Course Syllabus A↓

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MEDB 5508 Introduction to SQL

Course syllabus, University of Missouri - Kansas City

Fall 2020

Questions you may have about your instructors

Who will be my instructor(s)?

Suman Sahil, MS, Steve Simon, PhD

Which UMKC Department is this course from?

Department of Biomedical and Health Informatics

How do my instructors prefer to be contacted outside of class?

Suman Sahil, 816-235-1812, ✉ **sumans@umkc.edu (mailto:sumans@umkc.edu)**, Steve Simon, 816-235-6617, ✉ **simons@umkc.edu (mailto:simons@umkc.edu)**

Preferred Contact Method

Email.

How quickly can I anticipate hearing back from one of my instructors if I ask send an email or post a question?

Most emails and phone calls will be returned within 24 hours. Email enquiries sent outside the regular work week may take longer for a response.

If I'd like to drop-in to talk with my instructors about questions, applications of what we've discussed in class, or their research, when can I do that?

Office hours are by appointment only, and will be conducted using the Zoom video conference system.

Where are my instructors' links for us to meet outside of class?

Zoom links will be sent by email once an appointment has been scheduled.

Common Questions about Course Details

Catalog Course ID

MEDB 5508-0001 (45837)

How many Credit Hours will I receive after successfully completing this course?

2

What are the Meeting Times and Location for the course?

This is an online class with no pre-specified meeting times.

What is the format of this course?

Asynchronous online.

What is this course about (Course Description)?

SQL (Structured Query Language) is the primary language responsible for managing data and data structures contained within a relational database management system (RDBMS). Put simply, SQL is the language we use to interact with a database. A working knowledge of SQL is a vital skill for anyone involved in quantitative research.

What are the knowledge, skills or perspectives (Student Learning Outcomes) that I will gain from the course?

This course will introduce retrieving data using the SQL SELECT Statement, restricting and sorting data, reporting aggregated data using the group functions, displaying data from multiple tables, write subqueries and more through hands-on exercises. Students will develop the fundamental skills needed in retrieving, sorting, aggregating and displaying datasets using Structured Query Language (SQL).

Are there Pre-requisites/Co-requisites that are key to my success in this course?

This course will provide a working familiarity with SQL. Students are not expected to have advanced programming or statistical analysis skills. A basic understanding of statistical terminology and a working familiarity with computer-based data files (e.g., Excel) is necessary. The class will introduce basic methods for SQL (Structured Query Language). This class will not cover database administration, installation, and configuration but will provide you with a firm foundation to address these areas in your advanced classes or in your research efforts, including thesis/dissertation research.

General Policies for UMKC Courses

Will I be dropped from class if I not attend class? What happens if I do not attend class without communicating with my instructor?

Maintaining accurate enrollment records throughout the term is a partnership between instructors and students. Instructors are responsible for verifying student attendance and participation within the first three weeks (16 week course) through the Attendance Verification Survey (administered through UMKC Connect) as well as maintain records of participation throughout the term so that the last date of

attendance for students with recorded "F" or "W" final grades may be submitted. Because student plans for enrollment sometimes change prior to the semester start, students not engaging in courses through the initial weeks of each course may be administratively dropped. For more detailed information regarding the policy, **click here** ☒ **(https://catalog.umkc.edu/undergraduate-academic-regulations-information/registration/administrative-drop-policy/)**

How do I get permission before recording class sessions?

Instructor(s) may record class sessions for the sole purpose of sharing the recording with students who can't attend class. Instructor(s) will take care not to disclose personally identifiable information from the student education records during the recorded lesson. Students are not permitted to record class sessions without written consent from the course instructor.

Is there Recommended Technology that I should have access to?

You will need access to the computing resources necessary to complete this course through personal and/or University channels (e.g., computer labs). Our course will take place within the Canvas LMS and utilizing various software technologies that facilitate interaction and communication. We can make alternate arrangements should your reason for being without computer access warrant an accommodation (note: travel for vacation/work does not necessitate accommodations). Below is a list of some helpful computer requirements for full participation in this online class: the latest version of Java; the latest version of QuickTime; the latest version of Adobe Reader; a current version of word processing software or a text editing program; a headset with microphone; a webcam; Google Chrome, Firefox, or Edge for Windows computers; Google Chrome, Firefox, or Safari for Apple computers. Broadband Internet connection is preferred. Examples of broadband Internet connection are high-speed DSL or a Cable modem.

