

Course Code/Title: CSCI 403 – Database Management
Semester/Year: Spring 2019
Credit Hours: 3
Pre-requisites: CSCI 262 with a grade of C- or higher or similar

Class meeting times/locations:

Section A: MWF 10:00 – 10:50, BE 108
Section B: MWF 1:00 – 1:50, BB W210

Instructor: Christopher Painter-Wakefield
Email: cpainter@mines.edu
Office Phone: 303-273-3717
Office Location: BB 280N
Office Hours: TBA

Links

- **Course website:** <http://cs-courses.mines.edu/csci403/spring2019/>
- **Canvas:** <https://elearning.mines.edu/login/saml>
- **Piazza:** <https://piazza.com/mines/spring2019/csci403>

Course Description

This course is all about the construction, design, and use of databases. We will primarily focus on relational (SQL) databases, although we will briefly touch on NoSQL databases and Big Data systems. A brief list of topics:

- Entity-Relationship models and diagrams
- The relational database model
- Relational algebra
- SQL queries and DDL
- Programming applications against SQL databases
- NoSQL and Big Data

Required Text

Fundamentals of Database Systems (7th Edition) by Elmasri & Navathe, available at the campus bookstore.

Required Technology: none; you may use your own laptop if preferred/convenient, but all campus computer labs should have the capabilities/software needed.

Learning Outcomes

At the completion of the course, you will be able to:

1. Construct a data model using the Entity-Relationship model.
2. Design a relational database schema implementing a data model, including tables, indexes, and constraints; analyze functional dependencies and normalize a relational database schema.
3. Understand and explain basic relational algebra operations and manipulations.
4. Construct retrieval and update queries in SQL; apply transaction control for complex updates; tune queries for performance.
5. Build applications using a relational database in Python or Java.

Assessments

The assessments for this course include the following:

- 9 – 10 projects of varying complexity, mostly involving writing queries against the course database
- 3 – 4 quizzes
- Midterm exam

Grading Policy

The majority of the grade will be based on short projects based on the various topics of the course. There will be several quizzes leading up to a midterm exam covering roughly the first three quarters of the semester. There will be no final exam.

Grading will be done on an absolute, but adjustable scale. This means that there is no curve. Anyone earning 90% or more of the total number of points available will receive a grade of A; 80% or higher a B, etc. This scale may go down, but it will not go up.

All grades will be posted in Blackboard.

- Projects: 60%
- Quizzes: 15%
- Midterm: 25%

Late Policy: Late work is *strongly* discouraged. Assignments turned in after the deadline will be subject to a 10% penalty per week - so after the deadline and up to 1 week past the deadline, the penalty is 10%, the following week 20%, and so forth.

Coursework Return Policy

Homeworks and exams will be graded and returned as quickly as possible, generally within two weeks.

Expectations for Participation

You are expected to engage in all course activities, tasks, and assignment as an emerging professional. You are expected to spend between 4 and 6 hours on this course each week during out-of-class time, in addition to actively participating during the class-time each week.

Learning Environment

Below you can find some "official" language from Mines on similar topics, but I also want to share my own views regarding the learning environment as it relates to my course, both in and out of the classroom.

Fundamentally, I expect and require respect in this course for yourself, your classmates, and your instructors and TAs.

- Respect for yourself includes taking care of yourself physically and mentally and advocating for an environment that facilitates learning for you.
- Respect for your classmates includes recognizing and appreciating the diversity of backgrounds and experiences of your classmates and making it your interest to foster a learning environment for everyone. Some of your classmates may already be expert programmers, while others may have only just begun to learn; all are welcome.
- Respect for your instructors (as well as your classmates) includes not participating in disruptive or distracting behavior: talking, playing games, or web surfing during lecture, for instance, make it difficult for others to focus on the reason we are all here.
- Respect must be mutual to be effective; we (your instructors) and your TAs will be held to the same standards of respect.

It's important to recognize that the rigorous requirements of studying at Mines can cause stress, which sometimes results in distressed or disruptive behavior. If you are experiencing issues, or believe that one of your partners or teammates is, please SPEAK UP. Feel free to come talk to your instructor, or visit <https://www.mines.edu/student-life/care/>. For serious violations of school policies, also see <https://www.mines.edu/speak-up/>.

Diversity and Inclusion:

At Colorado School of Mines, we understand that a diverse and inclusive learning environment inspires creativity and innovation, which are essential to the engineering process. We also know that in order to address current and emerging national and global challenges, it is important to learn with and from people who have different backgrounds, thoughts, and experiences.

Our students represent every state in the nation and more than 90 countries around the world, and we continue to make progress in the areas of diversity and inclusion by providing [Diversity and Inclusion programs and services](#) to support these efforts.

Students with Disabilities:

The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me. Students with disabilities may also wish to contact Disability Support Services (DSS) to discuss options to removing barriers in this course, including how to register and request official accommodations. Please visit their website at disabilities.mines.edu for contact and additional information. If you have already been approved for accommodations through DSS, please meet with me at your earliest convenience so we can discuss your needs in this course.

Accessibility within Canvas:

Read the [Accessibility Statement](#) from Canvas to see how the learning management system at the Colorado School of Mines is committed to providing a system that is usable by everyone. The Canvas platform was built using the most modern HTML and CSS technologies, and is committed to W3C's Web Accessibility Initiative and Section 508 guidelines.

