

MySQL® is the open source community's most popular Relational Database Management System (RDBMS) offering, and is a key part of LAMP – Linux™, Apache™, MySQL®, PHP/Perl/Python®. Many Fortune 500 companies adopt MySQL to reap the benefits of an open source, platform-independent RDMS, such as simplifying conversion from other platforms and lowering database Total Cost of Ownership by 90%. This class encourages the student to explore database fundamentals, as well as MySQL features. Students learn the basics of MySQL use and the programming of stored routines and triggers. Students also participate in database design discussions, and learn about optimization. Also included is an exploration of various APIs. This course covers MySQL 5.5

Course Objectives:

- Describe MySQL’s benefits and features.
- Configure the MySQL server.
- Perform database design and normalization.
- Work with the command-line mysql tool.
- Set up and manage data and data schemas in MySQL.
- Use SELECT to retrieve data from a database.
- Combine data from multiple sources.
- Utilize more complex SQL functionality
- Understand the MySQL storage engine types and their applicability.
- Use some of the more common MySQL standalone tools.
- Write and call stored procedures.

Audience: Application and web developers, or system administrators.

Prerequisites: Prior experience installing software and programming in any language, such as HTML, is recommended but not required.

Number of Days: 3 days

<p>1 Course Introduction Course Objectives Course Overview Using the Workbook Suggested References</p>	<p>2 Introduction to Database Concepts and MySQL Features of a Relational Database Where does SQL Fit in? Database Access Why MySQL? The History of MySQL</p>	<p>Database Entities The Primary Key Foreign Key Relationships Data Models and Normalization Second Normal Form (2NF) Third Normal Form (3NF) and Beyond Translating a Data Model into a Database Design</p>
<p>3 Database Design Developing the Design of a Database</p>	<p>4 MySQL Client Software and the mysql Command-Line Tool Available Client Software Environment Variable Running the mysql Client Customizing the mysql Prompt</p>	

	mysql Commands		Expressions and Functions
	Using the Help Command		Control Flow Operators and Functions
	Some Useful mysql Options		Function Names
	Working with a Database		Comparison Operators and Functions
	Examining Table Definitions		String Functions
	Other SHOW Options		Numeric Operators and Functions
5	DDL – Data Definition Language		Date and Time Functions
	DDL & DML Overview		Forcing Data Interpretation
	Building Table Definitions		Miscellaneous Functions
	Identifiers	8	Building a Result Set from Several Sources
	Column Definitions		UNION
	Numeric Datatypes		Combining Data from Two Tables
	ENUM and SET Types		Using WHERE to Choose Matching Rows
	Date and Time Datatypes		INNER JOIN
	AUTO_INCREMENT		OUTER JOINS
	UNIQUE Constraints		Multiple Tables, Fields, Joins, and Ordering
	Primary Keys		SELECT * and USING Columns
	Modifying Tables	9	Advanced SQL Techniques
	Foreign Keys		MySQL Pattern Matching
	Renaming and Dropping Tables		Multipliers, Anchors, and Grouping
6	DML – Data Manipulation Language		GROUP BY
	DDL & DML Overview		Aggregates
	Data Values: Numbers		Subqueries
	Data Values: Strings		Subquery Comparisons and Quantifiers
	Working with NULL Values		Other Subqueries
	Bulk Loading of Data		Subquery Alternatives and Restrictions
	Bulk Data Format		InnoDB Multi-Table Updates and Deletes
	Working with Special Values in Bulk Data		Building a VIEW
	Adding New Table Rows with INSERT		Updatable VIEWs
	Copying Rows	10	MySQL Storage Engines
	UPDATE		Storage Engine Overview
	REPLACE		Other Storage Engine Types
	Removing Table Rows		The Basics of Commonly Used Storage Engines
	Transactions		MyISAM Limits and Features
	InnoDB: Using Transactional Processing		MyISAM Data File Format
	Locking Tables		InnoDB and Hardware Limitations
7	Queries – The SELECT Statement		InnoDB Shared Tablespace Configuration
	SELECT Syntax Summary		InnoDB Per-Table Tablespaces
	Choosing Data Sources and Destinations for SELECT		InnoDB Data Management
	Presentation of Table Data with SELECT		MEMORY and FEDERATED
	Being Selective about Which Rows are Displayed		
	User-Defined Variables		

- MERGE and ARCHIVE
- 11 Utilities**
 - Client Overview
 - Specifying Options for Command-Line Clients
 - Client Option Files
 - Checking Tables with myisamchk and mysqlchk
 - Using myisamchk and mysqlchk for Repairs
 - mysqlshow and mysqlimport
 - Using mysqldump
 - The MySQL Workbench - General
 - MySQL Workbench - Execution
 - MySQL Administration via the Workbench
 - Data Modeling with the Workbench
 - SQL Development
 - Third Party Tools
- 12 Database Programmability**
 - Stored Routines: Basic Concepts
 - Routine Creation and Use
 - Flow Control Statement
 - Writing Blocks of Code
 - Triggers
 - Stored Routines, Triggers, and the Binary Log
 - Table HANDLERS
 - Prepared Statements
- 13 Optimization and Performance Tuning**
 - Optimizing the MySQL Server's Interaction with the External World
 - Adjusting the MySQL Server Configuration
 - Optimizing Your Database
 - Table Partitioning
 - Optimizing Queries
 - The Use of Indexes to Support Queries
 - Thinking about JOIN Queries
 - Query Sorts, Indexes, and Short-Circuiting
 - INSERT, UPDATE, DELETE, and Table Locks
 - Some General Optimizations
- Optimizations Specific to MyISAM
 - Optimizations Specific to InnoDB
- 14 Appendix A: Installation, Configuration, and Upgrading**
 - MySQL Software
 - Preparing to Install MySQL After the Download
 - Configuring the Server
 - Starting the Server
 - The Initial User Accounts
 - Verifying Server Operation
 - Upgrading
 - Copying a Database between Architectures
- 15 Appendix B: MySQL Programming Interfaces**
 - Database Application Architectures
 - Connecting MySQL to ODBC
 - Connecting MySQL to MS/Office and MS/Access
 - Connecting to MySQL from Perl
 - Programming Perl to MySQL
 - Connecting to MySQL from PHP
 - Programming PHP to MySQL