knight. (2014). ***Professional Microsoft SQL Server 2014 Administration***. 01. Wrox Press. ISBN: 9781118859131.

The book in the first list is a must to have for each student.

##### 6.2 Other Resources

1. <http://mva.microsoft.com>
2. <http://msdn.microsoft.com/en-us/library/ms187048.aspx>
3. <http://msdn.microsoft.com/id-id/library/ms174212.aspx>
4. <http://msdn.microsoft.com/en-us/library/ms365315.aspx>
5. [http://technet.microsoft.com/en-us/library/jj835095\(v=sql.110\).aspx](http://technet.microsoft.com/en-us/library/jj835095(v=sql.110).aspx)
6. <http://msdn.microsoft.com/en-us/library/ff648664.aspx>
7. <http://searchsqlserver.techtarget.com/definition/replication>
8. <http://www.mssqltips.com/sql-server-tip-category/60/database-administration/>
9. [http://msdn.microsoft.com/en-us/library/ee377023\(v=bts.10\).aspx](http://msdn.microsoft.com/en-us/library/ee377023(v=bts.10).aspx)
10. <http://msdn.microsoft.com/en-us/library/dn673537.aspx>
11. <http://blogs.technet.microsoft.com/dataplatforminsider/2013/07/22/architectural-overview-of-sql-server-2014s-in-memory-oltp-technology/>
12. <http://www.databasejournal.com/features/mssql/backup-and-restore-strategies-in-sql-server-part-1.html>
13. <http://sqlmag.com/sql-server-2008/top-10-sql-server-performance-tuning-tips>
14. <http://msdn.microsoft.com/en-us/library/ms189925.aspx>
15. <http://msdn.microsoft.com/en-us/library/ms151198.aspx>
16. <http://www.sqlshack.com/sql-server-2014-install-clustered-instance-step-step-13/>
17. [http://technet.microsoft.com/en-us/library/ms172984\(v=sql.110\).aspx](http://technet.microsoft.com/en-us/library/ms172984(v=sql.110).aspx)
18. <http://blogs.technet.microsoft.com/dataplatforminsider/2014/02/05/database-backup-with-memory-optimized-tables/>
19. [http://technet.microsoft.com/en-us/library/bb510540\(v=sql.105\).aspx](http://technet.microsoft.com/en-us/library/bb510540(v=sql.105).aspx)
20. <http://www.mssqltips.com/sql-server-tip-category/104/reporting-services-administration/>
21. <http://stackoverflow.com/questions/1108/how-does-database-indexing-work>
22. <http://www.mssqltips.com/sql-server-tip-category/64/database-mirroring/>
23. <http://msdn.microsoft.com/en-us/library/ms365309.aspx>
24. <http://www.tutorialspoint.com/sql/sql-drop-table.htm>

7. Schedule

Theory

Session/ Mode	Related LO	Topics	References
1 F2F	LO 1	SQL Server 2014 Architecture - SQL Server 2014 Ecosystem - New Important Features In 2014 - SQL Server Architecture - Editions Of SQL Server	- SQL Server 2014 Architecture - Professional Microsoft SQL Server 2014 Administrasion, Chapter 1 - Architectural Overview of SQL Server 2014's In-Memory OLTP Technology, <a href="http://blogs.technet.microsoft.com/dataplatforminsider/2013/07/22/architectural-overview-of-sql-server-2014s-in-memory-oltp-technology/">http://blogs.technet.microsoft.com/dataplatforminsider/2013/07/22/architectural-overview-of-sql-server-2014s-in-memory-oltp-technology/</a>
2 F2F	LO 1	Managing And Troubleshooting The Database Engine - Configuration And Administration - Troubleshooting Tools - SQL Server Management Studio - Multiserver Management	- Managing And Troubleshooting The Database Engine - Professional Microsoft SQL Server 2014 Administrasion, Chapter 4 - Manage the Database Engine Services, <a href="http://msdn.microsoft.com/en-us/library/ms189925.aspx">http://msdn.microsoft.com/en-us/library/ms189925.aspx</a> - Troubleshooting (Database Engine, <a href="http://technet.microsoft.com/en-us/library/bb510540(v=sql.105).aspx">http://technet.microsoft.com/en-us/library/bb510540(v=sql.105).aspx</a>
3 GSLC	LO 1 LO 2	Securing The Database Instance - Authentication Types - Logins And Users - Authorizing Securables - Row-Level Security	- Securing The Database Instance - Professional Microsoft SQL Server 2014 Administrasion, Chapter 8 - Securing Your Database Server, <a href="http://msdn.microsoft.com/en-us/library/ff648664.aspx">http://msdn.microsoft.com/en-us/library/ff648664.aspx</a>
4 F2F	LO 1 LO 2	Configuring The Server For Optimal Performance - What Every DBA Needs To Know About Performance - What The Developer DBA Needs To Know About Performance - What The Production DBA Needs To Know About Performance - CPU and Memory - I/O	- Configuring The Server For Optimal Performance - Professional Microsoft SQL Server 2014 Administrasion, Chapter 10 - SQL Server Configuration Manager, <a href="http://msdn.microsoft.com/id-id/library/ms174212.aspx">http://msdn.microsoft.com/id-id/library/ms174212.aspx</a>
5 F2F	LO 1 LO 2 LO 3	Optimizing SQL Server 2014 - Application Optimization - The Silent Killer: I/O Problems - SQL Server Internals and File Allocation - Table and Index Partitioning - Data Compression - Understanding SQL Server and CPUs	- Optimizing SQL Server 2014 - Professional Microsoft SQL Server 2014 Administrasion, Chapter 11 - Optimizing Your Query Plans with the SQL Server 2014 Cardinality Estimator,

