

# CS 374: Database Systems

James Madison University, Spring 2022 Semester, 3 Credits

Website:

<http://w3.cs.jmu.edu/mayfiecs/cs374>

Class Times:

Section 3: Tu/Th, 9:35 AM – 10:50 AM

Location:

EnGeo 2209

Prerequisite:

C- or better in either CS 240 or CS 345



## Your Instructor



Dr. Chris Mayfield ([mayfiecs@jmu.edu](mailto:mayfiecs@jmu.edu))

Office: ISAT/CS 208 Phone: 540-568-3314

*Note: The best way to contact me is by email or direct message.*

Office Hours:

M/W/F, 2:20 PM – 4:00 PM  
and other times by appointment

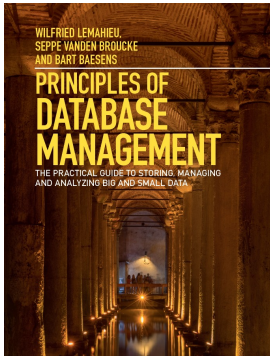
## Goals and Objectives

By the end of this course, you should be able to:

- Summarize features of the relational model including structured data, relational operations, and integrity constraints.
- Construct a conceptual model (E/R diagram) and a physical model (relational design) from a general data description.
- Illustrate anomalies and inconsistencies that can occur within a database design and how to correct them.
- Write analytical queries in SQL (select, project, inner/outer join, grouping, aggregation, sorting, distinct, subqueries).
- Design and implement a substantial three-tier application, both individually and with others.
- Manage a successful semester-long team project (communication, source control, frequent code reviews).

Last but not least, you should have fun exploring and working with several exciting database technologies this semester!

## Required Textbook



Wilfried Lemahieu, Seppe vanden Broucke, and Bart Baesens (2018). *Principles of Database Management*. Cambridge University Press, United Kingdom. ISBN: 9781107186125.

<http://www.pdbmbook.com/>

<https://www.cambridge.org/9781107186125>

“This comprehensive textbook teaches the fundamentals of database design, modeling, systems, data storage, and the evolving world of data warehousing, governance and more.”

We will mainly study chapters 1–3 (fundamentals), 6–7 (relational/SQL), 10–11 (XML/NoSQL), 15 (applications), and 19 (big data). A [detailed schedule](#) with readings and assignment due dates will be maintained on the course website as the semester progresses. You are strongly encouraged to read the textbook and other assigned readings, even if some material is not covered in class.

The [pdbmbook.com](http://pdbmbook.com) site includes video lectures for each chapter, a playground environment for writing queries, and multiple choice quizzes based on questions included in the book.

## Course Culture

Please help us maintain a collaborative learning environment that encourages questions, provides opportunities for significant learning, and actively involves everyone in discussions.

## Professional Conduct

The ACM Code of Ethics and Professional Conduct (<https://www.acm.org/code-of-ethics>) forbids discrimination and harassment of all types. If you feel someone is violating these principles (e.g., by making inappropriate or demeaning remarks), it is your responsibility to take action by informing me or, if you feel comfortable doing so, addressing the individual directly. I will do my best to preserve your confidentiality while addressing the issue.

## Diversity and Inclusion

Learning environments should be built on mutual respect and support a diversity of thoughts, perspectives, experiences, and identities. Please advise me regarding any concerns or personal circumstances (including your name’s proper pronunciation, any name or pronouns not reflected on MyMadison, or significant extracurricular commitments) that might be relevant to your full participation in this course.

## Academic Honesty

Students who violate the Honor Code (<http://www.jmu.edu/honorcode/code.shtml>) will receive a reduced or failing grade *in the course*. Other penalties may be imposed, and all violations will be reported to the Honor Council. Automated tools may be used on any assignment, at any time, to detect inappropriate collaboration and to determine the originality of submissions.

# Methods of Evaluation

## Assignments

To help prepare you for the exams, we will have seven individual assignments. Some of them will be based on textbook exercises, and others will help you develop skills for completing the group project. Written homework must be submitted electronically via Canvas.

