

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, perform administrative functions, learn about optimization and performance tuning, and explore 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.
- Manage database resources and users.
- Write and call stored procedures.
- Optimize database storage for performance.
- Connect MySQL to external programming interfaces.

**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:** 4 days

1	<p><b>Course Introduction</b>                  Course Objectives                  Course Overview                  Using the Workbook                  Suggested References</p>		
2	<p><b>Introduction to Database Concepts and MySQL</b>                  Features of a Relational Database                  Where does SQL Fit in?                  Database Access                  Why MySQL?</p>	3	<p>The History of MySQL  <b>Installation, Configuration, and Upgrading</b>                  MySQL Software                  MySQL Software Features                  Preparing to Install MySQL                  Available Client Software                  After the Download                  Configuring the Server                  Starting the Server                  The Initial User Accounts</p>

	Verifying Server Operation		Working with Special Values in Bulk Data
	Upgrading		Adding New Table Rows with INSERT
	Copying a Database between Architectures		Copying Rows
	Environment Variables		UPDATE
<b>4</b>	<b>Database Design</b>		REPLACE
	Developing the Design of a Database		Removing Table Rows
	Database Entities		Transactions
	The Primary Key		InnoDB: Using Transactional Processing
	Foreign Key Relationships	<b>8</b>	Locking Tables
	Data Models and Normalization		<b>Queries – The SELECT Statement</b>
	Second Normal Form (2NF)		SELECT Syntax Summary
	Third Normal Form (3NF) and Beyond		Choosing Data Sources and Destinations for SELECT
	Translating a Data Model into a Database Design		Presentation of Table Data with SELECT
<b>5</b>	<b>The mysql Command-Line Tool</b>		Being Selective about Which Rows are Displayed
	Running the mysql Client		User-Defined Variables
	Customizing the mysql Prompt		Expressions and Functions
	mysql Commands		Control Flow Operators and Functions
	Using the Help Command		Function Names
	Some Useful mysql Options		Comparison Operators and Functions
	Working with a Database		String Functions
	Examining Table Definitions		Numeric Operators and Functions
	Other SHOW Options		Date and Time Functions
<b>6</b>	<b>DDL – Data Definition Language</b>		Forcing Data Interpretation
	DDL & DML Overview		Miscellaneous Functions
	Building Table Definitions		<b>9 Building a Result Set from Several Sources</b>
	Identifiers		UNION
	Column Definitions	<b>9</b>	Combining Data from Two Tables
	Numeric Datatypes		Using WHERE to Choose Matching Rows
	ENUM and SET Types		INNER JOIN
	Date and Time Datatypes		OUTER JOINS
	AUTO_INCREMENT		Multiple Tables, Fields, Joins, and Ordering
	UNIQUE Constraints		SELECT * and USING Columns
	Primary Keys		<b>10 Advanced SQL Techniques</b>
	Modifying Tables		MySQL Pattern Matching
	Foreign Keys		Multipliers, Anchors, and Grouping
	Renaming and Dropping Tables		GROUP BY
<b>7</b>	<b>DML – Data Manipulation Language</b>		Aggregates
	DDL & DML Overview		Subqueries
	Data Values: Numbers		Subquery Comparisons and Quantifiers
	Data Values: Strings		
	Working with NULL Values		
	Bulk Loading of Data		
	Bulk Data Format		

	Other Subqueries		Miscellaneous Functions
	Subquery Alternatives and Restrictions		User Account Management
	InnoDB Multi-Table Updates and Deletes		Understanding User Privileges
	Building a VIEW		User Account Rights Management
	Updatable VIEWS		User Account Privileges
<b>11</b>	<b>MySQL Storage Engines</b>	<b>14</b>	<b>Database Programmability</b>
	Storage Engine Overview		Stored Routines: Basic Concepts
	Other Storage Engine Types		Routine Creation and Use
	The Basics of Commonly Used Storage Engines		Flow Control Statement
	MyISAM Limits and Features		Writing Blocks of Code
	MyISAM Data File Format		Triggers
	InnoDB and Hardware Limitations		Stored Routines, Triggers, and the Binary Log
	InnoDB Shared Tablespace Configuration		Table HANDLERS
	InnoDB Per-Table Tablespaces		Prepared Statements
	InnoDB Data Management	<b>15</b>	<b>Optimization and Performance Tuning</b>
	MEMORY and FEDERATED		Hardware Limitations
	MERGE and ARCHIVE		Optimizing the MySQL Server's Interaction with the External World
<b>12</b>	<b>Utilities</b>		Adjusting the MySQL Server Configuration
	Client Overview		Optimizing Your Database
	Specifying Options for Command-Line Clients		Table Partitioning
	Client Option Files		Optimizing Queries
	Checking Tables with myisamchk and mysqlchk		The Use of Indexes to Support Queries
	Using myisamchk and mysqlchk for Repairs		Thinking about JOIN Queries
	mysqlshow and mysqlimport		Query Sorts, Indexes, and Short- Circuiting
	Using mysqldump		INSERT, UPDATE, DELETE, and Table Locks
	The MySQL Workbench - General		Some General Optimizations
	MySQL Workbench - Execution		Optimizations Specific to MyISAM
	MySQL Administration via the Workbench		Optimizations Specific to InnoDB
	Data Modeling with the Workbench	<b>16</b>	<b>MySQL Programming Interfaces</b>
	SQL Development		Database Application Architectures
	Third Party Tools		Connecting MySQL to ODBC
<b>13</b>	<b>Administering a Database and Users</b>		Connecting MySQL to MS/Office and MS/Access
	The Server-Side Programs		Connecting to MySQL from Perl
	Starting the MySQL Server		Programming Perl to MySQL
	Using SET for Server Options		Connecting to MySQL from PHP
	Table Management		Programming PHP to MySQL
	Server Log Files		
	mysqladmin		
	Backup and Restore		