		<ul style="list-style-type: none"> <li>- Memory Considerations and Enhancements</li> <li>- Resource Governor</li> </ul>	<a href="http://msdn.microsoft.com/en-us/library/dn673537.aspx">http://msdn.microsoft.com/en-us/library/dn673537.aspx</a>
6 F2F	LO 1 LO 2 LO 3 LO 4	Monitoring SQL Server <ul style="list-style-type: none"> <li>- Choosing The Appropriate Monitoring Tools</li> <li>- Performance Monitor</li> <li>- Monitoring Events</li> <li>- Monitoring With Dynamic Management Views And Functions</li> <li>- Monitoring Logs</li> <li>- SQL Server Standard Reports</li> <li>- System Center Advisor</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring SQL Server</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 12</li> <li>- Monitoring SQL Server Performance, <a href="http://msdn.microsoft.com/en-us/library/ee377023(v=bts.10).aspx">http://msdn.microsoft.com/en-us/library/ee377023(v=bts.10).aspx</a></li> </ul>
7 F2F	LO 1 LO 2 LO 3	Performance Tuning <ul style="list-style-type: none"> <li>- Overview of Query Processing</li> <li>- Identifying SQL Query Performance Tuning Issues</li> <li>- Data Access Operators In Query Plans</li> <li>- Join Operators</li> <li>- Data Modification Query Plan</li> </ul>	<ul style="list-style-type: none"> <li>- Performance Tuning</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 13</li> <li>- Top 10 SQL Server Performance Tuning Tips, <a href="http://sqlmag.com/sql-server-2008/top-10-sql-server-performance-tuning-tips">http://sqlmag.com/sql-server-2008/top-10-sql-server-performance-tuning-tips</a></li> <li>- Query Performance Tuning (SQL Server Compact),, <a href="http://technet.microsoft.com/en-us/library/ms172984(v=sql.10).aspx">http://technet.microsoft.com/en-us/library/ms172984(v=sql.10).aspx</a></li> </ul>
8 F2F	LO 2 LO 3	Indexing Your Database <ul style="list-style-type: none"> <li>- Indexing Functionality</li> <li>- Table Partition and Indexes</li> <li>- Maintenance and Tuning</li> <li>- Database Tuning Advisor</li> </ul>	<ul style="list-style-type: none"> <li>- Indexing Your Database</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 14</li> <li>- SQL Server Index Design Guide, <a href="http://technet.microsoft.com/en-us/library/jj835095(v=sql.110).aspx">http://technet.microsoft.com/en-us/library/jj835095(v=sql.110).aspx</a></li> <li>- How does database indexing work?,, <a href="http://stackoverflow.com/questions/1108/how-does-database-indexing-work">http://stackoverflow.com/questions/1108/how-does-database-indexing-work</a></li> </ul>
9 GSLC	LO 2 LO 3	Replication <ul style="list-style-type: none"> <li>- Understanding the different types of replication</li> <li>- Replication models</li> <li>- Setting up snapshot replication</li> <li>- Understanding how snapshot differs from transactional and merge replication</li> <li>- Understanding peer-to-peer replication</li> <li>- Monitoring replication</li> </ul>	<ul style="list-style-type: none"> <li>- Replication</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 15</li> <li>- What is replication?, <a href="http://searchsqlserver.techtarget.com/definition/replication">http://searchsqlserver.techtarget.com/definition/replication</a></li> <li>- SQL Server Replication, <a href="http://msdn.microsoft.com/en-us/library/ms151198.aspx">http://msdn.microsoft.com/en-us/library/ms151198.aspx</a></li> </ul>
10 F2F	LO 2 LO 3	Clustering SQL Server 2014 <ul style="list-style-type: none"> <li>- What is Clustering</li> <li>- When to use clustering</li> <li>- Clustering Option</li> <li>- Infrastructure</li> <li>- Managing and Monitoring Cluster</li> <li>- Troubleshooting Cluster Problems</li> <li>- Clustering and AlwaysOn</li> </ul>	<ul style="list-style-type: none"> <li>- Clustering SQL Server 2014</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 16</li> <li>- Always On High Availability, <a href="http://mva.microsoft.com">http://mva.microsoft.com</a></li> <li>- SQL Server 2014 – Install a clustered instance – step-by-</li> </ul>