If I am having difficulty is there Technical Support that I can contact?

The links below will connect you with answers and information for the most common technical questions and issues students experience: **UM System Keep Learning** ☒ **(https://keeplearning.umsystem.edu/students)** ; **UMKC Instructional Design/Technology** ☒ **(https://idt.umkc.edu/support)**

What other academic policies should I review?

Additional important information about UMKC's policies and resources can be found **here** ☒ **(https://online.umkc.edu/support-policies)** .

COVID-19 Policies

Do I need to have a Mask/Face-Coverings while on campus?

UMKC's mask/face-coverings policy is available **here** ☒ **(https://www.umkc.edu/coronavirus/)** . Any student requesting an ADA accommodation for the University mask/face covering policy should contact

Scott Laurent the Office of Disability Services as soon as possible by calling (816) 235-5696 or via email at ✉ **laurentr@umkc.edu (mailto:laurentr@umkc.edu)**.

If I have a disability (including COVID-related disabilities), who can assist me with getting important accommodations on campus?

Any student seeking COVID-related academic accommodations should contact Scott Laurent the Office of Disability Services as soon as possible by calling (816) 235-5696 or via email at ✉ **laurentr@umkc.edu (mailto:laurentr@umkc.edu)**.

If I have questions regarding COVID-19 General Information, where do I go?

Up to date information and FAQs regarding COVID-19 may be found on the **UMKC COVID website** ⬀ **(https://www.umkc.edu/news/coronavirus.html)** .

Specific Information about this class

Required and Recommended Materials

There is NO required textbook for this class. A recommended textbook is Learning SQL- Master SQL Fundamentals, By Alan Beaulieu Publisher: O'Reilly Media. Dr. Simon and Suman Sahil have copies of this book and students may review by appointment. Online tutorials include **w3schools** ⬀ **(https://www.w3schools.com/sql/)** (this may be used as a step by step tutorial or you as a reference to learn more about a specific SQL command), **SQL Tutorial** ⬀ **(http://www.sqltutorial.org/)** (this site organizes the SQL commands into groups for easy review).

Course Expectations, Course Policies, Requirements and Standards for Student Coursework and Student Behavior

You are expected to do your homework independently. You can seek help from your instructors, from colleagues, or from the Internet to help decode an error message that you don't understand. You can adapt code that you find on the Internet. We recommend that you acknowledge the source for that code in the comments of your program, but this is not required.

Evaluation and Grading

Students will be required to post messages on the Canvas discussion boards, take brief quizzes on Canvas, and submit homework assignments in PDF format on Canvas. Your work is due on the specified date. If illness, work responsibilities, or other commitments prevent you from completing on time, please contact one of the instructors before the due date. Late submission without prior notice will receive a one point deduction.

This course is grade Credit/No Credit (Pass/Fail). Students who complete at least 80% of the regular coursework and score at least 80% on the final exam will receive credit for the course.

Final Exam

Your final exam will be posted on Canvas on December 4, 2020 and needs to be completed prior to December 18, 2020.

Description of Course Topics, Assignments, Requirements and Assignment deadlines

Student Learning Outcomes

At the completion of this course, students will be able to:

