SQL Course Outlines

Lab 1

- How to use MySQL Workbench and other development tools
- Make sure the MySQL server is running
- Use MySQL Workbench to create the My Guitar Shop database.
- Use MySQL Workbench to review the My Guitar Shop database
- **Optional Exercises:** Overview Homework

Lab 2

- How to retrieve data from a single table
- Distinguish between the base table values and the calculated values in SELECT statements.
- Describe the use of a column alias.
- Describe the order of precedence and the use of parentheses for arithmetic expressions.
- Describe the use of the CONCAT function in string expressions.
- Describe the use of functions with strings, dates, and numbers.
- Describe the use of the DISTINCT keyword.
- Describe the use of comparison operators, logical operators, and parentheses in WHERE clauses.
- Describe the use of the IN, BETWEEN, and LIKE operators in WHERE clauses.
- Describe the use of IS NULL in a WHERE clause.
- Describe the use of column names, column aliases, calculated values, and column numbers in ORDER BY clauses.
- **Optional Exercises:** Running your own SELECT statements

Lab 3

- How to retrieve data from two or more tables
- **Optional Exercises:** Retrieve data from two tables

Lab 4

- How to insert, update, and delete data
  Applied
- Create a copy of a table that can be used for testing INSERT, UPDATE, and DELETE statements.
- Given the specifications for an action that modifies data, code the INSERT, UPDATE, or DELETE statement for doing the action.
- Describe MySQL's default behavior when you execute an INSERT, UPDATE, or DELETE statement.
- Explain how to handle null values and default values when coding INSERT and UPDATE statements.
- **Optional Exercises:** How to insert, update, and delete data

Lab 5

- How to code summary queries
- Describe summary queries.
- Describe the differences between the HAVING clause and the WHERE clause.
- Describe the use of the WITH ROLLUP operator.
- Code summary queries that use aggregate functions, including queries that use the WITH ROLLUP operator.
- **Optional Exercises:** Code Summary queries

Lab 6

- How to code subqueries
- Code SELECT statements that require subqueries.

- Describe the way subqueries can be used in the WHERE, HAVING, FROM and SELECT clauses of a SELECT statement.
- Describe the difference between a correlated subquery and a noncorrelated subquery.
- **Optional Exercises:** How to code subqueries

Lab 7

- How to work with data types
- Code queries that convert data from one data type to another.
- Describe the data that can be stored in any of the character, numeric, date/time, and large object data types.
- Describe ENUM and SET data types.
- MySQL data type categories (Character, Numeric, Data and Time, Large Objects Lob, Spatial)
- **Optional Exercises:** How to work with data types

Lab 8

- How to use functions
- Code queries that format numeric or date/time data.
- Code queries that require any of the scalar functions presented in this chapter.
- Describe how the use of functions can solve the problems associated with (1) sorting string data that contains numeric values, and (2) doing date or time searches.
- **Optional Exercises:** How to use functions

Lab 9

- How to design a database
- Given the specifications for a database, identify the tables, columns, keys, relationships, and indexes for the database.

- Given the tables for an unnormalized database, normalize the structure to the third normal form.
- Use MySQL Workbench to create or work with an EER model for a database and any EER diagrams that are associated with that model.
- **Optional Exercises:** How to design a database

Lab 10

- How to create databases, tables, and indexes
- Describe how each of these types of constraints restricts the values that can be stored in a table: not null, unique, primary key, and foreign key.
- Describe the difference between a column-level constraint and a table-level constraint.
- Describe the use of an index.
- Describe the use of a script for creating the tables of a database.
- Describe two-character sets that are commonly used with MySQL and the pros and cons of each character set.
- Describe how a collation works with a character set.
- Describe two storage engines that are commonly used with MySQL and the pros and cons of each engine.
- **Optional Exercises:** How to create databases, tables, and indexes

Lab 11

- How to create views
- Describe a view.
- Describe the benefits of using views.
- Given a view, determine whether it is updatable.
- Describe the effect of the WITH CHECK OPTION clause on an updatable view.

- Create and use views, including read-only and updatable views.
- Optional Exercises: How to create views

Mid Term Instructions

- Database Concepts Spring 2016
- **Practical SQL Problems North Wind database**