			step, <a href="http://www.sqlshack.com/sql-server-2014-install-clustered-instance-step-step-13/">http://www.sqlshack.com/sql-server-2014-install-clustered-instance-step-step-13/</a>
11 F2F	LO 2 LO 4	Backup and Recovery - Different Types of Failure - Recovery Model - Database Backup with Memory-Optimized Tables	- Backup and Recovery - Professional Microsoft SQL Server 2014 Administrasion, Chapter 17 - Back Up and Restore of SQL Server Databases, <a href="http://msdn.microsoft.com/en-us/library/ms187048.aspx">http://msdn.microsoft.com/en-us/library/ms187048.aspx</a> - Backup and Restore Strategies in SQL Server – Part 1, <a href="http://www.databasejournal.com/features/mssql/backup-and-restore-strategies-in-sql-server-part-1.html">http://www.databasejournal.com/features/mssql/backup-and-restore-strategies-in-sql-server-part-1.html</a> - Database Backup with Memory-Optimized Table, <a href="http://blogs.technet.microsoft.com/dataplatforminsider/2014/02/05/database-backup-with-memory-optimized-tables/">http://blogs.technet.microsoft.com/dataplatforminsider/2014/02/05/database-backup-with-memory-optimized-tables/</a>
12 GSLC	LO 3 LO 4	Database Mirroring - Overview of Database Mirroring - Operating Modes Of Database Mirroring - Database Mirroring In Action - Database Mirroring And SQL Server 2014 Editions - Database Mirroring Role Change - Monitoring Using Database Mirroring Monitor - Database Mirroring And Other High-availability Solution	- Database Mirroring - Professional Microsoft SQL Server 2014 Administrasion, Chapter 19 - SQL Server Database Mirroring Tips, <a href="http://www.mssqltips.com/sql-server-tip-category/64/database-mirroring/">http://www.mssqltips.com/sql-server-tip-category/64/database-mirroring/</a>
13 F2F	LO 3 LO 4	SQL Database Administration and Configuration - Configuration Manager - Properties of SQL Server Reporting Services - Managing and Executing Reports - SQL Database Architecture - Server and Database Management - Administration tasks	- SQL Server Reporting Services Administration - Professional Microsoft SQL Server 2014 Administrasion, Chapter 22 and 24 - SQL Server Database Administration Tips, <a href="http://www.mssqltips.com/sql-server-tip-category/60/database-administration/">http://www.mssqltips.com/sql-server-tip-category/60/database-administration/</a> - SQL Server Reporting Services Administration Tips, <a href="http://www.mssqltips.com/sql-server-tip-category/104/reporting-services-administration/">http://www.mssqltips.com/sql-server-tip-category/104/reporting-services-administration/</a>

**Practicum**

Session/ Mode	Related LO	Topics	References
1 F2F	LO 1 LO 2	Transaction Management-1 - Database - Introduction to Data Structures	- Transaction Management-1 - Professional Microsoft SQL Server 2014 Administrasion,

