**Data Architect**

**המסלול השלם להכשרת מנהלי מסדי נתונים Cross Platform**

**בסביבת Microsoft ו** - **Oracle**

התוכנית מכילה את כל התכנים לבחינות ההסמכה הבינלאומיות הבאות :

(70-461) - Querying Data with Transact-SQL

(70-462) - Developing SQL Database

( 764-70 ) - Administration a SQL Database Infrastructure

**יתרונותיה הבולטים של התוכנית**

**סדנא מעשית לשיפור ביצועים** דוגמאות מעשיות מעולם העבודה, התמודדות עם מקרי קצה.

**מלאה ומקיפה** ועוסקת בכל ההיבטים של ניהול מסדי נתונים בסביבת SQL Server ו- Oracle , משלבי

העיצוב והפיתוח ועד שלבי הניהול, התחזוקה והבטחת ביצועי פעילות גבוהים.

לימוד **תשתיות תקשורת ,זיכרון, ועיבוד** ככלי להבנה טובה יותר של הבסיס נתונים.

**מעבר הבחינות הבינלאומיות יקנה את התארים:**

**MCSA: SQL SERVER 2016 Database Developer**

**Oracle Certified Professional**

תעודה יוקרתית של הטכניון **Technion Certified DBA** תינתן עם סיומו המוצלח של הקורס לעומדים

בדרישות התוכנית.

**תכנית הלימודים**

**A. Introduction (12 hours)**

**1. Course Introduction (1 hour)** About the Instructor About the Students Course Objectives Course Schedule Course Materials Course Outline

**2. Introduction to Microsoft SQL Server (1 hours)** SQL Server Versions and Editions SQL Server Services and Components SQL Server Client Tools Practice & Homework

**3. Database Design (5 hours)** Entity-Relationship Diagram (ERD) Entities, Attributes & Keys Types of Relationships Inheritance Normalization Rules Denormalization Scenarios The Physical Design Process Types of Tables Practice & Homework

**4. Installing a SQL Server Instance (5 hours)** Preparing to Install SQL Server Upgrade Considerations The Installation Process Configuring the Instance Practice & Homework

**B. Basic Programming with Transact-SQL (40 hours)**

**1. Introduction to the Transact-SQL Language (2 hours)** SQL vs. Transact-SQL Types of Transact-SQL Statements Transact-SQL Syntax Elements System Functions and System Stored Procedures Connections, Sessions, Batches and Transactions Practice & Homework

**2. Programming Basics (3 hours)** Working with Variables Conditional Statements Control of Flow Statements Error Handling Practice & Homework

**3. The SELECT Statement (10 hours)** A Simple Query Formatting the Result Set Filtering the Data Grouping and Sorting Joining Multiple Tables Practice & Homework

**4. Advanced Querying (10 hours)** The CASE Clause Combining Multiple Result Sets Using Sub-Queries Window Functions Using PIVOT and UNPIVOT Common Table Expressions Practice & Homework 

**5. Modifying Data (10 hours)** Inserting Data The UPDATE Statement Deleting Data The MERGE Statement

Using the OUTPUT Clause Practice & Homework

**6. Transactions and Locks (5 hours)** Transactions Overview Lock Types Concurrency Issues Transaction Isolation Levels Locking Hints Deadlocks Nesting Transactions Practice & Homework **C. SQL Server Administration (20 hours)**

**1. All about Databases (5 hours)** Overview of System Databases File groups and Files Introducing the Transaction Log Database Configuration Options Creating a Database Database Maintenance Tasks Database Snapshots Contained Databases Schemas and Database Objects Practice & Homework

**2. All about Tables (5 hours)** System Tables and System Views System Data Types The Use of NULL Creating a Table Special Data Types User-Defined Data Types Table @Variables vs. #Temporary Tables Table Types Sparse Columns Using FILESTREAM and FileTables Working with Spatial Data

Data Compression Practice & Homework

**3. Indexes and Statistics (5 hours)** Introduction to Indexes Physical Structures Special Types of Indexes Creating an Index Guidelines for Planning Indexes The Database Engine Tuning Advisor Introducing Statistics Understanding Execution Plans Index and Statistics Maintenance Practice & Homework

**4. Table Constraints (5 hours)** Data Integrity Overview Primary Key and Unique Constraint Foreign Key Check and Default Constraints Creating and Disabling Constraints Practice & Homework **D. Advanced Programming in SQL Server (8 hours)**

**1. Views (2 hours)** Introduction to Views Modifying Data through a View Indexed Views Partitioned Views Practice & Homework

**2. User-Defined Functions (2 hours)** Introduction to User-Defined Functions Scalar Functions Table-Valued Functions Joining with APPLY Practice & Homework

**3. Stored Procedures (2 hours)** Introduction to Stored Procedures Stored Procedure Interfaces Creating and Executing Stored Procedures Compilation Sequence Practice & Homework

**4. Triggers (2 hours)** Introduction to Triggers The INSERTED and DELETED Tables Creating a Trigger Nested and Recursive Triggers Triggers Pros and Cons Scenarios for Using Triggers Practice & Homework

**E. Managing a SQL Server Environment (30 hours)**

**1. Backup and Recovery (10 hours)** Backup Types Database Recovery Models Understanding the Recovery Process The Restore Operation Recovery Advisor Performing Online Restore Operations Recovering from Database Snapshot Recovering System Databases Planning a Backup Strategy Practice & Homework

**2. SQL Server Security (5 hours)** SQL Server Security Overview Authentication Modes Principals and Securables Managing Permissions Understanding Ownership Chaining Controlling Execution Context SQL Server Auditing Security Best Practices

Practice & Homework

**3. Automation in SQL Server (5 hours)** Introduction to SQL Server Agent Configuring Database Mail Implementing Operators, Jobs and Alerts SQL Server Agent Security Using Maintenance Plans Managing Multiple Instances Policy-Based Management Performance Data Collection Practice & Homework

**4. Monitoring and Troubleshooting (10 hours)** Planning a Monitoring Strategy Windows and SQL Server Logs Extended Events The Dedicated Administrator Connection Resource Governor Performance Tuning Methodologies Practice & Homework

**F. Exploring the Oracle Database Architecture (40 hours)** Oracle Database Instance Architecture Oracle Database Management Tools Configuring the Oracle Network Environment Managing Database Storage Structures Administering User Security Managing Space Managing Data Concurrency Implementing Oracle Database Auditing Backup and Recovery Concepts Performing Database Maintenance Oracle Software Installation Basics Creating an Oracle Database Using DBCA Performing Post-Upgrade Tasks Migrating Data by Using Oracle Data Pump

**G. TSQL Advanced (25 hours)**

**I. Summary Project (5 hours)** Review Additional Resources Feedback