- Retrieve Data Using the SQL SELECT Statement

- Restrict and Sort Data

- Use Single-Row Functions to Customize Output

- Report Aggregated Data Using the Group Functions

- Use Conversion Functions and Conditional Expressions

- Display Data from Multiple Tables using joins

- Use the Set Operators

- Use Subqueries to Solve Queries

Introduction

- What is a relational database

- Basic database terminology: table, record, field

- History of the SQL language

Options for running SQL

- Command line versus graphical user interface

- Running SQL from inside R and SAS

Database security

- Protecting passwords

- Preventing SQL Injection attacks

Retrieving Data Using the SQL SELECT Statement

- Retrieving a limited number of fields

- Retrieving distinct values

- Changing field names

Sorting and Restricting Data

- Limit the rows that are retrieved by a query

- Sort the rows that are retrieved by a query

- Random sample

Null values

- Logic statements involving NULL values

- Excluding records with NULL values

Using Single-Row Functions to Customize Output

- Describe various types of functions available in SQL

- Use character, number, and date functions in SELECT statements

- How functions handle NULL values

Reporting Aggregated Data Using the Group Functions

- Describe the use of group functions

- Identify the available group functions

- Group data by using the GROUP BY clause

- Include or exclude grouped rows by using the HAVING clause

Using Conversion Functions and Conditional Expressions

- CASE statement

- Manipulating dates

Retrieving data from multiple tables: Overview

- Basic terminology: primary keys, foreign keys

- One to one, many to one, many to many merges

- Reading a database schema

Displaying Data from Multiple Tables

- Generate a Cartesian product of all rows from two or more tables

- Matching using an equijoin

- Matching using the NOT EXISTS criteria

- The importance of aliases in joining tables

- Handling unmatched records: inner, left, right, and outer join

- Join a table to itself by using a self-join

Storage and retrieval of longitudinal data

- Separating time varying from time constant data

- Creating a "tall and thin" format for longitudinal data

- Creating a "short and fat" format for longitudinal data

- Computing change scores

Using the Set Operators

- Describe set operators

- Use a set operator to combine multiple queries into a single query

Using Subqueries to Solve Queries

- Describe the types of problems that the subqueries can solve

- Define subqueries

- Write single-row and multiple-row subqueries

- List the types of subqueries

Key Dates for Fall semester, 2020 (16-week session only)

August 28

- Last day for 100% refund

- Last day to add without an instructor signature

September 7

- Labor Day Holiday - University Closed

September 21

- Last day for 50% refund

- Last day to drop a class and not have it appear on your transcript

- Census Day

- Last day to change credit to audit (undergraduate)

October 16

- Last day for 25% refund

- Last day to withdraw with a W (graduate/professional)

October 31

- Last Day to File for December Graduation

November 13

- Last day to withdraw (undergraduate)

November 23

- Thanksgiving Holiday Begins

November 30

- Course Work Resumes

December 11

- Last day to withdraw with assessment (W or WF) (graduate/professional)

- Last day to change credit to audit (graduate/professional)

- Last Day of Classes

December 14

- Exams Begin

December 18

- Exams End

- Classes End (final exams)

This document was written on 2020-08-22 and last modifed on 2020-08-23.

Course Summary:

Date	Details	
Fri Jan 22, 2021	📝 **Discuss01, Introduce yourself (https://umkc.instructure.com/courses/65702/assignments/279225)**	due by 11:59pm

| Date	Details	
	📝 **Discuss01b, How do you plan to access SQL** [(https://umkc.instructure.com/courses/65702/assignments/279223)](https://umkc.instructure.com/courses/65702/assignments/279223)	due by 11:59pm
	📝 **Discuss02a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279224)](https://umkc.instructure.com/courses/65702/assignments/279224)	due by 11:59pm
	📝 **Hw02, Practice using the SELECT statement** [(https://umkc.instructure.com/courses/65702/assignments/279235)](https://umkc.instructure.com/courses/65702/assignments/279235)	due by 11:59pm
	📝 **Hw02b, Practice using the SELECT statement for EHR Data** [(https://umkc.instructure.com/courses/65702/assignments/279236)](https://umkc.instructure.com/courses/65702/assignments/279236)	due by 11:59pm
	📝 **Quiz02, The SELECT statement** [(https://umkc.instructure.com/courses/65702/assignments/279199)](https://umkc.instructure.com/courses/65702/assignments/279199)	due by 11:59pm
	📝 **Discuss03a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279228)](https://umkc.instructure.com/courses/65702/assignments/279228)	due by 11:59pm
	📝 **Discuss03b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279218)](https://umkc.instructure.com/courses/65702/assignments/279218)	due by 11:59pm
Fri Jan 29, 2021	📝 **Quiz03a. Introduction to Structured Query Language** [(https://umkc.instructure.com/courses/65702/assignments/279250)](https://umkc.instructure.com/courses/65702/assignments/279250)	due by 11:59pm
	📝 **Quiz03b, History of SQL** [(https://umkc.instructure.com/courses/65702/assignments/279210)](https://umkc.instructure.com/courses/65702/assignments/279210)	due by 11:59pm
Fri Feb 5, 2021	📝 **Discuss04a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279226)](https://umkc.instructure.com/courses/65702/assignments/279226)	due by 11:59pm
	📝 **Discuss04b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279217)](https://umkc.instructure.com/courses/65702/assignments/279217)	due by 11:59pm
	📝 **Hw04a, Practice with sorting and restricting data - EHR Data** [(https://umkc.instructure.com/courses/65702/assignments/279237)](https://umkc.instructure.com/courses/65702/assignments/279237)	due by 11:59pm