*Note: I generally will not provide assistance between Friday at 5:00 PM and Monday at 8:00 AM. If you choose to start homework at the last minute, you might be on your own. I will respond to communications sent over the weekend on Monday morning.*

## Group Project

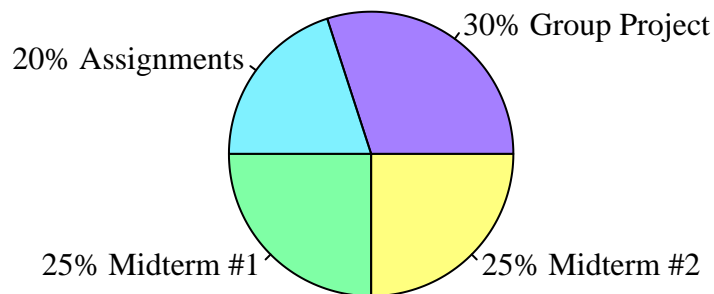
Throughout the semester, you will work in a group of four students to design, implement, and demonstrate a web application that uses a database management system. You are free to choose your own group members or have them assigned by the instructor. The project will require six deliverables, two performance evaluations, and a final code review with the instructor.

## Midterm Exams

We will have midterms during the 7th and 14th week of the semester. Each exam will consist of two parts: one for written problems, and one for programming. If you must be absent during an exam for a legitimate reason, please contact me *at least one week* beforehand to make special arrangements. Some portion of the exams may be given asynchronously.

## Grading Details

Your grade in CS 374 will be based on:



Letter grades will be assigned on the scale A=90–100, B=80–89, C=70–79, D=60–69, F=0–59, with potential minor adjustments after considering the overall performance of the class and actual distribution of numeric scores. I will use “+” and “-” grades at my discretion. I do not assign WP or WF grades except in extreme circumstances.

## Late Work Policy

Deadlines exist so that I can release homework solutions promptly. Therefore, late work will not be accepted without special permission. I am willing to work with you if your circumstances suddenly change (e.g., if you or family members become hospitalized).

## University Requirements

### Adding/Dropping

You are responsible for enrolling in courses and verifying your schedule on MyMadison. The last day to add a semester course is Monday, 02/07/2022 (permission required after Friday, 01/28/2022). The last day to withdraw from a course with a W grade is Friday, 03/25/2022.

### Attendance Policy

You are expected to participate in every class, either in person or remotely. I understand that things come up, and you might need to be absent occasionally. Don't ask if you "missed anything important"—every class is important. If you are not feeling well or suspect you might be sick, please stay at home!

### Disability Services

If you have a documented disability and need accommodations in this course, please register with the Office of Disability Services (<http://www.jmu.edu/ods>, Student Success Center, Room 1202, 540-568-6705). They will provide you with an Access Plan Letter to verify your need for services and make recommendations for the course. I will be happy to discuss your access plan with you.

### Excused Absences

Students who are unable to attend class due to JMU sponsored activities (such as sports, band, academic competition, field trips, etc.) or personal religious observances may request reasonable accommodations. Please notify me during the first week of class regarding potential absences so that we can determine alternative methods for you to complete the required work.

### University Closings

For severe weather and other unexpected circumstances, watch for announcements relating to make-up dates. See <http://www.jmu.edu/JMUpolicy/1309.shtml> for JMU's cancellation policy. Although the schedule may adapt to canceled classes, assignment deadlines generally do not change.

### Your Well-Being

As a university student, there may be times when personal stressors interfere with your academic performance and/or negatively impact your daily life. If you or someone you know is experiencing mental health challenges at James Madison University, please connect with the Counseling Center located within the Student Success Center on the 3rd floor. You can learn more about available services by visiting <https://www.jmu.edu/counselingctr> or calling 540-568-6552. Their services are free and confidential. Other available support resources to consider include, but are not limited to, the Office of the Dean of Students, the Health Center, and Learning Strategies Instruction.