		<ul style="list-style-type: none"> <li>- Creating Databases</li> <li>- Managing Databases</li> <li>- Create Table</li> <li>- Insert Data</li> <li>- Dropping Table</li> <li>- Dropping Database</li> </ul>	Chapter 11 <ul style="list-style-type: none"> <li>- Creating a Table, <a href="http://msdn.microsoft.com/en-us/library/ms365315.aspx">http://msdn.microsoft.com/en-us/library/ms365315.aspx</a></li> <li>- Inserting and Updating Data in a Table, <a href="http://msdn.microsoft.com/en-us/library/ms365309.aspx">http://msdn.microsoft.com/en-us/library/ms365309.aspx</a></li> <li>- SQL Tutorial, <a href="http://www.tutorialspoint.com/sql/sql-drop-table.htm">http://www.tutorialspoint.com/sql/sql-drop-table.htm</a></li> </ul>
2 F2F	LO 1 LO 2 LO 3 LO 4	Maintenance & Backup and Recovery <ul style="list-style-type: none"> <li>- Introducing Enterprise Manager Object</li> <li>- Registering New Server</li> <li>- Create Login</li> <li>- Introduction Users Database</li> <li>- Introduction Fixed Sever Roles</li> <li>- Introduction Fixed Database Roles</li> <li>- User-Defined Database Role</li> <li>- Introduction Types of Backup Methods</li> <li>- Backup &amp; Restore Database</li> <li>- Planning a Backup Strategy</li> <li>- Restoring Backups</li> <li>- Restoring Databases from Different Backup Types</li> </ul>	<ul style="list-style-type: none"> <li>- Maintenance &amp; Backup and Recovery</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 8 and Chapter 17</li> </ul>
3 F2F	LO 1 LO 2	Automating SQL Server <ul style="list-style-type: none"> <li>- Configuration Tasks</li> <li>- Automating Routine Maintenance Tasks</li> <li>- Creating jobs, Operators, and Alerts</li> <li>- Automating Multi Server Jobs</li> </ul>	<ul style="list-style-type: none"> <li>- Automating SQL Server</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 5</li> </ul>
4 F2F	LO 1 LO 2	Service Broker and Security <ul style="list-style-type: none"> <li>- Asynchronous messaging</li> <li>- Congfiguration SQL server service broker</li> <li>- Using sql server service broker</li> <li>- Grant &amp; Revoke</li> <li>- Users Administrations &amp; Roles</li> </ul>	<ul style="list-style-type: none"> <li>- Service Broker and Security</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 6</li> </ul>
5 F2F	LO 1 LO 2	Transaction Management-2 <ul style="list-style-type: none"> <li>- Introduction to transferring data</li> <li>- Tools for importing and exporting data in SQL server</li> <li>- Introduction to DTS</li> <li>- Transforming data with DTS</li> </ul>	<ul style="list-style-type: none"> <li>- Transaction Management-2</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 20</li> </ul>
6 F2F	LO 2 LO 3 LO 4	Index, Replication, Services Administration and Performance Tuning <ul style="list-style-type: none"> <li>- Introduction to Distributed Data</li> <li>- Introduction to SQL Server Replication</li> <li>- SQL Server Replication Types</li> <li>- Performance Monitoring and Tuning</li> <li>- Tools for Monitoring and Tuning Tasks</li> </ul>	<ul style="list-style-type: none"> <li>- Index, Replication, Services Administration and Performance Tuning</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 15 and Chapter 21</li> </ul>
7 F2F	LO 1 LO 2 LO 3	Optimizing Server <ul style="list-style-type: none"> <li>- Partition Function</li> <li>- Partition Schemes</li> <li>- Partition Tables</li> </ul>	<ul style="list-style-type: none"> <li>- Optimizing Server</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 11</li> </ul>
8 F2F	LO 1 LO 2 LO 3	Query Processing-1 <ul style="list-style-type: none"> <li>- Introduction to Transact SQL Code</li> <li>- Creating and Executing Stored Procedures</li> <li>- Renaming and Dropping a Store Procedure</li> <li>- Error Handling</li> <li>- Introduction to Cursor</li> <li>- Type of Cursors</li> </ul>	<ul style="list-style-type: none"> <li>- Query Processing 1</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 6 and Chapter 9</li> </ul>