Date	Details	
	📝 **Hw04b, Practice with the where keyword** [(https://umkc.instructure.com/courses/65702/assignments/279238)](https://umkc.instructure.com/courses/65702/assignments/279238)	due by 11:59pm
	📝 **Quiz04a, Sorting and restricting** [(https://umkc.instructure.com/courses/65702/assignments/279209)](https://umkc.instructure.com/courses/65702/assignments/279209)	due by 11:59pm
Fri Feb 12, 2021	📝 **Discuss05a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279227)](https://umkc.instructure.com/courses/65702/assignments/279227)	due by 11:59pm
	📝 **Discuss05b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279216)](https://umkc.instructure.com/courses/65702/assignments/279216)	due by 11:59pm
	📝 **Quiz05, Database security** [(https://umkc.instructure.com/courses/65702/assignments/279251)](https://umkc.instructure.com/courses/65702/assignments/279251)	due by 11:59pm
Fri Feb 19, 2021	📝 **Discuss06a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279229)](https://umkc.instructure.com/courses/65702/assignments/279229)	due by 11:59pm
	📝 **Discuss06b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279215)](https://umkc.instructure.com/courses/65702/assignments/279215)	due by 11:59pm
	📝 **Hw06a, Practice with null values** [(https://umkc.instructure.com/courses/65702/assignments/279239)](https://umkc.instructure.com/courses/65702/assignments/279239)	due by 11:59pm
	📝 **Quiz06, Null values** [(https://umkc.instructure.com/courses/65702/assignments/279252)](https://umkc.instructure.com/courses/65702/assignments/279252)	due by 11:59pm
	📝 **Quiz06a, Null values** [(https://umkc.instructure.com/courses/65702/assignments/279203)](https://umkc.instructure.com/courses/65702/assignments/279203)	due by 11:59pm
Fri Feb 26, 2021	📝 **Discuss07a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279231)](https://umkc.instructure.com/courses/65702/assignments/279231)	due by 11:59pm
	📝 **Discuss07b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279213)](https://umkc.instructure.com/courses/65702/assignments/279213)	due by 11:59pm

Date	Details	
	📝 **Hw07a, Practice with Single Row Functions** [(https://umkc.instructure.com/courses/65702/assignments/279240)](https://umkc.instructure.com/courses/65702/assignments/279240)	due by 11:59pm
	📝 **Quiz07a, Single Row Functions** [(https://umkc.instructure.com/courses/65702/assignments/279198)](https://umkc.instructure.com/courses/65702/assignments/279198)	due by 11:59pm
	📝 **Quiz07b, Date Functions** [(https://umkc.instructure.com/courses/65702/assignments/279200)](https://umkc.instructure.com/courses/65702/assignments/279200)	due by 11:59pm
	📝 **Quiz07c, General functions** [(https://umkc.instructure.com/courses/65702/assignments/279202)](https://umkc.instructure.com/courses/65702/assignments/279202)	due by 11:59pm
Fri Mar 5, 2021	📝 **Discuss08a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279230)](https://umkc.instructure.com/courses/65702/assignments/279230)	due by 11:59pm
	📝 **Discuss08b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279214)](https://umkc.instructure.com/courses/65702/assignments/279214)	due by 11:59pm
	📝 **Hw08a, Practice with statistical summaries** [(https://umkc.instructure.com/courses/65702/assignments/279241)](https://umkc.instructure.com/courses/65702/assignments/279241)	due by 11:59pm
	📝 **Quiz08a, Statistical summary functions** [(https://umkc.instructure.com/courses/65702/assignments/279206)](https://umkc.instructure.com/courses/65702/assignments/279206)	due by 11:59pm
Fri Mar 12, 2021	📝 **Discuss09a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279222)](https://umkc.instructure.com/courses/65702/assignments/279222)	due by 11:59pm
	📝 **Hw09a, Conversion Functions and Conditional Expressions** [(https://umkc.instructure.com/courses/65702/assignments/279242)](https://umkc.instructure.com/courses/65702/assignments/279242)	due by 11:59pm
	📝 **Quiz09a, Conversion Functions and Conditional Expressions** [(https://umkc.instructure.com/courses/65702/assignments/279201)](https://umkc.instructure.com/courses/65702/assignments/279201)	due by 11:59pm
Fri Mar 19, 2021	📝 **Discuss10a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279232)](https://umkc.instructure.com/courses/65702/assignments/279232)	due by 11:59pm

