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**Middlesex County College**

**Edison, NJ 08818**

**COURSE ID:** Computer Science and Information Technology Department - CSC 269

# COURSE NAME: ADO.NET Programming

### NUMBER OF CREDITS AWARDED FOR COURSE: 4 credits

**PREREQUISITE OR COREQUISITE COURSES OR ACADEMIC STANDING:**

Prerequisite(s): CSC 267 - Advanced C#.NET Programming

### NEW OR MODIFIED COURSE: New

# SEMESTER AND YEAR COURSE WILL FIRST BE OFFERED: Fall 2013

#### NAME AND TELEPHONE NUMBER OR EMAIL ADDRESS OF DEPARTMENT CHAIR:

Chairperson or Course Coordinator: Dr. Peter Farrett

Office Location: JLC201

E-mail Address: PFarrett@Middlesexcc.edu

Telephone: 732-906-2526

**DETAILED COURSE DESCRIPTION:**

This course provides students with the knowledge and skills to access and modify data stored in relational database systems and to access data in relational sources.  In addition, this course explores the various ways one can employ the ADO.NET entity framework and LINQ to develop and optimize data applications. This course is not designed for transfer.

# OUTLINE OF COURSE OBJECTIVES:

1. Describe data-centric applications, ADO.NET architecture, and ADO.NET and XML.
2. Connect to SQL Server and other data sources.
3. Perform connected database operations including executing SELECT commands, database definition commands, dynamic SQL commands, and commands that return data from a SQL Server database in XML.
4. Build a DataSet schema, populate it with data, and modify the data programmatically.
5. Build a DataSet from an existing data source.
6. Use XML techniques while working with DataSets, including mapping tables and columns, creating XSD schemas, building strongly typed DataSets, and interacting with XMLDataDocuments.
7. Build a Web service that uses ADO.NET to query and update a data source.
8. Use LINQ on top of ADO.NET technology to improve the productivity and the quality of the application.
9. Explain how LINQ to SQL enables development against a logical model which abstracts the low-level details of querying ADO.NET tables and result sets.
10. Explain how to use the Entity Framework to work with data in database applications.

**TEXTS, JOURNALS, AND OTHER MATERIALS USED IN COURSE:**

Boehm, Anne, and Ged Mead. Murach's ADO.NET 4 Database Programming With C# 2010. ISBN: 978-1-890774-63-9

## SUGGESTED GRADING CRITERIA:

3 Examinations 30%

Final Examination 20%

Lab Assignments 25%

Quizzes 10%

Homework 15%

100%

**SCHEDULE OF TOPICS TO BE COVERED:**

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| **1.** Data-Centric Applications and ADO.NET | |
| Design of Data-Centric Applications  ADO.NET Architecture  ADO.NET and XML | |
| **2.** Connecting to Data Sources | |
| Choosing a .NET Data Provider  Defining a Connection  Managing a Connection  Handling Connection Exceptions  Connection Pooling | |
| **3.** Performing Connected Database Operations | |
| Working in a Connected Environment  Building Command Objects  Executing Commands That Return a Single Value  Executing Commands That Return Rows  Executing Commands That Do Not Return Rows  Using Transactions | |
| **4.** Building DataSets | |
| Working in a Disconnected Environment  Building DataSets and DataTables  Binding and Saving a DataSet  Defining Data Relationships  Modifying Data in a DataTable  Sorting and Filtering | |
| **5.** Reading and Writing XML with ADO.NET | |
| Creating XSD Schemas  Loading Schemas and Data into DataSets  Writing XML from a DataSet | |
| **6.** Building DataSets from Existing Data Sources | |
| Configuring a DataAdapter to Retrieve Information  Populating a DataSet Using a DataAdapter  Configuring a DataAdapter to Update the Underlying Data Source  Persisting Changes to a Data Source  How to Handle Conflicts | |
| **7.** Using LINQ to SQL |
| Implementing a Logical Data Model using LINQ to SQL  Managing Performance and Handling Concurrency |

**8.** Using the Entity Framework to Work with Data in Database Applications

Create an Entity Data Model

Use the Entity Data Model Designer

Use LINQ to Entities

Insert, update, and delete data

Use bound controls with entities

**Course Abstract**

**Course ID and Name:** CSC 269 – ADO.NET Programming

**Department:** Computer Science and Information Technology

Chairperson or Course Coordinator: Dr. Peter Farrett

Office Location: JLC201

E-mail Address: PFarrett@Middlesexcc.edu

Telephone: 732-906-2526

**Prerequisites:** CSC 267, Advanced C#.NET Programming **Co-requisites:** None

**Course Description:** This course provides students with the knowledge and skills to access and modify data stored in relational database systems and to access data in relational sources.  In addition, this course explores the various ways one can employ the ADO.NET entity framework and LINQ to develop and optimize data applications.  This course is not designed for transfer.

**General Education Status:** No

**Credits:** 4 **Lecture Hours:** 2  **Lab Hours:** 4

**Learning Outcomes:**

1. Connect to SQL Server and other data sources.
2. Perform connected database operations including executing SELECT commands, database definition commands, dynamic SQL commands, and commands that return data from a SQL Server database in XML.
3. Build a DataSet schema, populate it with data, and modify the data programmatically.
4. Build a DataSet from an existing data source.
5. Use XML techniques while working with DataSets, including mapping tables and columns, creating XSD schemas, building strongly typed DataSets, and interacting with XMLDataDocuments.
6. Build a Web service that uses ADO.NET to query and update a data source.

**Course Content Areas:**

|  |  |
| --- | --- |
| **1.** Data-Centric Applications and ADO.NET | |
| Design of Data-Centric Applications  ADO.NET Architecture  ADO.NET and XML | |
| **2.** Connecting to Data Sources | |
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Department: Computer Science and Information Technology Academic Year: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Program or Course: CSC 269 - ADO.NET Programming

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| **OUTCOMES/ACHIEVEMENTS:**  (What do you expect students to know, be able to do, etc. at the completion of the course or program? | **RELATED MEASURES:** (What is the academic direct measure or indirect indicator that is being used to assess student outcomes or achievements?) |
| 1. Connect to SQL Server and other data sources. 2. Perform connected database operations including executing SELECT commands, database definition commands, dynamic SQL commands, and commands that return data from a SQL Server database in XML. 3. Build a DataSet schema, populate it with data, and modify the data programmatically. 4. Build a DataSet from an existing data source. 5. Use XML techniques while working with DataSets, including mapping tables and columns, creating XSD schemas, building strongly typed DataSets, and interacting with XMLDataDocuments. 6. Build a Web service that uses ADO.NET to query and update a data source. | 1. Exams 2. Quizzes 3. Lab Assignments |

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| **ACHIEVEMENT TARGET:** (What score, rating, etc. do you hope to see from this Measure-Outcome/Objective relationship?) |
| Students will achieve a minimum of 60% benchmark in the class. |

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| **FINDINGS:** (What are your assessment results?) |
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| **ACTION PLAN:** (How are you taking the data gained from the assessment process and applying this knowledge to improve student learning?) |
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