Discrimination, Harassment, and Title IX:

All learning opportunities at Mines, including this course, require a safe environment for everyone to be productive and able to share and learn without fear of discrimination or harassment. Mines' core values of respect, diversity, compassion, and collaboration will be honored in this course, and the standards in this class are the same as those expected in any professional work environment. (More information can be [found here](#).)

Discrimination or harassment of any type will not be tolerated. As a participant in this course, we expect you to respect your instructor and your classmates. As your instructor, it is my responsibility to foster a learning environment that supports diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

- Course rosters are provided to the instructor with the student's legal name. I will honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records.
- If something is said or done in this course (by anyone, including myself) that made you or others feel uncomfortable, or if your performance in the course is being impacted by your experiences outside of the course, please report it to:
 - Me (if you are comfortable doing so)
 - Wellness Center- [Counseling](https://www.mines.edu/counseling-center/) (<https://www.mines.edu/counseling-center/>)
 - [Speak Up](https://www.mines.edu/speak-up/) (<https://www.mines.edu/speak-up/>) – Anonymous Option

In this course, we will cultivate a community that supports survivors, prevents interpersonal violence, and promotes a harassment free environment. Title IX and Colorado State law protects individuals from discrimination based on sex and gender in educational programs and activities. Mines takes this obligation seriously and is

committed to providing a campus community free from gender and sex-based discrimination. Discrimination, including sexual harassment, sexual violence, stalking, and domestic violence, is prohibited and will not be tolerated within the Mines campus community. If these issues have affected you or someone you know, you can access the appropriate resources on the [Mines Title IX website](#). You can also contact the Mines Title IX Coordinator, Camille Torres, at 303.384.2124 or titleix@mines.edu for more information.

It's on us, all of the Mines community, to engineer a culture of respect.

CARE @ Mines:

If you feel overwhelmed, anxious, depressed, distressed, mentally or physically unhealthy, or concerned about your wellbeing overall, there are resources both on- and off-campus available to you. If you need assistance, please ask for help from a trusted faculty or staff member, fellow student, or any of the resources below. As a community of care, we can help one another get through difficult times. If you need help, reach out. If you are concerned for another student, offer assistance and/or ask for help on their behalf. Students seeking resources for themselves or others should visit <https://www.mines.edu/student-life/care/>.

Additional suggestions for referrals for support, depending on comfort level and needs include:

- [CARE at Mines](#) (care.mines.edu)– for various resources and options, or to submit an online “CARE report” about someone you’re concerned about (email care@mines.edu)
- [CASA](#) (<https://www.mines.edu/casa>) – for academic advising, tutoring, academic support, and academic workshops
- [Counseling Center](#) (<https://www.mines.edu/counseling-center/>)– for students to call 303-273-3377 for an appointment. There are also online resources for students on the website. Located in the Wellness Center 2nd floor at 1770 Elm St.
- [Health Center](#) (<https://www.mines.edu/student-health/>) – students may call 303-273-3381 for appointment. Located in Wellness Center 1st floor at 1770 Elm St.
- [Colorado Crisis Services](#) (<http://coloradocrisiservices.org>) – for crisis support 24/7, either by phone, text, or in person. Colorado Crisis Services is a great confidential resource, available to anyone by calling 1-844-493-8255, or texting “TALK” to 38255. Walk-in location addresses are posted on the website.

All of these options are available for free for students. The Counseling Center, Health Center, and Colorado Crisis Services are confidential resources. The Counseling Center will also make referrals to off-campus counselors, if preferred.

In an emergency, you should call 911, and they will dispatch a Mines or Golden PD officer to assist.

Absence Policy:

The [Student Absences](#) webpage outlines CSM's policy regarding student absences. It contains information and documents to obtain excused absences.

Note: All absences that are not documented as excused absences are considered unexcused absences. Faculty members may deny a student the opportunity to make up some or all of the work missed due to unexcused absence(s). However, the faculty members do have the discretion to grant a student permission to make up any missed academic work for an unexcused absence. The faculty member may consider the student's class performance, as well as their attendance, in the decision.

In the case of an absence, the student is responsible for determining what work was missed and for putting forth a good faith effort to review the material on their own.

Policy on Academic Integrity/Misconduct:

The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy can be found in the [Mines' Policy Library](#).

Collaboration Policy for Programming Projects in CS Courses

The following policy exists for all CS courses. This policy is a minimum standard; your instructor may decide to augment this policy.

1. If the project is an individual effort project, you are not allowed to give code you have developed to another student or use code provided by another student. If the project is a group project, you are only allowed to share code with your group members.
1. You are encouraged to discuss programming projects with other students in the class, as long as the following rules are followed:
 - a. You view another student's code only for the purpose of offering/receiving debugging assistance. Students can only give advice on what problems to look for; they cannot debug your code for you. All changes to your code must be made by you.
 - b. Your discussion is subject to the empty hands policy, which means you leave the discussion without any record [electronic, mechanical or otherwise] of the discussion.
2. Any material from any outside source such as books, projects, and in particular, from the Web, should be properly referenced and should only be used if specifically allowed for the assignment.

All issues of misconduct are reported to the Dean of Students.

Instructor's Addendum:

As an addendum to this policy, you are required to submit a README file with every project (except as noted). The README should list every person (other than the instructor or a TA) who assisted you in some way on the assignment. The README is also the place to give appropriate credit to any outside source that contributed to your submission.