



Introduction to Modern Databases with MongoDB

Course Overview

This course provides an introduction to modern general purpose databases, with MongoDB used as the example database system. The course compares and contrasts non-relational and relational databases, outlines MongoDB's architecture, and presents best practices for modeling data in MongoDB, among other topics.

Lessons: 22

Length: 16 hours

Level: Beginner to Intermediate

Course Content

This course consists of twenty-two lessons in slide format. Each lesson has a slide deck with lecture notes and a PDF handout. Quiz questions with explained answers and instructions for hands-on exercises are included on slides interspersed throughout. All course content can be accessed in the [Google Drive folder](#).

The materials are freely available for non-commercial use and are licensed under Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported [License](#).

Prerequisite Knowledge

This course is designed for learners new to MongoDB and the document model. Prior knowledge of relational databases and SQL will be helpful for the learner.

Topics Covered

Learning objectives for each lesson are included in the lesson slide decks. At a high level, the course covers the following topics:

- The elements of a modern general purpose database
- The differences between relational and non-relational databases
- Querying data using MongoDB Query Language (MQL)
- Performing CRUD operations in MongoDB
- Data modeling and schema design patterns
- Using the MongoDB aggregation framework
- Sharding, indexing, transactions, and change streams in MongoDB

Suggested Uses

Educators are welcome to teach the entire course sequentially or select individual lessons and/or slides as needed. The course materials can be incorporated into your curriculum in a variety of ways:

- Slide decks can easily be used during a lecture class.
- Lessons can be combined with self-paced online learning and labs. Each lesson includes suggestions for complementary learning content.
- The PDF handouts can be used for asynchronous learning or as supplemental material to be completed outside of class.
- The slides and handouts can be used for self-paced learning for students and educators alike.

The course materials can be used in conjunction with self-paced learning and labs to create a complete semester-long curriculum. It will take approximately 16 hours of lecture time to cover all of the lessons. This course pairs well with the online, self-paced [MongoDB Basics](#) course, offered for free in [MongoDB University](#). The Basics course includes 2.5 hours of video lectures and 6 hours of hands-on labs and quizzes.

We've also combined a subset of the lessons to create shorter, more targeted course topics:

- [Querying Non-Relational Databases](#)
- [MongoDB Aggregation Framework](#)
- [MongoDB: A Developer Data Platform](#)

Lessons

Directly access the slide deck for each lesson using the links below.

- 1 - [What is a Modern General Purpose Database?](#)
- 2 - [Relational vs. Non-Relational Databases](#)
- 3 - [Non-Relational Database Types](#)
- 4 - [When to Use Non-Relational Databases](#)
- 5 - [The Document Model and MongoDB](#)
- 6 - [MongoDB: A Developer Data Platform](#)
- 7 - [MongoDB Architecture](#)
- 8 - [MongoDB Atlas](#)
- 9 - [Querying in Relational and Non-Relational Databases](#)
- 10 - [MongoDB Query Language \(MQL\)](#)
- 11 - [Querying Complex Data in MongoDB with MQL](#)
- 12 - [Querying Data with Operators and Compound Conditions](#)
- 13 - [Inserting and Updating Data in MongoDB](#)
- 14 - [Deleting Data in MongoDB](#)
- 15 - [The MongoDB Aggregation Framework](#)

- 16 - [Querying Data in MongoDB with the Aggregation Framework](#)
- 17 - [Data Modeling and Schema Design Patterns](#)
- 18 - [Sharding in MongoDB](#)
- 19 - [Indexing in MongoDB](#)
- 20 - [Transactions in MongoDB](#)
- 21 - [Change Streams in MongoDB](#)
- 22 - [Drivers, Connectors, and the Ecosystem](#)

Hands-On Exercises

The hands-on exercises use the browser-based [MongoDB Web Shell](#), running on MongoDB's servers, to ensure that the only technical requirement is a browser and internet access to the MongoDB Web Shell site.

Share Your Feedback

We hope these curriculum materials will be a valuable resource for you and your learners. Let us know how the materials work for you, what we can improve on, and how MongoDB for Academia can support you via our brief [feedback form](#).

MongoDB for Academia

MongoDB for Academia offers resources for educators and students to support teaching and learning MongoDB. Check out our [educator resources](#) and join the Educator Community. Students can receive \$50 in Atlas credits and free certification through the [Github Student Developer Pack](#).

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