		<ul style="list-style-type: none"> <li>- Combining Cursors and Store Procedures</li> <li>- Introduction to Triggers</li> <li>- Create Trigger</li> <li>- Drop Trigger</li> <li>- Exception Handling</li> </ul>	
9 F2F	LO 1 LO 2 LO 3	Query Processing-2 <ul style="list-style-type: none"> <li>- Introduction to Transact SQL Code</li> <li>- Creating and Executing Stored Procedures</li> <li>- Renaming and Dropping a Store Procedure</li> <li>- Error Handling</li> <li>- Introduction to Cursor</li> <li>- Type of Cursors</li> <li>- Combining Cursors and Store Procedures</li> <li>- Introduction to Triggers</li> <li>- Create Trigger</li> <li>- Drop Trigger</li> <li>- Exception Handling</li> </ul>	<ul style="list-style-type: none"> <li>- Query Processing 2</li> <li>- Professional Microsoft SQL Server 2014 Administrasion,</li> </ul>
10 F2F	LO 1 LO 2 LO 3	Query Processing-3 <ul style="list-style-type: none"> <li>- Introduction to Transact SQL Code</li> <li>- Creating and Executing Stored Procedures</li> <li>- Renaming and Dropping a Store Procedure</li> <li>- Error Handling</li> <li>- Introduction to Cursor</li> <li>- Type of Cursors</li> <li>- Combining Cursors and Store Procedures</li> <li>- Introduction to Triggers</li> <li>- Create Trigger</li> <li>- Drop Trigger</li> <li>- Exception Handling</li> </ul>	<ul style="list-style-type: none"> <li>- Query Processing 3</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 6 and Chapter 9</li> </ul>
11 F2F	LO 3 LO 4	Reporting Service Administration <ul style="list-style-type: none"> <li>- Introduction to Transact SQL Code</li> <li>- Introduction to SSRS</li> <li>- Setup Reporting Services server</li> <li>- Email setting</li> <li>- Managing Report Manager</li> <li>- SQL Server Reporting Service</li> </ul>	<ul style="list-style-type: none"> <li>- Reporting Service Administration</li> <li>- Professional Microsoft SQL Server 2014 Administrasion, Chapter 22</li> </ul>

**8. Evaluation**

**Theory**

Assessment Activity	Weight	Learning Outcomes			
		1	2	3	4
Assignment	20%	√	√	√	√
Mid Exam	30%	√	√	√	√
Final Exam	50%		√	√	√

**Practicum**

Assessment Activity	Weight	Learning Outcomes			
		1	2	3	4
Assigment	40%	√	√	√	√
Final Exam	60%	√	√	√	√




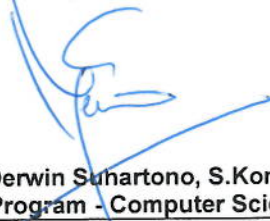
**Final Evaluation Score**

Aspects	Weight
Theory	70%
Practicum	30%

**9. A. Assessment Rubric (Study Program Specific Outcomes)**

LO	Indicators	Proficiency Level			
		Excellent (85 – 100)	Good (75 – 84)	Average (65 – 74)	Poor (<= 64)
LO 1	1.1. Explain strategy to manage the database server	Strategy to manage the database server clearly explained	Some of strategy to manage the database server explained	Strategy to manage the database server explained in small part	Strategy to manage the database server incompletely explained
	1.2. Explain monitoring process in the database server	Monitoring process in the database server clearly explained	Some of monitoring process in the database server explained	Monitoring process in the database server explained in small part	Monitoring process in the database server incompletely explained
LO 2	2.1. Apply various SQL Server Feature and configuring security for optimal performance	SQL Server feature and configuring security for optimal performance completely applied	Whole part of SQL Server feature and configuring security for optimal performance applied	SQL Server feature and configuring security for optimal performance applied	SQL Server feature and configuring security for optimal performance incompletely applied
	2.2. Apply optimizing feature in SQL Server	Optimizing feature in SQL Server completely applied	Whole part of feature in SQL Server applied	Small part of feature in SQL Server applied	Optimizing feature in SQL Server incompletely applied
LO 3	3.1. Apply performance tuning in SQL Server	Performance tuning in SQL Server completely applied	Whole part of performance tuning in SQL Server applied	Small part of performance tuning in SQL Server applied	Performance tuning in SQL Server incompletely applied
	3.2. Apply indexing, replication and clustering in SQL server	Indexing, replication and clustering in SQL server completely applied	Whole part of indexing, replication and clustering in SQL server applied	Small part of indexing, replication and clustering in SQL server applied	Indexing, replication and clustering in SQL server incompletely applied
LO 4	4.1. Construct Backup and recovery in SQL Server	Backup and recovery in SQL Server completely constructed	Whole part of backup and recovery in SQL Server constructed	Small part of backup and recovery in SQL Server constructed	Backup and recovery in SQL Server incompletely constructed
	4.2. Construct SQL Database Administration and Configuration	SQL Database Administration and Configuration completely constructed	Whole part of SQL Database Administration and Configuration constructed	Small part of SQL Database Administration and Configuration constructed	SQL Database Administration and Configuration incompletely constructed



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<p>Approved by</p>  <p><b>D5878 - Dewi Suryani, S.Kom., M.Eng. Concentration Content Coordinator</b></p>	<p>Acknowledged by</p>  <p><b>D3690 - Derwin Suhartono, S.Kom., M.T.I. Head of Program - Computer Science</b></p>