Date	Details	
	▧ **Hw10a, Metadata for databases with more than one table** [(https://umkc.instructure.com/courses/65702/assignments/279243)](https://umkc.instructure.com/courses/65702/assignments/279243)	due by 11:59pm
	▧ **Discuss11a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279233)](https://umkc.instructure.com/courses/65702/assignments/279233)	due by 11:59pm
Fri Mar 26, 2021	▧ **Hw11a, Use the acupuncture for headache database** [(https://umkc.instructure.com/courses/65702/assignments/279244)](https://umkc.instructure.com/courses/65702/assignments/279244)	due by 11:59pm
	▧ **Quiz11a Retrieving data from multiple tables** [(https://umkc.instructure.com/courses/65702/assignments/279204)](https://umkc.instructure.com/courses/65702/assignments/279204)	due by 11:59pm
	▧ **(Optional) Discuss12b: Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279212)](https://umkc.instructure.com/courses/65702/assignments/279212)	due by 11:59pm
	▧ **Discuss12a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279221)](https://umkc.instructure.com/courses/65702/assignments/279221)	due by 11:59pm
Fri Apr 2, 2021	▧ **Hw12a on displaying data from multiple tables** [(https://umkc.instructure.com/courses/65702/assignments/279245)](https://umkc.instructure.com/courses/65702/assignments/279245)	due by 11:59pm
	▧ **Hw12a Retreiving data from multiple tables** [(https://umkc.instructure.com/courses/65702/assignments/279246)](https://umkc.instructure.com/courses/65702/assignments/279246)	due by 11:59pm
	▧ **Quiz12 on displaying data from multiple tables** [(https://umkc.instructure.com/courses/65702/assignments/279207)](https://umkc.instructure.com/courses/65702/assignments/279207)	due by 11:59pm
	▧ **(Optional) Discuss13b. Review this week's readings** [(https://umkc.instructure.com/courses/65702/assignments/279211)](https://umkc.instructure.com/courses/65702/assignments/279211)	due by 11:59pm
Fri Apr 9, 2021	▧ **Discuss13a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279234)](https://umkc.instructure.com/courses/65702/assignments/279234)	due by 11:59pm
	▧ **Hw13, Handing mismatches** [(https://umkc.instructure.com/courses/65702/assignments/279247)](https://umkc.instructure.com/courses/65702/assignments/279247)	due by 11:59pm

Date	Details	
Fri Apr 16, 2021	📝 **Discuss14a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279220)](https://umkc.instructure.com/courses/65702/assignments/279220)	due by 11:59pm
	📝 **Hw14 - Using Set Operators** [(https://umkc.instructure.com/courses/65702/assignments/279248)](https://umkc.instructure.com/courses/65702/assignments/279248)	due by 11:59pm
	📝 **Quiz14 - Using Set Operators** [(https://umkc.instructure.com/courses/65702/assignments/279208)](https://umkc.instructure.com/courses/65702/assignments/279208)	due by 11:59pm
Fri Apr 23, 2021	📝 **Discuss15a, One minute feedback** [(https://umkc.instructure.com/courses/65702/assignments/279219)](https://umkc.instructure.com/courses/65702/assignments/279219)	due by 11:59pm
	📝 **Hw15 - Using Subqueries** [(https://umkc.instructure.com/courses/65702/assignments/279249)](https://umkc.instructure.com/courses/65702/assignments/279249)	due by 11:59pm
	📝 **Quiz15 - Using subqueries** [(https://umkc.instructure.com/courses/65702/assignments/279197)](https://umkc.instructure.com/courses/65702/assignments/279197)	due by 11:59pm
Fri May 7, 2021	📝 **Final Exam** [(https://umkc.instructure.com/courses/65702/assignments/279205)](https://umkc.instructure.com/courses/65702/assignments/279205)	due by 11:59pm